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in German Child Language

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Language Acquisition

Constraints on Parameter Setting: A Grammatical Analysis of Some Acquisition Stages in German Child Language

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In the first part of this article, it is argued that in order to improve the parameter model as a theory of acquisition it has to be constrained in several ways. Three constraints are discussed that restrict the class of possible parameters and the way they are fixed in development. In the second part, empirical results on the acquisition of subject-verb agreement, verb placement, empty subjects, and negation in German child language are presented. I suggest a grammatical analysis for these data (in terms of the Split-Infl Hypothesis) that allows us to maintain the learnability constraints from the beginning.

1. SOME NOTES ON PARAMETER THEORY

The idea that the acquisition of grammatical structure in child development is guided by a set of abstract principles and parameters of Universal Grammar (UG; see Chomsky, 1981) has stimulated much theoretical and empirical research on child language. This holds in particular for the so-called parameter theory of language acquisition (Hyams, 1986; Roeper & Williams, 1987; among others). Originally, the parameter theory was developed to account for the variation among languages. The idea was that at least some of the variation is determined by a set of options defined by UG itself (Rizzi, 1982). In this view, general principles, such as move alpha or subadjacency, do not hold directly and invariantly. Rather, variables in their definition are filled in by specific values of individual languages. Thus,

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for instance, subadjacency is defined in terms of bounding nodes, but what counts as a bounding node varies from language to language. Similarly, move alpha defines the possibility of movement, but what actually moves is determined according to the language.

Parameter theory has led generative grammarians to reconceptualize their views on acquisition. The basic claim is that the learning device of the child contains (a) a set of stable UG principles that hold for every language, such as the Empty Category Principle and the Case Filter and (b) a set of options or UG parameters, which have to be filled in by experience. UG parameters are said to guide the acquisition process by making available a number of options to the learner. Thus, the language learner no longer has to compose and evaluate sets of grammatical rules as was assumed in Chomsky's idealized model of language acquisition (Chomsky, 1965). Rather, the child simply has to fix the values of the open parameters already available to him or her from UG. In the parameterized model, the task of the language learner is to find those elements and properties in the linguistic input that serve as triggers for setting a particular UG parameter at the appropriate value. Moreover, in the framework of the parameter model, attempts have been made to account for (a) the initial prelinguistic state characterized by UG, (b) the final steady state characterized by a specific target-language grammar, and (c) the intermediate stages that have been observed in the child's real-time development of language (see Borer & Wexler, 1987; Hyams, 1986; among others). Consequently, the idea of UG parameters has led to more realistic models of language acquisition.

However, as pointed out by Valian (1989), the current version of the parameter-setting model still does not match the way the child arrives at his or her final grammar. Valian chose null-subject phenomena to illustrate her claim, pointing out that the input the child receives about null subjects can be contradictory. Thus, even in non-pro-drop languages, such as English and German, the child will sometimes hear tensed sentences without overt subjects (*Seems that Jane loves Mary*; see Valian, 1989). Given exposure to such data in the input, the child learning English could reset the Null-Subject Parameter for the incorrect value. As a result, the child would expect sentences without subjects. However, given the many sentences with subjects in the input, the child will switch back to the correct value. Upon hearing the next subjectless sentence, the child could again change the parameter to the incorrect value. This cycle could repeat itself in an infinite loop, and the child would never settle on the correct value for that language (see Valian, 1989).

Valian mentioned that the problem she was dealing with only holds for parameters where the two values are in a nested relationship, such as the Null-Subject Parameter. I think that it is a more general problem that might possibly hold for all sorts of parameters, including those where the two values are completely disjoint, such as the Head-Direction Parameters.

Consider the position of the head of verb phrases (VPs) in German. First, the child might hear sentences with nonfinite verbs in clause-final position, as is generally the case in German. As a consequence, the child would fix the parameter at the correct value. However, the input also contains many sentences with the verb appearing before the complements, as is common for finite verbs in main clauses. Assuming that, at least in the early stages, the child cannot clearly distinguish between finite and nonfinite verbs, sentences with postverbal complements could lead the child to switch the head parameter for the VP to the incorrect value. So, again there is a case where, from the perspective of the child, the input appears to be contradictory.

These problems have to do with the fact that UG parameters are too powerful in terms of learning devices. There is no principle or constraint in parameter theory that prohibits switching back and forth between the values of a given parameter. What is required to set a parameter is positive evidence from the input. However, if the input is contradictory in the sense just mentioned, the learner will run into what might be called the pendulum problem (Randall, in press), swinging from one value to another and never settling on the correct grammar.¹ In this way, parametric theory allows for sequences of development that do not match the acquisition data. For example, it is clear from the studies on German child language that, even in the early stages, the child does not constantly switch the value of the head parameter for the VP (see Clahsen, 1982). The same holds for the Null-Subject Parameter. What we get from the acquisition data is that rather than switching between different values, the parameter setting is *inert* in several respects. Occasional errors made by children do not result in the switching of parameter values. Additionally, the child seems to require a certain amount of positive evidence to fix a parameter at a particular value. Therefore, in order to improve the parameter model as a theory of acquisition, it has to be constrained in several ways.

In the next section, I discuss some proposals for a more constrained version of parameter theory. In the second part of the article, I present a grammatical analysis of some acquisition stages in German child language within this framework.

2. THREE CONSTRAINTS ON PARAMETER SETTING

In the following, I discuss the three constraints listed in (1) and some consequences they have for language acquisition:

¹Randall (in press) discussed the pendulum problem with respect to overgeneralizations of lexical items, such as **broken*, **foots*, and so on. I think that a similar problem exists in the development of syntax.

- (1) a. Parameters can only refer to heads or properties of heads (*parameterization constraint*).
- b. Fixed parameters cannot be reset (*parameter-setting constraint*).
- c. UG parameters do not mature (*continuity constraint*).

Whereas (1a) restricts the format of UG parameters, (1b) and (1c) are constraints on the development of parameters and parameter fixation. (1b) determines that parameter *resetting* is not possible during language development, and (1c) requires that all UG parameters are present even at the earliest stage of child language development. Notice that these constraints are taken as null hypotheses that should not be rejected until the data leave no other choice. In this way, they can be used as guidelines for analyzing child language development within the parameter-setting model.

2.1 Parameterization Constraint

The first constraint is based on Chomsky (1989), where he pointed out, taking up previous work by Borer (1984), that parameters of UG should not relate to the computational system, but only to the lexicon. The idea is to restrict the class of possible parameters to those that refer to categories of lexical items or to properties of lexical items, for example, canonical government (Chomsky, 1989, p. 44). As a result, the syntax of a particular language could be determined by the acquisition of the lexicon. This proposal introduces a strong restriction on possible UG parameters.

Moreover, the constraint restricts the child's triggering experience, that is, the evidence the child needs to fix a parameter. Rizzi (1989) pointed out that if the space available for parameterization is indeed restricted to properties of heads (as in (1a)), then it is natural to expect that the amount of structure that needs to be inspected by the child will not exceed the sphere of influence of a head, namely its government domain. In this way, (1a) puts a restriction on the search space for parameter fixing. Rizzi argued that special principles for constraining the child's triggering experience, in particular Lightfoot's (1989) degree-0 learnability, are not required.

The parameterization constraint does not allow purely syntactic parameters. Consider, for example, the original version of the principle of subadjacency (Chomsky, 1973)

- (2) In a configuration $X \dots [{}_a \dots [{}_b \dots Y]]$, no rule may involve X and Y . ($a, b = \{NP, IP, (CP) \dots\}$)

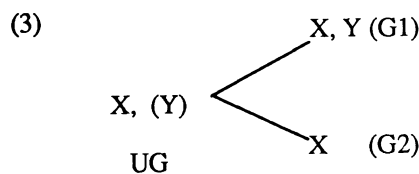
Subadjacency was defined universally in terms of bounding nodes (a, b in (2)), and what counted as a bounding node varied from language to language. In

this way, differences between, for example, English and Italian in terms of extraction of *wh*-phrases out of *that*-clauses could be accounted for. However, the parameterized elements in the definition of subadjacency (i.e., *a* and *b* in (2)) are syntactic categories. That is, the original version of subadjacency does not match the constraint in (1a) and has had to be revised (see Chomsky, 1986, and subsequent work). In general, the parameterization constraint prevents us from simply renaming former syntactic transformations as UG parameters. In this way, (1a) imposes a restriction on the class of possible parameters. Whether (1a) is correct as an empirical claim, meaning that all the syntactic differences can be traced back to lexical properties, remains to be seen.²

In any case, the parameterization constraint does not solve the pendulum problem. Even if all parameters referred to lexical categories, this would not exclude the possibility that—due to contradictory input, for example—the learner might swing from one parameter value to the other. For this reason, additional constraints are necessary.

2.2 Parameter-Setting Constraint

The second constraint (1b), that parameters cannot be reset, goes back to Lebeaux's idea that children have recourse to default settings of UG parameters during language development. Lebeaux (1988, p. 159) explored the consequences of this idea for the parameter-setting model. He proposed the following general format of parameters, where G1 and G2 are possible target values, that is, adult grammars, *X* and *Y* are parameter values, *X* being the default, and *Y* (if present in a particular grammar) overrides ("bleeds") *X*:



Lebeaux argued that as long as the target value of a parameter has not been set, the child takes the default *as a default*. This implies that the remaining options are still available. However, once a parametric setting (consistent with the available input) has been chosen by the child, the remaining

²Bickerton (1989) made similar claims for acquisition and applied this framework to explain the genesis of creole languages.

unexercised options are no longer accessible. Therefore, parameter resetting is not possible during development.

Lebeaux pointed out that assuming default settings to be accessible to children gives a different view of parameter setting than is conventionally understood. Under the standard parameter-setting view, a parameter is something like a cognitive switch, where each position is stable and the setting of the switch may change during development. Under Lebeaux's view, a parameter is more like a hill to be climbed, like a target of the system. Rather than the child first fixing the parameter at a particular value and later switching to the actual one, the child has the actual value during the whole developmental process. Lebeaux stressed that this view of parameter setting is in line with the general framework that has been set forth by Chomsky (1978) and Fodor (1981) with respect to the nature of learning. "Learning" in this view involves the erasure of information specified in UG. Thus, if (3) is fixed at the value of G1, the parentheses surrounding *Y* in the UG specification are erased. This means that, due to the bleeding relation between *X* and *Y*, *Y* exists in G1. The grammar G2 contains even less information, because *Y* has been erased altogether. Thus, the original setting of the parameter is neither of the final two settings.³

The parameter-setting constraint is also compatible with a more general guideline for theories of children's language, namely with the *learnability condition* proposed by Pinker (1984, p. 5). It says that children's abilities at any stage of development should be viewed as a way station in a process that takes them from a stage at which they know nothing about the target language to one at which they have acquired the language completely. More specifically, we might assume that children steadily converge on the adult grammar without remissions to earlier stages. Thus, it is required that (unless there is empirical evidence to the contrary) the child does not vacillate among various settings of a parameter in response to conflicting evidence concerning that parameter's value. In this way, the pendulum problem (i.e., the child switching parameter values back and forth) is obviated.

Consider as an example of the use of the parameter-setting constraint the development of pronouns and reflexives in early child language. In several acquisition studies (summarized in Solan, 1987), it has been found that in some early stages of development, sentences with pronouns are more

³Notice that Lebeaux's view of parameter setting presupposes a specific structure of parameters. In particular, a default value must exist to fall into, as long as the target value has not been fixed. It remains to be seen whether all UG parameters have default values and whether all parameters can be traced back to the general format in (3). Moreover, it is unclear whether parameter fixation actually involves processes such as erasing parentheses of UG specifications or whether Lebeaux's format (3) should be taken in a more abstract way. Answering these questions is beyond the scope of the present article.

difficult to interpret than those with reflexives. The children in these studies seemed to interpret sentences with pronouns as though they contained reflexives. Moreover, Solan found that the children made more mistakes in infinitival than in tensed complements. Whereas in tensed clauses, such as *The dog said that the horse hit himself*, the children interpreted the reflexive correctly, in infinitivals, such as *The dog told the horse to hit himself*, they construed the reflexive with the dog, that is, with an antecedent external to the domain in which the reflexive should be bound in English. In Icelandic, however, reflexives can be nonlocally bound across infinitivals. Based on this, Solan discussed the possibility that the children are initially choosing the parameter setting of Icelandic. This would mean that they have correctly classified the elements as reflexives but still have to reset the parameters of the domains for principles A and B of the binding theory at the correct values. Solan gave empirical evidence against this interpretation. Notice that such an analysis would also be excluded under the parameter-setting constraint, because the constraint does not allow for accounts in which the children occasionally misset parameters and subsequently have to reset them within the array of original options.

2.3 Continuity Constraint

The third constraint is an application of Pinker's (1984) Continuity Hypothesis to parameter theory. The Continuity Hypothesis requires that the learning device does not change over time and does not generate developmental patterns of errors that are impossible in natural language. The constraint is theoretically motivated by applying Occam's razor.⁴ This implies that the most explanatory theory will posit the fewest developmental changes in the learning device itself.

The Continuity Hypothesis is in contrast to the view that the principles of UG are ordered in terms of an innately specified maturational schedule. This is the strong version of the Maturation Hypothesis proposed by Felix (1984, 1987). This view is theoretically unrestrictive and does not allow one to decide among various alternative ways to account for the data. Under Felix's account, it is possible, for example, to come up with arbitrary rule systems or utterance templates for early child language that would later be

⁴The Continuity Hypothesis was introduced in connection with the computer metaphor that is one of the basic points of orientation in learnability theory. According to this metaphor, the human brain is conceived of as a computational device for manipulating structural representations, and the language acquisition device is seen as a deterministic input/output system consisting of a set of computational mechanisms that receive positive data as input and produce a cognitive subsystem (i.e., the grammar of a particular language) as output (Chomsky, 1986). Because a learnability account of a given set of language acquisition data must refer to these computational mechanisms, it holds: the fewer the mechanisms, the more parsimonious the theory and the more explanatory its accounts (Pinker, 1984, p. 6).

expunged by virtue of the maturation of new UG principles. That child language development may proceed in such a way cannot be excluded in advance, but the more constrained approach should only be given up if the data force us to do so.

An interesting alternative to the continuity assumption is the weak version of the Maturation Hypothesis (Borer & Wexler, 1987, 1989). According to this proposal, there are UG-external learning constraints that restrict the availability of UG parameters to the child up to a certain stage and are then successively lost due to the process of maturation. This view of maturation differs from the strong Maturation Hypothesis (Felix, 1987) with respect to the question of whether intermediate grammars are inconsistent with UG or not. The strong version assumes inconsistency is possible, particularly at early stages, whereas the weak version (similar to the continuity assumption) assumes that the child's grammar at each stage is consistent with UG. Thus, the constraint that children's grammars are possible grammars is maintained under weak maturation, and, in this regard, there is no difference from the continuity assumption.⁵

In sum, the three constraints under (1) should contribute to developing more restrictive accounts within the parameter-setting model. Now the question is whether we can come up with analyses of the child's real-time growth of language that are compatible with the constraints in (1). Is it possible to describe the development of syntax without assuming syntactic parameters? Concerning the continuity constraint, the question is whether a sequence of observed developmental stages can be described without assuming UG parameters to mature from earlier to later stages. Finally, there is the question of whether intermediate stages of child language

⁵Borer and Wexler (1987) criticized the continuity assumption, because it would lead to a dilemma. The hypothesis, it has been said, does not explain the developmental problem of language acquisition, that is, it does not address the question why some constructions develop before others. Under the continuity assumption, the only possible answer would be that the input the child receives must be strongly ordered, so that the triggering events for constructions that are acquired earlier by the child occur before the triggering events for the constructions that develop later. But it seems unlikely, for conceptual and theoretical reasons, that the input is strongly ordered in this way. Therefore, Borer and Wexler concluded that the Continuity Hypothesis lacks theoretical and empirical justification.

The continuity assumption itself does not solve the developmental problem. Rather, the use of the Continuity Hypothesis is to provide for an external constraint or guideline for descriptions of child language. There are different solutions to the developmental problem under the continuity constraint. One possibility would be that children's sensitivity to the input changes over time, that is, that despite similar inputs at different stages, the children's intake may actually vary. Thus, at the beginning of language development some UG principles, although present latently, must await the child's prior identification of those elements that enter into the principles' triggering conditions (see Pinker, 1984, p. 226). In principle, this could account for observed stages of child language development (see Clahsen, *in press*, and Stevenson, *in press*, for further discussion).

development can be accounted for without allowing for the resetting of parameter values. In the following, these questions are examined with respect to a set of acquisition data from German child language. The rest of the article is structured as follows. First, there is a brief summary of what the grammatical phenomena under investigation look like in the adult language. Second, the acquisition data are described. Third, a grammatical analysis for this set of data is proposed that does not violate any of the constraints in (1). It is tentatively concluded that the three constraints are maintainable but that we need to test them with other kinds of acquisition data.

3. VERB PLACEMENT, NEGATION, AND SUBJECTS IN GERMAN

With regard to the phenomena under investigation, there is an extensive linguistic literature (e.g., Grewendorf, 1990; Haider, 1990). But this literature is not discussed here. Rather, the following remarks are meant as background information for those unfamiliar with the German language.

3.1 Verb Placement

In German, finite verbs occur in the initial, second, or final position of a clause. Consider the following examples:

- (4) a. *Adrian hat gerade das Radio angestellt*
A. has just the radio on turned
'A. has just turned on the radio'.
- b. *Das Radio hat Adrian gerade angestellt*
(= same meaning as (4a))
- c. *Hat Adrian gerade das Radio angestellt?*
Has A. just the radio on turned
'Has A. just turned on the radio?'
- d. *Julia sagte, daß Adrian gerade das Radio anstellte*
J. said that A. just the radio on turned
'J. said that A. just turned on the radio'.

In all cases, the lexical verb occupies clause-final position. In (4d), it is a finite verb in a subordinate clause, whereas in the other examples it is a nonfinite verb. These cases, and the difficulty of formulating a rule that will produce these structures, have led to the hypothesis that the final position is basic and that the cases in which the main verb occurs in a nonfinal position are derived via verb movement (Koster, 1975, among others). In

(4a) and (4b), the finite verb occupies the second position in the sentence. Crucially, this is not always the postsubject position, as is customary in unmarked English clauses of the same type (cf. (4b)). Moreover, it is always a finite verb that appears in second position and it is only in main clauses that it appears there. Finally, we find that in *yes-no* questions (4c) and in imperatives the finite verb is the initial element of the clause.

These observations have given rise to the so-called double-movement analysis (Thiersch, 1978, among others). In nonembedded clauses, the finite verb is moved into the Comp position. This is how we get the initial positions of finite verbs in *yes-no* questions and in imperatives. In addition, we need a rule of topicalization that moves some constituent to the Specifier-of-CP position in declarative sentences. This double-movement analysis assures that the finite verb will always be in a second position in this type of clause. As it is to the Comp position that the finite verb moves, and as this position is filled with a lexical complementizer such as *daß* 'that' in subordinate clauses, the analysis also assures that the verb can move only in main clauses. In this way, the double-movement analysis accounts for all the relevant properties.

3.2 Negation

Let us now turn to negation, with particular reference to the placement of the negator *nicht* 'not' in relation to the verb. As is illustrated in the following examples, the negator may follow (5a, 5b) or precede the finite verb (5c, 5d), and the negator may be adjacent (5b, 5c) to the finite verb or other constituents may intervene (5a, 5d):

- (5) a. *Peter kauft dieses Buch nicht*
Peter buys this book not
'Peter does not buy this book'.
- b. *Peter liest nicht sehr oft*
Peter reads not very often
'Peter does not read very often'.
- c. . . . *daß Peter das Buch nicht kauft*
. . . . that Peter this book not buys
' . . . that Peter does not buy this book'
- d. . . . *daß Peter nicht sehr oft liest*
. . . . that Peter not very often reads
' . . . that Peter does not read very often'.

To a large extent, the position of *nicht* relative to the finite verb is a function of verb movement. This means that the difference between preverbal negation and superficial postverbal negation is due to the fact that

the finite verb has been raised to Comp in (5a) and (5b), whereas in (5c) and (5d) it is still in its underlying position. However, one aspect of the placement of *nicht* does not follow from this aspect alone, namely that the negator is sometimes adjacent to the finite verb and sometimes not. Webelhuth and den Besten (1987) analyzed this contrast by assuming that German allows phrases within VP to “scramble” and adjoin to the left of VP. Consider, as an illustration, the following derivation where (6a) is taken as the underlying structure and (6b) as well as (6c) are derived by scrambling:

- (6) a. . . . *daß er* _{VP} [*nicht* _{VP} [*dem Jungen ein Buch gab*]]
 . . . that he not the boy a book gave
 ‘. . . that he did not give a book to the boy’
 b. . . . _{VP} [_{VP} [*dem Jungen*]_i [*nicht e_i ein Buch gab*]]
 (same as 6a)
 c. . . . _{VP} [_{VP} [*dem Jungen*]_i [*ein Buch*]_j [*nicht e_i e_j gab*]]
 (same as 6a)

3.3 Subjects

Consider, finally, two properties of subjects in German that are studied in the acquisition data: subject agreement and empty subjects.

In German, the grammatical person and the number of the subject are marked on the finite verb. These features are manifested in terms of suffixes and, at times, in terms of changes in the root vowel. Leaving aside morphological irregularities, such as the suppletive forms of *sein* ‘to be’, the distribution of the person/number formatives is as follows:

(7) *Person/number formatives in German*

Ø 1st sg. past tense:	<i>ich leb-te-Ø</i>	‘I live-d’
3rd sg. past tense:	<i>er leb-te-Ø</i>	‘he live-d’
<i>e</i> : 1st sg. present tense:	<i>ich leb-e</i>	‘I live’
<i>st</i> : 2nd sg. present/past:	<i>du leb-st</i>	‘you-Sg.live’
<i>t</i> : 3rd sg. present tense:	<i>er leb-t</i>	‘he live-s’
2nd pl. present/past:	<i>ihr leb-t</i>	‘you-Pl. live’
<i>n</i> : 1st pl. present/past:	<i>wir leb-te-n</i>	‘we live-d’
3rd pl. present past:	<i>sie leb-te-n</i>	‘they live-d’

With respect to empty subjects, we observe the following contrasts:

- (8) a. **daß e kommt*
 that comes

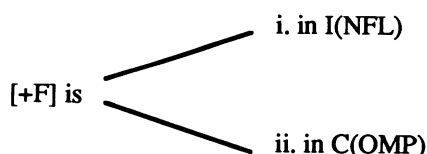
- b. **daß e regnet*
that rains
- c. *daß e mir scheint, . . .*
that to me seems
'that it seems to me'

In (8a), the empty element *e* replaces a referential subject; in (8b), a quasi-argument (Travis, 1984); and in (8c), a nonargument. Similar to English, empty referential subjects as well as empty quasi-arguments are not possible in German. In contrast to English, nonargumental subjects can be empty in German. I rely on Rizzi's (1986) theory of *pro* to analyze the distribution of empty subjects in German (see the following section).

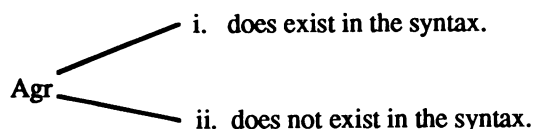
3.4 Parameters

In my analysis of the child language data, the following parameters are particularly relevant:

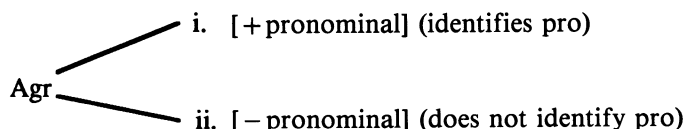
- (9) a. Verb-Second Parameter (Platzack & Holmberg, 1989)



- b. Agr Parameter (Platzack & Holmberg, 1989)



- c. Recovery Parameter (Rizzi, 1986)



The Verb-Second Parameter, which, in the present form is from Platzack and Holmberg (1989), is also assumed in one form or another by many

other authors (e.g., Haider & Prinzhorn, 1986). According to (9a), the finiteness operator [+F] is situated in Infl or in Comp. Platzack and Holmberg saw [+F] as an operator similar to the feature [+wh] in questions, which has to bind an empty category. In all Germanic V2 languages, such as the Scandinavian languages, Dutch, and German, the finiteness operator is situated in C. Furthermore, Platzack and Holmberg proposed a licensing condition on case marking requiring that nominative case has to be governed by [+F]. Thus, similar to Icelandic, the nominative in German is licit if it is governed by [+F]. In order for [+F] to govern nominative case, [+F] has to be lexicalized. There are two ways for the operator [+F] to be lexicalized: It may be realized as a subordinate complementizer, or it may be filled with the finite verb. Platzack and Holmberg concluded that verb movement to C (i.e., the V2 phenomenon) makes C a governor of nominative case in languages where [+F] is in C.

The Agr Parameter (9b) is based on Platzack and Holmberg's analysis of the role of agreement in the Germanic VO languages. They differentiated between mainland and insular Scandinavian languages. In Swedish, Danish, and Norwegian, there is no subject agreement and therefore no Agr phrase in the syntax. In Icelandic, however, there is subject agreement and thus Agr phrases.⁶ The trigger for the setting of this parameter is the type of subject agreement. In languages with person agreement, such as in Icelandic, Agr is in the syntax. In languages without subject agreement or just with number agreement, such as mainland Scandinavian, there are no Agr phrases. I have to assume that the typological claims taken from Platzack and Holmberg (1989) are correct. We can say, then, that in German, as in Icelandic, the Agr Parameter is set on the value (i) in (9b).

The third parameter (9c) is part of Rizzi's (1986) theory of *pro*. According to this theory, empty subjects ("pro" in Rizzi's terminology) have to be licensed and identified (see also Hyams, 1989). Both these conditions are parameterized. The licensing of the empty subject can be accomplished through government by Infl (or some element similar to Infl). In English, Infl does not license, whereas in German it does.

The second condition, identification, involves two parameters. The first offers two choices: (1) person and number features (Φ features in Rizzi's terminology) are used, (2) Φ features are not used (Rizzi, 1986, p. 545). The second parameter is the recovery option mentioned in (9c). This system allowed Rizzi to derive the correct typological distinctions. In languages

⁶Platzack and Holmberg (1989) did not fully adopt the proposal made by Chomsky (1989) and Pollock (1989) that functional categories such as Tense and Agr may have maximal projections in the syntax. Platzack and Holmberg still had an Infl node in the syntax and, with respect to Icelandic, they generated Agr in this node. Combining Platzack and Holmberg's idea of parameterizing the presence of Agr in the syntax with the Chomsky-Pollock analysis gives us two choices: Either Agr phrases are present in the syntax, as in Icelandic and German, or Agr phrases are absent, as in mainland Scandinavian.

such as Chinese, Japanese, and Korean, option (2) is chosen (i.e., Φ features are not used in general). From this it follows that the recovery parameter is vacuous and that any licit occurrence of *pro* is possible in these languages. In contrast, languages that choose option (1) require person and number features to specify *pro*. Here, Universal Grammar offers the two options of the recovery parameter. If Infl (or Agr) has the feature [+ pronominal], the empty argument position can be bound and receives a thematic role. This allows *pro* to be used just like a definite pronoun. Because *pro* can only get features from its governing head, it has to be assumed—according to Rizzi—that Agr is already pronominal in the so-called *pro*-drop languages, such as Italian. In contrast to these languages, German is just like English with respect to the recovery parameter. Both have the value (9cii). Empty referential subjects as in Italian are therefore impossible. In contrast to English, however, nonargumental subjects may be empty in German (see (6c)). Note that, following Rizzi, nonargumental empty subjects do not have to be specified in terms of Φ -features. The difference between English and German is that *pro* is licensed in German but not in English.

4. SOME RESULTS ON GRAMMAR DEVELOPMENT IN GERMAN CHILD LANGUAGE

In the following, I briefly summarize earlier findings from German child language (Clahsen, 1982, 1986b, 1988a). My focus is on four areas of grammatical development: (a) subject agreement, (b) verb placement, (c) empty subjects, and (d) negation. To give an overview of the development, I rely on the profile chart for German child language developed in our research group (Clahsen, 1986a). The profile consists of five developmental phases, ranging from the period when children predominantly use one-word utterances up to the time when embedded clauses occur. For each phase, the profile contains the most typical grammatical structures that have been documented in empirical studies on normal German child language. The profile is based on all the available research studies dealing with the acquisition of German grammar, and we may assume, until evidence to the contrary is available, that the suggested phases represent particular stages of the acquisition of grammar by German children.

The development of the grammatical phenomena under study occurs between phase II and V. As there are only gradual differences between phases II and III (Clahsen, 1986a), we collapse these two phases in the following discussion. In phase IV, we found many changes in the children's language with regard to subject agreement, verb placement, empty subjects,

and negation. The grammar of the children in phase IV comes close to that of the adult language. The focus of the following section is therefore on the contrast between phases II/III and IV. Phase V is only briefly touched upon.

4.1 Phase II/III⁷

In phase II most verbs appear in the stem (-Ø) or the infinitive (-*n*) form. In addition to these forms, all of the children already use the inflection -*t*. None of the forms occurring in phase II are used as agreement markings, and only about half of the -Ø and -*n* forms are correct with respect to agreement. In the remaining instances, overgeneralizations occur.

- (10) a. *hier kann nicht raus* M (2;8)⁸
 here can not out
 (While looking at a picture book, M. points to three children who are shut up in a room and are not coming out.)
- b. *nur pier Julia neid* M (2;9)
 only paper Julia cut
 'Julia is only allowed to cut paper'.
- c. *ich schaufel haben* D (2;10)
 I shovel have
 (D. has the shovel in his hand.)
- d. *fällt um* M (2;2)
 falls over
 (M. wants to jump from the sofa; he stretches out his hand so that his mother will hold on to him.)

⁷In recent studies on early grammar development, it has been proposed that the so-called telegraphic speech of young children is equivalent to adult sentence structure stripped of the functional categories (Lebeaux, 1988; Platzack, 1990; Radford, 1990). This would mean that there are no functional categories in early child grammars. The data currently available on German child language do not provide clear empirical support for this claim. For example, in my longitudinal data it is not possible to clearly identify a stage in the development of syntax that does not have functional elements, such as verb inflections, modal verbs, and so forth. This suggests that at least Infl (or some element similar to Infl) is present in the earliest stage. More research is needed to find out whether there is a syntactic pre-Infl stage in German child language.

⁸The examples are taken from the longitudinal data examined in Clahsen (1982). In that study, a pair of fraternal twins (Daniel and Mathias) and their younger sister (Julia) were regularly observed through video recordings over a period of two years. The period of observation for the twins was from the age of 1;6 to 3;6 and for Julia from 1;2 to 2;5. More detailed information on the data and its recording can be found in Clahsen (1982, ch. 2).

- e. *da paßt nicht* M (2;4)
 there fits not
 'These pieces do not fit together'.
- f. *dreht immer* M (2;5)
 turns always
 (The child points at a roundabout that is revolving.)

These examples illustrate that properties of the grammatical subject do not affect the children's choice of verb inflections in phase II. The frequencies presented in Clahsen (1986b) show that for all of the subjects that occur, $-\emptyset$ or $-n$ can be used, regardless of the grammatical person concerned. Only the suffix $-t$ seems to have a particular meaning for the children.

There is some debate about what the exact meaning of the suffix $-t$ might be for a child in phase II/III. Based on data from three bilingual children (German and French), Meisel (1990) suggested that $-t$ is an agreement suffix, even at the earliest stage of grammatical development. The trouble with this claim is that there are strong restrictions on the use of $-t$ —at least with monolingual German children—that cannot be captured by assuming that $-t$ encodes subject agreement, that is, 3Pers. Sing. Notice first that there are many cases of 3Pers. Sing. subjects in phase II/III where $-t$ does not occur on the verb. Table 2 of Clahsen (1986b) shows that in phase II, 3Pers. Sing. subjects are correctly marked in 32% of the obligatory contexts. In the remaining cases (68%), there are agreement errors, mostly with the suffix $-n$ and with $-\emptyset$. This shows that $-t$ cannot mean 3Pers. Sing. Moreover, $-t$ is used with a restricted class of verbs, mostly with intransitive verbs, such as in (10d), (10e), and (10f) given earlier. In my data on phase II/III, $-t$ typically occurs in sentences of *low* semantic transitivity (see Hopper & Thompson, 1980), that is, with one-place predicates and an inanimate Theme argument in which no physical activity is expressed. Tracy (1990) found in her longitudinal data of monolingual German children that $-t$ is also used in contexts where some reference to completed actions or states is expressed. Thus, the suffix $-t$ could be an aspect marking denoting completion. More data are needed to determine the exact meanings of the suffix $-t$ in phase II/III. However, the available data on (monolingual) children converge on one point: Subject agreement is not yet present at the earliest stage of syntactic development.⁹

⁹Some observations made by Meisel (1990) suggest that his data on bilingual children are different from that of monolingual children, at least with respect to the development of subject agreement. For example, Meisel (p. 23) observed that in his data, utterances with the verb inflection $-t$ normally contain a subject. This does not hold for monolingual children. In the early stages of the children I studied, the percentages of empty subjects in sentences with the verb inflection $-t$ are quite high: phase II: 91% (Daniel), 86% (Mathias); phase III: 56% (Daniel), 71% (Mathias); phase II/III: 56% (Julia). Notice also that there are no clear

In phase III, the inventory of verbal markings is extended; at this stage the children also use *-e* systematically. At first, this form is also overgeneralized.

- (11) *weiße nich* M (2;9)
 know-1Pers. Sing. not
 'I don't know'. (Standard German: *weiß nich*)

Most of the overgeneralizations are similar to (11), where *-e* is added although German only requires *-Ø*. The form *-e* in general is not used as a separate inflection, but – as in main verbs in Standard German – it is in free variation with the null suffix. In phase III, there are still a large number of overgeneralizations and agreement errors in the inflections the children use. Moreover, we found verb forms in phase III that do not exist in the adult language. The markings on the verbs in (12) may be called pronominal copies (see Clahsen, 1986b; Tracy, 1989, for discussion).

- (12) a. *fels noch nich iser putt* D (2;10)
 rock yet not is-he broke
 'The rock is not yet broken'.
 b. *das iser fest* D (2;10)
 that is-he fixed
 'This is fixed'.

differences between these figures and the percentages of empty subjects in sentences with the verb inflection *-n*.

Moreover, Meisel found that in his data, zero markings (i.e., bare verbal stems that violate the target norm) are extremely rare. This also does not hold for monolingual children. As can be seen from Table 1 of Clahsen (1986b), only 48% of Mathias' and 56% of Daniel's stem forms in phase II are correct in terms of the target norm (for Julia, we only have one example of a stem form in phase II).

Finally, Meisel (p. 43) observed that in the bilingual children he studied, the acquisition of obligatory verb second does not correlate with other grammatical developments, such as the acquisition of subject agreement. He observed that all the standard verb forms emerge earlier in bilingual children. In monolingual children, however, we find a correlation between the acquisition of correct subject agreement and the use of generalized verb second (Clahsen, 1986b).

One factor that might perhaps be relevant to explain these differences is that, at least in the early stages of grammatical development, French seems to be the dominant language for the children Meisel studied. In later development, German becomes more important. Thus, it could be that, at the time these children start to acquire the German agreement system, their grammatical knowledge (due to their previous acquisition of French) is more advanced than that of monolingual children when they begin to learn verb inflections. This would account for the fact that Meisel could not confirm some of the error patterns that have been observed with monolingual children.

Although *verb placement* in phase II/III is variable, the children do not use all of the logically possible patterns. Verb-initial patterns with the verb appearing before the subject are practically nonexistent in phases II and III. Rather, verb placement is restricted to verb-second and verb-final patterns.¹⁰ The extent to which both these patterns are used differs from child to child, but verb-final patterns are dominant for all children. In addition to this, we found word-order asymmetries between various kinds of verbal elements. It has been observed for these stages in various empirical studies (e.g., Clahsen, 1982; Mills, 1985) that verbal elements with the suffix *-t* and modals are dominantly placed in the verb-second position (see 10a, 10d, 10e, 10f), whereas infinitives and verbs with other inflections predominantly occur sentence-finally (see 10b, 10c). This suggests that even in the early phase II/III the child's grammar has two different positions for verbal elements.

In phase II/III, *grammatical subjects* are often absent from the children's utterances. In my data, the mean proportion of empty subjects in phase II/III varies between approximately 25% for Julia and 40% for the other children (Clahsen, 1986b). Moreover, there is no significant difference between phases II and III concerning the absence of grammatical subject. Contrary to the adult language, the children leave out various kinds of thematic subjects in these early phases (see 10a, 10d, 10e, 10f, 11; for further discussion, see Clahsen, 1982).

Finally, consider the *placement of the negator*, which has been described in Clahsen (1988a). In phase II/III, I found preverbal and postverbal negation. The latter typically occurs with verbs inflected with the suffix *-t* and with modals, whereas preverbal negation is used with verbs in the infinitive form *-n* and the stem form (*-Ø*) (compare (13a) and (13b)). Moreover, we find that in preverbal negation, the negator can be separated from the verb (e.g., (13a)), whereas in postverbal negation *nicht* comes directly after the verb, even when German requires separation from the verb, as in (13c).

- | | |
|--|------------------------|
| (13) a. <i>nich aua mache</i>
not ouch make | S (1;10) ¹¹ |
| b. <i>macht nich aua</i>
makes not ouch | S (1;10) |

¹⁰Whenever there was no overt subject, it was assumed that it was phonetically null and was counted as the first-position element for the placement of the verb. Thus, when the verb overtly appears in first position, as in (10d) and (10f), this counts as a second position if the subject is missing.

¹¹(13a) and (13b) come from Miller's (1976) longitudinal study of German child language. These data were analyzed in Clahsen (1988a). Note that Miller's child "Simone" comes from the Frankfurt area, where the form *-e* (schwa) is a phonological variant of *-n*.

- c. *kann nicht das zumachen* J (2;4)
 can not that close
 'I can't close this'.

4.2 Phase IV

In phase IV, considerable developments take place in the children's grammars. The *subject agreement* system of the adult language is basically available. The children now use all of the inflections in the paradigm, and they no longer use forms not possible in the adult language. With regard to the development of agreement, the characteristic feature of phase IV is the acquisition of the suffix *-st* (= 2Pers. Sing.). The frequencies given in Clahsen (1986b) show that there are almost no overgeneralizations in the use of *-st*; that is, this form is used correctly from the beginning. We also see that the other forms are now used as agreement markings: The overgeneralizations in the use of *-Ø*, *-t*, and *-n* disappear. Moreover, pronominal copies (as in (12)) no longer occur in phase IV. Thus, the availability of *-st* can be regarded as a decisive step in the development of the agreement system (see also Mills, 1985). Consider as an illustration the following examples from phase IV:

- (14) a. *das kommt da gleich an* M (3;0)
 that comes there soon on
 'That (ship) is arriving here soon'.
- b. *das ist Theo* M (3;0)
 that is Theo
 (M. is looking at a picture book.)
- c. *ich hab ihn aufgesetzt* M (3;1)
 I have it on put
 (M. has put on a hat.)
- d. *jetzt hast du sechs* M (3;1)
 now have you six
 (M. is telling his mother that he now has six croissants.)
- e. *die eisenbahn hat die Julia puttmach* M (3;0)
 the railway has Julia break
 'Julia has broken the railway'.
- f. *mach das denn noch sik?* M (3;0)
 makes that then still music?
 'Does that still play music?'
- g. *das darfst du nicht* S (2;2)
 that may you not
 'You are not allowed to do this'.

- h. *so geht das nich* S (2;4)
 so go that not
 'It doesn't work like this'.
- i. *der teddy zu dick is* J (2;4)
 the teddy bear too fat is
 'The teddy bear is too fat'. (Standard German: *Der Teddy ist zu dick.*)

Verb placement is now mostly correct, also in structurally complex contexts, with, for example, separable prefix verbs and verbal groups. The finite verbal element appears in the verb-second position and in *yes/no* questions at the beginning of the sentence. In some cases, we find that the finite verb is placed in clause-final position in main clauses (see (14i)). However, this pattern is very rare before phase V (less than 10% in my data). It would be correct in embedded sentences in German. Note that the acquisition of the correct position of the finite verb takes place within a very short period of time. The values for the use of verb second increase from about 40% in phase II/III to over 90% in phase IV (see Clahsen, 1988b, for further details).

In phase IV, *grammatical subjects* are explicitly realized in most cases. We found that the mean proportion of empty subjects varies between 10% and 20% in phase IV (Clahsen, 1986b). This shows a significant decrease from the percentages of empty subjects in phase II/III. Unfortunately, we do not have any comparable figures for the adult language, but I presume that the values of phase IV come close to those of spoken German.

As is shown in Clahsen (1988a), the *placement of the negator* is now basically correct. Instances of preverbal negation disappear, and in phase IV *nicht* is also separated from the finite verb in postverbal negation as required by German (see (14g), (14h)).

The final step in this development is characterized by the appearance of embedded clauses in phase V. We found that there are no verb-placement errors in embedded clauses (Clahsen, 1982). Rather, the children place the finite verb in clause-final position, as required in embedded sentences in German. This finding is striking, because the position of verbal elements in embedded clauses is different from that in main clauses, and it could be expected that the children would initially overgeneralize the verb-second pattern. The data on German child language currently available show that such a prediction is clearly false. This is confirmed by Rothweiler's (1989) extensive study of the development of embedded clauses in German child language.

On the whole, the research summary given here shows that a clear developmental shift takes place between the early grammatical system of

phase II/III and phase IV. We found that there are developmental correlations between (a) the acquisition of subject agreement, (b) the increase in the use of verb-second patterns, (c) the decrease of empty subjects, and (d) the use of the negation patterns required in German. With respect to these phenomena, phase IV corresponds to the target language. The grammatical analysis proposed in the next section should enable us to derive the observed sequence of phases as well as the developmental correlations.

5. A GRAMMATICAL ANALYSIS OF THE DEVELOPMENTAL SEQUENCE

With respect to a grammatical analysis of the empirical results, two questions arise:

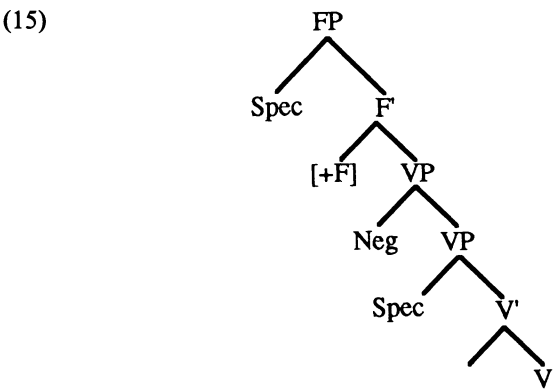
1. Can the observed phases be represented in the form of grammars?
2. To what extent is the observed developmental progress determined through lexical learning?

In order to answer these questions, I apply recent developments in Government and Binding Theory, particularly the proposals made by Pollock (1989) and Chomsky (1989), to the study of child language grammars. There, it is suggested that the features of Infl (i.e., agreement, tense, etc.) be distributed to different functional categories that can have maximal projections in the syntax. Thus, there are no longer just verb phrases, Infl phrases, and so forth, but also Agr phrases and Tense phrases. The original idea was motivated by some differences in word order between English and French (Pollock, 1989), and there have been efforts to analyze other languages within this framework (Laka & Mahajan, 1989). Haegeman (1989) and Grewendorf (1990) suggested analyses for German within this new framework. In addition, the parameters in (9) (section 3.4) are adopted in my analysis of the child language data.

5.1 Phase II/III

Consider first the phrase structure tree in (15), which should account for the child's grammar in phase II/III.

I suggest that the children's lexicon contains elements that are categorized as [+F(inite)] in phase II/III and that the highest phrase structure position in



(15) is a projection of the feature [+F]; we might call this position FP (see Chomsky, 1989). Elements marked with [+F] in the lexicon are base-generated in the position [+F] occupies in (15). In contrast to the adult language, the interpretation of [+F] in phase II/III does not involve subject agreement and complementizers have not yet been identified. Therefore, the position occupied by [+F] in (15) is underspecified with respect to its syntactic category. The most important elements that are marked with [+F] are modal verbs and the verb suffix *-t*. That modal verbs are marked [+F] in phase II/III could be due to the semantic content of these verbs. According to Steele (1981), a modal has meanings that make it a classical candidate for a finite verb (= Aux in Steele's terminology), regardless of its inflection (see also Weerman, 1989). The verb suffix *-t* has the feature [+F] according to its function as an aspectual or transitivity marker. Note that *-t* is the only verb inflection with a meaning of its own. The other inflectional elements (*-n*, *-Ø*) do not yet have content in phase II/III.

The observed *verb placement* patterns can be derived from (15).¹² Modal verbs are base-generated in the position occupied by [+F] in (15). The inflectional element *-t* is also inserted here and triggers verb movement, because an affix such as *-t* may not be left dangling. Verbs with *-n* and *-Ø* are inflected before D-structure and are inserted at V. In these cases, [+F] does not have to be lexicalized, and the child can have a partial tree without an FP. This accounts for the observed word-order asymmetries.

I assume that *empty subjects* are licensed by [+F] in (15); in this respect,

¹²Notice that the initial position in (15), FP-Spec, could be taken as a topicalized position, which accounts for why it may be filled with subjects and nonsubjects alike.

[+F] is similar to Infl in Rizzi's (1986) account. We observe that there is no subject agreement in phase II/III. This means, in terms of Rizzi's theory of *pro*, that there are no person and number features the child could use to identify *pro*. Thus, the recovery parameter has to be left open. This makes empty referential subjects as they are found in phase II/III possible.

With regard to *negation* we have to account for the observed asymmetry between preverbal and postverbal negation. In sentences with postverbal negation, there is typically a finite verb in the second or initial position. In these cases, [+F] is lexicalized. In sentences with preverbal negation, there is a nonfinite verb in clause-final position. In these cases, [+F] is not lexicalized, and the verb is in VP. Following Webelhuth and den Besten (1987), I assume that the basic position of the negator is as shown in (15). This together with the verb positions of (15) allow us to derive pre- and postverbal negation patterns. Thus, the position of the negator relative to the verb is, to a large extent, a function of verb placement. However, one aspect of the placement of *nicht* does not follow from this alone: When the verb precedes the negator, the verb and *nicht* must be contiguous (see (13)). This is different from the adult grammar, where the object can occupy the position between the verb and the negator (see (5)). There is an ongoing debate on how cases such as (13) could be analyzed in phase II/III. I do not enter into this discussion here.¹³

5.2 Phase IV

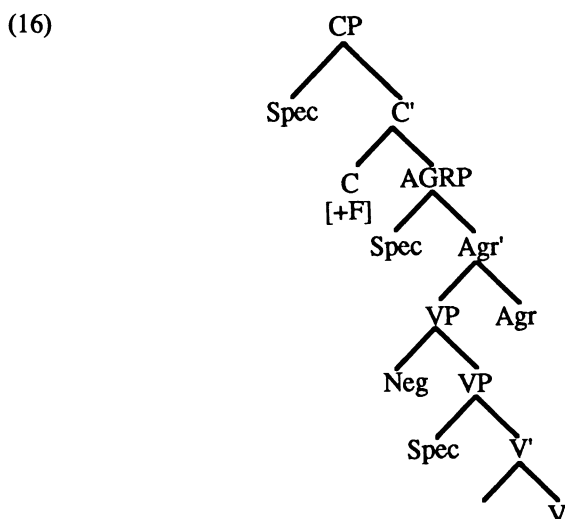
In phase IV, the verb inflection *-st* of the 2Pers. Sing. is acquired. This indirectly has consequences for several areas of the children's grammar. With the acquisition of *-st*, the children have the full paradigm of subject agreement and correct verb second in main clauses. At the same time, the

¹³One way to account for examples such as (13) could be that scrambling is missing in phase II/III. This would mean that objects cannot be moved from their underlying position to the left of VP. However, assuming that scrambling is not available in phase II/III implies that the negator *nicht* or other VP adverbials should not intervene between the object and the nonfinite verb. The trouble is that such data exist in phase II/III. Therefore, additional considerations are necessary to analyze the placement of *nicht* (see Clahsen, 1988a, and Weissenborn, Verrips, & Berman, 1990, for discussion).

In phase IV, the placement of the negator *nicht* is as in the adult language. Thus, when the verb precedes the negator, other constituents may intervene. This suggests that scrambling is clearly available to the child at this time and that, in contrast to phase II/III, it is also used in utterances with the negator *nicht*.

As the focus of the following is on syntactic phenomena that are related to the acquisition of subject agreement, I do not discuss the development of scrambling further.

use of empty subjects decreases considerably. These developments can be accounted for in (16):



Compared to (15), two changes occur in (16): (1) an Agr phrase has been introduced above the VP, and (2) the former FP is specified as a CP. Both these changes are related to the acquisition of subject agreement.¹⁴

In phase IV, verb inflections are categorized as Agr elements just as in the adult grammar. For example, this means that *-t* is no longer an aspect or transitivity marker but rather encodes subject agreement. Moreover, as required by German, modal verbs are verbs (V^0) in phase IV. The availability of the subject-agreement paradigm in phase IV allows the children to discover that agreement inflections in German appear with ordinary verbs *and* with modal verbs. This might be regarded as the trigger for categorizing modals as verbs.

The acquisition of subject agreement also leads to changes in the syntax. The children now have the options that the Agr Parameter offers to them. Note that with the acquisition of *-st* the children have person agreement. Based on Platzack and Holmberg (1989), person agreement can be seen as the trigger for setting the Agr Parameter at the value (9bi). This together with X' principles for building maximal projections from X^0 categories allow the child to construct the Agr phrase in (16).

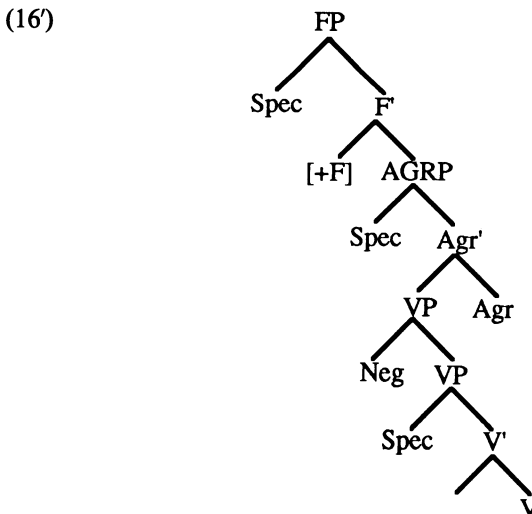
¹⁴(16) is identical to the tree proposed by Haegeman (1989) for German, except that Haegeman had an additional T(ense) phrase (TP) dominated by AGRP. How TPs are built into (16) has to be left open, as there are not enough data on the development of tense markings in German.

The second syntactic change occurring in (16) is that the former FP is specified as a CP. This is related to the identification of complementizers and to the fact that the categorization of finite verbs has changed in phase IV. In phase II/III, [+F] is marked on certain elements in the lexicon, such as on modals and on *-t*. This does not hold for phase IV, due to the acquisition of subject agreement. Similar to the adult language, there are no elements in phase IV that are lexically marked with [+F], and the whole verb-inflectional paradigm occurs under Agr. Because finite verbs cannot be base-generated in the position [+F] occupies in (16), the syntactic category of that position cannot be determined by a finite verb. This together with the identification of complementizers could be the trigger for specifying the former FP as a CP in phase IV and for setting the Verb-Second Parameter at the target value (9aii).¹⁵

The tree in (16) generates the *verb-second patterns* required in German main clauses. Agreement inflections are inserted into the Agr position of (16) and trigger verb movement (in order not to strand bound morphology).

¹⁵Given that (16) holds for phase IV, we might expect embedded clauses with lexically filled Comp and clause-final placement of the finite verb to occur in phase IV. However, embedded clauses occurred in my data somewhat later, in phase V. This could simply be due to a lack of relevant data for phase IV. In this case, the only thing that distinguishes phase IV from V would be the use of embedded clauses in V.

An alternative possibility might be that there is a precursor in development to the actual tree (16), namely (16'):



This tree is similar to (16), but it does not offer a place to base-generate Comp. However, the tree in (16') and the way finite verbs are generated in phase IV do not fit together. Therefore, (16') probably does not hold for a long time. More data are needed to decide this issue.

Through further movement to C, the verb gets to the second structural position in (16).

Compared to the early phase II/III, the use of verb second has changed in phase IV. Whereas in phase II/III verbs move to the [+F] position of (15) only when a morpheme that is lexically marked with [+F] occupies this position, in phase IV all verbs move from Agr to C (if C is not lexically filled with a complementizer). Thus, in phase IV the children have generalized verb second as in the adult grammar. I suggest that the development of generalized verb second is closely related to the acquisition of subject agreement. Recall from section 3.4 that, according to Platzack and Holmberg (1989), verb second is obligatory in the adult grammar because of a licensing condition on nominative case marking. The condition says that nominative case has to be governed by [+F], and it requires that the position [+F] occupies has to be lexicalized, either with a complementizer or a finite verb. In phase II/III, the child has only a small number of finite verb forms, such as modals and *-t*, and no complementizers. With these elements it is not possible to lexicalize [+F] in all cases. Instead, matrix clauses are often VPs in phase II/III. In contrast to that, the child has a productive inflectional paradigm of subject agreement in phase IV. This allows the child to generate finite forms for all verbal elements and to move them to Comp (due to the licensing condition on nominative case marking) when no complementizer is generated in this position. In this way, the observed differences in the use of verb second can be accounted for.

The decrease in the proportion of *empty subjects* in phase IV also correlates with the development of subject agreement. Recall that according to Rizzi (1986), the interpretation of *pro* involves mechanisms that assign Φ features (number, person, etc.) to *pro* (section 3.4). In particular, subject agreement can assign features to *pro* in subject position in languages for which Agr is designated an identifier in terms of the recovery parameter (9c). In phase II/III of the development of German, the child does not yet have person and number features to identify empty subjects. Therefore, the requirements on the interpretation of *pro* are vacuous at this stage. In phase IV, however, Agr is available to the children. This offers the options of the recovery parameter (9c), that is, whether or not Agr features specify *pro*. The parameter is correctly set at the value (9cii) in phase IV. Hence, Agr furnishes *pro* with no Φ features at this and later stages and *pro* can therefore only function as an expletive. This accounts for the observed decrease in the proportion of empty subjects.¹⁶

¹⁶What triggers the correct setting of the recovery parameter in German child language is not clear. Hyams (1986) suggested that expletives are possible triggers. Note that similar to English, German also has overt expletive pronouns that could be the trigger for setting the recovery parameter at the target value. This implies that there are correlations in development

6. SUMMARY AND CONCLUSION

The present article contributes to developing more constrained accounts of first language acquisition within the parameter-setting model. Three guidelines were discussed that restrict the class of possible UG parameters as well as the way they can be fixed in development: (1) the continuity constraint, which requires that parameters do not mature in development; (2) the parameterization constraint, which states that parameters can only refer to heads or properties of heads; and (3) the parameter-setting constraint, requiring that fixed parameters cannot be reset (see section 2). The question at the beginning of the article was whether it is possible to describe a child's real-time development of language within such a restrictive model of acquisition. My test case for examining this question was a set of acquisition data from German child language.

I briefly recapitulate the development of the parameters under study with respect to these three guidelines. The analysis of the acquisition data is consistent with the continuity constraint, as it shows that there is no delay in setting a parameter once the information necessary for its determination is available to the child. Thus, as soon as person agreement is acquired, the Agr Parameter is fixed; and as soon as complementizers have been identified, the Verb-Second Parameter is set.¹⁷ This suggests that the UG

between the use of expletives and the decrease of empty referential subjects. More data are needed to determine whether or not such a correlation exists in German child language.

Roeper and Weissenborn (1990) proposed that the subordinate clause is the relevant triggering domain. They noted that because pragmatically sensitive omissions of subjects in German are found in matrix clauses, the child, simply from looking to matrix clauses, cannot decide whether or not empty subjects are grammatically licensed in the target language. Therefore, the child has to look at subordinate clauses for confirmation. Roeper and Weissenborn's proposal does not account for the developmental link between the acquisition of subject agreement and the decrease of empty subjects in phase IV. Moreover, they predicted that after the advent of embedded clauses, there should be no argumental or quasi-argumental empty subjects. However, this is not confirmed in the data. In her study of the development of embedded clauses in German child language, Rothweiler (1989) found 44 out of 824 embedded sentences (with clause-final placement of a finite verb) that did not have a referential subject; note that all the children she studied have verb second. In my data, there are also subjectless embedded sentences after the acquisition of verb second, for example, Mathias (3;5): *weil das nicht gerne möchte* because that not really want 'because (I) do not like to do that'. Such cases of empty subjects could be pragmatically determined. The data indicate that they are also possible in embedded sentences.

¹⁷A somewhat weaker correlation exists between Agr and the use of empty subjects. As mentioned, the use of empty subjects decreases considerably, as soon as Agr is discovered. We also observed that, even after the acquisition of subject agreement, there are sentences (approx. 10%) with empty referential subjects. This could mean that the Recovery Parameter has not yet been set (see Roeper & Weissenborn, 1990, and fn. 16). Alternatively, we might assume that these rare cases of missing subjects are pragmatically determined.

parameters studied here are present from the onset of language development and that they are set when the child has identified those grammatical aspects that are relevant to fix them.

Moreover, in the proposed analysis only parameters that refer to heads or properties of heads are adopted. It was not necessary to assume syntactic parameters. This is consistent with the parameterization constraint. It has been shown that in German child language the acquisition of subject agreement has several syntactic consequences. The results suggest that restructurings of the child's grammar are triggered by lexical (or morphological) items and their associated properties. In addition, the proposed analysis does not invoke the resetting of a parameter that has previously been fixed by the child. This is in accordance with the third constraint. In phase II/III, the parameters are still open, because those elements that are part of the parameters' triggering conditions are not yet acquired. The parameters must await the child's acquisition of, for example, Agr and Comp, before they can be set at particular values. Provided that this analysis can be maintained, parameter resetting of any kind does not have to be assumed.

Finally, in light of the constraints mentioned, consider the development of phrase structure, in particular (15) and (16). X-bar principles taken as a learning device allow the child to construct phrasal categories (X^{\max}) for the lexical (and morphological) categories (X°) extracted from the input (see, e.g., Pinker, 1984, for specific proposals). Principles of this kind are necessary to construct the tree in (15) in phase II/III (see Clahsen, 1988b) and to build up Agr phrases in phase IV (see (16)). However, there is one point in development where the observed restructuring is not just due to the mechanism that expands an X° to X^{\max} , namely the change from FP in (15) to CP in (16). Recall that in phase IV, CP is not just added to the earlier tree; rather, CP in (16) replaces the former FP of (15). We could say that the FP in phase II/III is in fact underspecified and that during further development this phrase is specified as a CP. However, the position of FP/CP in the tree remains the same. Thus, it seems that the child has two choices for restructuring a previous phrase structure tree, either adding maximal phrases through X-bar principles or specifying features of existing phrases. What does not happen, at least in the data under discussion, is that structural positions, once they have been created, are simply expunged at some later point in development.

Cross-linguistic comparisons are necessary to determine whether learning mechanisms deleting phrase structure positions are in fact superfluous. More evidence is also needed in support of the idea of adding features to underspecified phrase structure positions. This could also play a role in the acquisition of other phenomena. If the development of syntax is assumed to be triggered by the acquisition of lexical properties, then we should expect

to find more cases in which an underspecified phrase structure position is relabeled as the result of the child's acquisition of grammatical features of the corresponding head. More research is needed to find cases of this kind in the developmental data.

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