Null Arguments and the Acquisition of Case and Infl[1]

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1 Introduction

This paper will attempt to provide a theoretical framework for the analysis of the acquisition of abstract Case and Infl in children and their relationship to the acquisition of obligatory subjects and several other phenomena of language development. This analysis will be done within the Government Binding (GB) framework, as described in Chomsky[Cho81] and in subsequent works. This framework will ideally account for the order of acquisition of the elements of language, for many of the typical mistakes which children make, and for the way in which these mistakes are made.

We will be appealing to Borer and Wexler's maturational hypothesis of language acquisition [BW87] throughout this paper. Borer and Wexler, challenging Pinker's "continuity hypothesis" [Pin84], claim that we should endeavour to model a time-dependent process, such as language acquisition, in a paradigm which takes into account the maturation of the learner. Pinker's claim is that the principles and the representations with which a child analyzes his language do not change, whereas Borer and Wexler's hypothesis states that certain principles of linguistic competence *mature*, on analogy with other biological processes, such as the development of long-term memory, or of secondary sexual characteristics. The availability of certain linguistic principles is not, therefore, solely dependent upon external evidence. Although, as will be seen in Section 3, we disagree with Borer and Wexler on some details of their analysis—in particular their hypothesis about the maturation of A-chains—we believe that their proposal that some linguistic abilities mature is essentially correct.

We do not need to invoke the maturational hypothesis to explain all facets of language acquisition. It appears, though, that some facets of acquisition are best explained by appealing to maturation. In particular, we claim that the ability to Case-mark matures in children. Other grammatical structures appear to be induced by the language learner[2] or are available from the onset of the acquisition process. For example, the Infl node appears to be induced by the child as a by-product of the morphological analysis of his language. That is, once the learner of English begins to analyze morphological change as a productive process (along with the analysis of some additional factors, such as the auxiliary system) he will postulate Infl as a distinct category. The actual mechanism of this inductive process will be discussed in some detail in Section 5.

***I would like to thank Robin Clark for his help and guidance in the preparation of this paper. I would also like to thank Ted Gibson and Paul Bloom for their comments on earlier drafts.**

[2]When we say that the learner "induces" a particular structure or formal principle, we mean that he has observed a process or generalization which is statistically significant in a subset of his language and has taken that as a principle which applies throughout the entire language.

2 Some Empirical Observations

There appears to be a relatively short period of time during which several rather important and superficially unconnected grammatical phenomena axe mastered by children acquiring English. These are as follows:

- Lexical subjects and objects become mandatory. The obligatory inclusion of subjects by children is a topic which has been discussed at great length in the literature—see [HyaS6,Hya87,LebS7,GuiS4] and the references therein. Obligatory inclusion of objects, however, has not been closely studied, because dropped objects are relatively rare. Nonetheless, their inclusion follows naturally from the same principles which force the inclusion of subjects.

- Copular constructions become productive. Henry Davis [Dav86] has noted that apparent exceptions to this observation—contracted copulas such as "That's mine"—found very early in a child's linguistic development, axe nothing more than unanalyzed lexical items, learned by rote. Our data support this conclusion. These constructions are highly stereotyped, and not at all productive.[3]

- Auxiliaries begin to be used correctly. This has also been noted by Guilfoyle [Gui84]. Pinker [Pin84] has noted that auxiliaries are acquired lexical item by lexical item. This is not in conflict with our observations. In our analysis, we define the stage of grammatical development necessary for the child to *begin* to analyze auxiliaries.

- The use of tense (expressed by the "-ed" and "-s" morphemes) becomes common. This has also been noted by Guilfoyle.

- Negation becomes adult-like. That is, children master the relative placement of negation markers with respect to subjects and auxiliaries.

- The infinitive marker "to" emerges. This has also been noted by Hyams [Hya87].

- Genitive and partitive constructions become correctly analyzed. The near simultaneous acquisition of genitives and copular constructions has been noted by Brown [Bro73], although he did not study the acquisition of partitives.

[3]The notion of productivity is a source of much controversy among language researchers (see de Villiers and de Villiers [dVdV85]). Our characterization of productivity is that the child should use a grammatical construction in a variety of linguistic contexts, with a relatively high degree of accuracy (well above the chance level). So, for instance, copulas should appear in interrogative as well as declarative sentences, and should exhibit person and tense agreement. Observing a child correctly utter "that's mine" any number of times does not constitute productivity. However, observing that same child utter "those are my ears", "he is sleeping", "what are these", "what is Daddy holding", as Nina does at age two years, two months (henceforth 2-2) indicates that that child has mastered the form, and is not merely utilizing rote-learned phrases, or imitating others' utterances.

Figures 1 and 2 contain samples of data taken from Nina at ages 2-1 and 2-3.[4] Although she has not completely mastered any of the constructions given above, she is markedly more productive and more proficient at them by 2-3 than she was two months before. These advancements have two properties in common: they crucially depend upon Case-marking and an adult-like Infl node in order to begin to function in the child's grammar. The various developments will be discussed in turn.

(1a) No living room.
(1b) No hop Mommy kangaroo.
(1c) I in the kitchen.
(Id) All gone the coffee.
(1e) Fall down. Falling down.
(If) Eating balloon.
(1g) You jamas. You jamas.
(1h) My have more.
(1i) Put the little pop.
(1j) Put my kangaroo on.

Figure 1: Nina at 2-1

(2a) You put it on the reindeer.
(2b) Don't put my horse on the tail.
(2c) I don't have valentine.
(2d) That's not a mane. That's a neck.
(2e) Will you want to go on train Mommy?
(2f) I will need my spoon too.
(2g) I want to make a zoo now.
(2h) You make a zoo for me.
(2i) Nina's Daddy.
(2j) Where's dolly's bottle?
(2k) This is a mouse.
(21) Those are trees too.
(2m) He has a valentine and a hat.
(2n) Her cutting piece of wood.

Figure 2: Nina at 2-3

In fact, we can easily account for the acquisition of all of the changes evidenced in Figures 1 and 2 by postulating two developmental (parametric) changes which occur at

[4] All of the data used in this paper were taken from the CHILDES database [MS85J. The data for Adam was taken from the Brown study [Bro73], the data for Peter was taken from the Bloom study [Blo73], and the data for Nina was taken from the Suppes study [Sup73].

this time. They are: Case-marking (and the Case filter) becomes active; and Infl develops as a fully realized $\overline{X}$ node, the head of S.[5] The development of Infl could be considered in two ways—either Infl is part of the child's innate linguistic endowment, but is initially completely unspecified, or it is simply missing from a child's early sentence structure and hypothesized at some stage of development. This is a difficult difference to test for, as no useful predictions follow from postulating one formalism over the other. For expository reasons, we have adopted the latter formalism, although we believe that the former formalism is more supportive of the innateness hypothesis.

The hypothesized change in the basic structure of a sentence due to the development of Infl is shown in Figure 3.

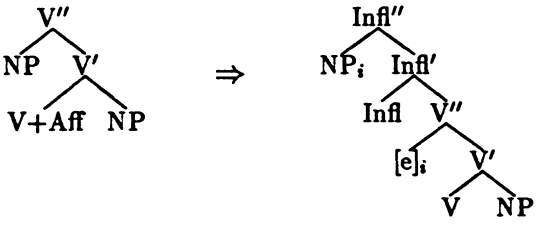


Figure 3: From Child to Adult Sentence Structure

By postulating the above developments, we can account for the development of mandatorily realized lexical subjects and objects. We do this by appealing to notions of recoverability such as Jaeggli and Safir's morphological uniformity parameter [JS87], which claims that null subjects are only permitted in languages which have morphologically uniform inflectional paradigms, and Huang's analysis of empty pronouns [Hua84], which claims that dropped arguments can only be recovered when there is "rich enough" agreement or no agreement at all. In the former case, the dropped argument is fully specified for number and person by the verbal inflection, and in the latter case it is specified by discourse determined topics.

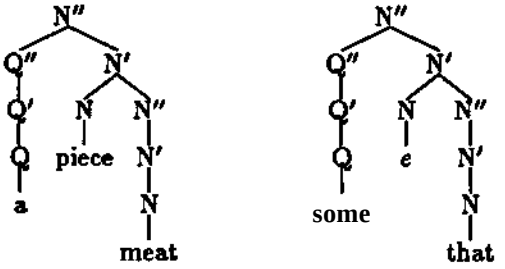
We claim, then, that the child's initial analysis of his language is as morphologically uniform and discourse oriented (henceforth DO), i.e., [+uniform, +DO]. That is, children learning a language initially assume that their language is morphologically uniform and morphologically simple, and that the content of empty categories may be recovered through discourse determined topics. Eventually, the learner morphologically analyzes his language. This analysis realizes itself in the learner's linguistic competence as the development of Infl as a distinct, fully realized $\overline{X}$ node. At this time the learner of English must reanalyze

[5]We hypothesize that these developments occur in any child acquiring English in a normal environment, and that the child's linguistic environment is largely irrelevant. A discussion of the effects of parental input is given by de Villiers and de Villiers [dVdV85]. While there seems to be no definitive statement on the effects of parental input on the order of acquisition of selected morphemes, even proponents of the belief that parental input affects the child's acquisition only claim that the order of acquisition of particular morphemes is altered, and not the overall acquisition of syntax.

his language as morphologically non-uniform, and sentence oriented, thus barring non-overt pronouns. The mechanism of this analysis will be described in detail in Section 4.

Furthermore, we can easily account for the lack of *productive* auxiliaries, tense and agreement, and infinitive-marking "to" by noting that all of these constructions crucially depend upon an adult-like Infl. That is, they axe all analyzed in Infl in the adult grammar. Consequently, the child has no way to analyze any of these constructions until he has first postulated the presence of the Infl node. In fact, we postulate that Infl is developed in three stages, coinciding with Bellugi's three stages of acquisition of negation [Bel67], In the first stage, affixes are not analyzed separately from their verbs, as suggested in [Leb87]. In the second stage, Infl is induced in an impoverished form, similar to that suggested by Aoun and Li for Chinese [AL87]. In the third stage, a full adult-like Infl is induced, and the child begins to acquire the constructions predicted above.

Finally, we can account for the correct use of personal pronouns, genitives and partitives by simply noting that these constructions all depend upon Case-marking for their surface form: personal pronouns axe realized as one form or another by being assigned accusative, nominative or genitive Case; the possessive -5 morpheme is a surface realization of genitive case, assigned by the head noun to its specifier; and the preposition "of Case-marks the quantified noun in a partitive construction (i.e., in the partitive "a piece of cake", we denote "a piece" the quantifier and "cake" the quantified noun). The child's partitive construction would be analyzed exactly as would the adult's, with the exception of the insertion of the Case-marking "of". That is, there is no structural reanalysis necessary on the part of the child, but simply the setting of a parameter. For instance, the trees given below describe two of Adam's partitive utterances (given in (4a-b)). In the adult grammar, these trees would be identical, with the exception of the insertion of "of" to assign case to the quantified noun:



All of the above-mentioned superficially unrelated constructions are acquired, although not mastered, by the child in a relatively short period of time (about two to three months). This is a direct consequence of their dependence upon Case-marking and the structure of Infl in order to manifest their surface form. The child's lack of immediate mastery of these constructions once Case-marking and Infl have developed is presumably a consequence of other complications, such as the acquisition of the appropriate lexical items. In addition, the setting of a parameter in the grammar is apparently not an instantaneous process: some period of variability typically follows the setting of a parameter. Our criterion for deciding when a parameter has been set is the appearance of *productivity* in any given construction.

3 Case-marking

As noted above, Hyams, Guilfoyle and Lebeaux have discussed various approaches to the child's setting of the null subject parameter, all involving differing notions of the structure of Infl and the child's ability to Case-mark. If our hypotheses are correct then these other analyses are called into question. English speaking children, during the stage when they can license null subjects and objects, seem to lack both a distinct Infl and the ability to Case-mark. The lack of overt Case-marking is evidenced by four phenomena which are not part of the child's grammatical competence: genitive constructions, partitive constructions, copular constructions and well discriminated pronoun categories.

It may be argued that the children do not exhibit the above phenomena for reasons other than (the absence of) Case-marking. For instance, one might posit that the children simply haven't learned the appropriate constructions, or they haven't attended to these grammatical facts, since all of them—genitive -5, the forms of "be", and prepositions—are phonologically unstressed, and could easily be overlooked by the child. However, this does not appear to be the case. Brown [Bro73] points out that the prepositions "in" and "on" are acquired far earlier than either genitives or copulas. Furthermore, our own data show that "in" and "on" are acquired much earlier than the prepositions "for" and "oP. We calculated the frequency of usage of the prepositions "in", "on", "of and "for" in Nina, Peter and Adam, both before and after Case-marking was determined to become active, and compared this to the frequency of these prepositions in their mothers. The calculation shows the frequency of the given word, as a percentage of the total number of words spoken. This frequency was calculated for each of the children in the 10 weeks preceding the onset of Case-marking, as well as the 10 weeks following. The results are given in Figure 4.

While the frequencies of "in" and "on" do increase in four of six cases after Case-marking becomes active, the increases are marginal when compared with the striking differences in the frequencies of "of" and "for". If the child were simply attending to phonological features, then there would be no reason to expect the mastery of "in" and "on" to precede the acquisition of "for" and "of", for one pair is not more phonologically salient than the other. One would expect their time of acquisition to coincide. This is clearly not the case. The acquisition of "for" and "of" as productive words does coincide, however, with the acquisition of genitive and copular constructions.

This mystery becomes clearer, however, if one considers the semantic nature of the prepositions "in" and "on". These prepositions indicate a salient spatial relationship between two objects. The prepositions "for" and "of", on the other hand, have no such function. In fact, it may be argued that their only function is to assign case to their NP objects.[6] Seen from the point of view of Case-marking then, the relatively early acquisition of "in" and "on", and the later acquisition of "of" and "for", coinciding with the acquisition of genitives, partitives

[6]One might argue that the benefactive use of "for" involves a clear semantic relationship between the verb and the object of the preposition, however this use of "for" is not the dominant use in the child's speech. Furthermore, its use is obscured by the large numbers of other uses of "for", which do not have this semantic meaning, placing yet another acquisition burden upon the child. Because of this semantic ambiguity, it seems that the child's initial hypothesis will be that "for" is not a thematic role assigner.

Name	Word	Word Frequency (%)	
		Before Case-marking	After Case-marking
Mothers	of	n/a	0.39-0.68
	for	n/a	0.44-0.53
	on	n/a	0.90-1.29
	in	n/a	1.08-1.32
Peter	of	0.04	0.13
	for	0.05	0.35
	in	1.38	1.55
	on	0.88	0.81
Nina	**of**	0.10	0.35
	for	0.01	0.51
	in	1.65	1.56
	on	1.87	2.34
Adam	**of**	0.14	0.23
	for	0.36	0.54
	in	0.96	1.27
	on	**0.86**	1.18

Figure 4: Preposition Frequency in 3 Children, Before and After Case-marking

and copulas, is entirely predictable.

Sentences (3a-b) show the D- and S-structures respectively of "The books are on the table". Following Stowell [Sto83], we postulate that, in the adult grammar, the subject "books" of the small-clause "books on the table" gets its 0-role from the predicate "on the table" and not from the verb "to be", which is thematically empty. Furthermore, "books" cannot be assigned case in situ by either the predicate or by the copula. This is consistent with Burzio's Generalization: a verb which does not assign a 0-role to its subject does not assign case to its object. Since the subject of the small-clause receives a 0-role, but not case, the sentence would violate the case filter if the subject were to remain in situ. Thus, the case filter forces movement of the small-clause subject to the position of sentential subject, where it is assigned nominative case. This assumes the analysis of Rouveret and Vergnaud [RV80] and Chomsky [Cho81] wherein nominative case is assigned by a [+tense] Infl to the subject of a sentence.

(3a) *[jp e [p* are *[p$_{rc}$d [NP* the books] *[pp* on the table]]]]
(3b) *[ip[NPi* the books] *[p* are *[p$_{re}$d U [pp* on the table]]]]

This analysis is not particular to copular constructions: it is analogous to the generally accepted analysis of passives in the adult grammar, where the passive verb does not assign case to its object or a 0-role to its subject, thus forcing movement of the D-structure object to subject position. The only difference between the two analyses is that we have shown the

copula verb as being located in IP, the maximal projection of Infl, under the assumption that the verb is being analyzed as an auxiliary—that is, as residing in the Aux node under Infl. We do this for two reasons: 1) "be" shares many properties with auxiliary verbs, such as inverting with the matrix subject, which main verbs do not possess; 2) by hypothesizing that "be" is located in Infl in the adult grammar, we have yet another reason for the paucity of copular constructions in the child's grammar at this time, since the child has not yet induced the structure of Infl.

Further evidence that the surface subject of a copular construction actually originates in object position at D-structure comes from Burzio's analysis of pleonastic elements in Italian [Bur86]. Burzio claims that the use of pleonastic "ci" (= "there") is restricted to just two contexts: ergative verbs and "essere" (= "to be"), which suggests that they are analyzed analogously—the subjects are base generated in object position and then moved leftward in the syntax. This will be discussed further in Section 4.

Minimally, a child must be able to Case-mark, assign case from a [+tense] Infl and perform NP movement in order to be able to produce copular constructions correctly. This is not to say that a child could never produce a surface string of the form "A is B" before this time, but rather that a sentence of this form would be an unproductive anomaly, possibly learned by rote, and not given an adult-like analysis, as above. If a child in the predication stage were to utter a sentence of this form, he would have to analyze some form of "be" as the head of VP (since he has no notion of Infl, by hypothesis). Given that the basic structure of a child's utterances in this stage are thematically, rather than syntactically motivated, the thematic relations in a string of the form "A is B" would be obscured by the intrusion of "is". Also given that the child already has an acceptable analysis of these strings—as simple predicates—he would have no reason to adopt the above adult analysis, involving NP movement, until he is forced to do so for some independent reason, namely the case filter.

By this analysis then, children should not be able to correctly analyze and produce copular constructions until they are able to Case-mark. Furthermore, in order for the subject, "the books", to be assigned nominative case here, there must be a properly developed Infl node (since it is Infl which actually assigns nominative case). Before Case-marking is active and Infl is properly developed, copular constructions will be produced as surface predicates, since there will be no Aux node in which the verb "to be" can be analyzed, and since nothing will force movement of the subject. In fact, the lack of subjects, Infl and Case-marking has the effect that the fundamental structure of all sentences produced by children in this stage is predication. Throughout this paper, we will refer to the stage of development prior to the development of Infl as the *predication stage.*

This observation has also been noted by Hyams [HyaS6] and Brown [Bro73] and the references cited therein. Examples of simple predication abound in the children's speech at this stage. For instance, Nina at 2-1 produced the following utterances: "all gone the coffee", "little pot down", "another plate there", "more plates in the stocking", "those my books". Brown provides further evidence for this characterization of the basic nature of a child's speech. He lists many pairs of sentences wherein the child utters a simple predicate and the mother expands the predicate to a fully grammatical sentence, and equivalently, many utterances in which the child reduces the mother's full sentence to a simple predicate.

For example, "Eve lunch" versus "Eve is having her lunch", and "Baby highchair" versus "Baby is in the highchair".

It has been hypothesized by Borer and Wexler [BW87] that A-chains are not productive at the predication stage. This, they claim, is what prevents the child from correctly analyzing, and thus producing, full verbal passives. If this is correct, then by our analysis, copulas should likewise be unproductive. Other analyses of copular constructions are possible, such as treating the copula as an ordinary verb which subcategorizes (and assigns a 0-role to) a subject and direct object rather than a small-clause. This analysis is flawed for precisely the reasons stated above—the verb "to be" is thematically empty. Presumably, the child would conclude this by observing that there is no 0-role which is consistently associated with the surface subject of the verb. Alternatively, the verb could be treated as a transmitter of a 0-role from the object to the structural subject. This analysis is less preferable than the one which we have presented on the grounds that it requires the assumption of a special piece of grammatical machinery (0-role transmission) which is not independently motivated. Consequently, we prefer the small-clause analysis, which requires no such assumption.

Furthermore, we have noted above that subjects become obligatory at the same time as copular constructions appear.[7] In contrast to Borer and Wexler then, we postulate that some NP movement, namely Spec-to-Spec movement, is productive by the time that copulas are. This follows Koopman and Sportiche [KS87] in positing that subjects are initially located in the specifier of VP, and move to the specifier of Infl. This analysis has the advantage that it requires no special assumptions about the nature of Infl. Specifically, a theory which posits that sentential subjects are base-generated in the specifier of Infl must provide a mechanism for the assignment of a 0-role to the subject through Infl. As with the alternative analysis of copular constructions, this analysis clearly has less desirable learnability characteristics than Koopman and Sportiche's—it requires the acquisition of a special purpose mechanism which is not independently motivated. If Spec-to-Spec movement is not part of the child's grammatical competence at this stage then we could not explain the distribution of the subject, with respect to auxiliaries and other material in Infl. Consequently, both of these phenomena appear to be counter-examples to Borer and Wexler's claim.

If we assume that the child cannot initially analyze copulas, and that when he does begin to analyze them, his analysis of copulas and subjects is not structurally different from the adult's then we conclude that some form of A-movement *is* productive in the child's linguistic competence by the time that Case-marking and Infl develop. [8]

The child's inability to analyze complex passives may lie in some other area, such as his inability to properly analyze passive morphology, as has been suggested by Berwick

[7]This will be discussed further in Section 5.

[8]This assumption is consistent with the Subset Principle [Ber85], which essentially claims that language acquisition must be a conservative process, and that a piece of positive evidence will always appear to refute an incorrect hypothesis put forward by the child. For instance, if the child has not adopted the correct analysis of copulas, then there will eventually be some empirical evidence indicating this. If there is none, then we must assume that the child has adopted the correct analysis, since otherwise he would never find a valid sentence which he could not analyze. Only a counterexample can force him to retract his incorrect hypothesis.

and Weinberg [BW84]. Gordon and Chafetz [GC86] have also presented evidence which suggest that children can analyze passives significantly earlier than that claimed by Borer and Wexler, even though they do not produce them at this early stage. In addition, de Villiers and de Villiers [dVdV85] and the references cited therein claim that, for a construction such as the passive, which is rare in early childhood language, the time of spontaneous production cannot be reliably taken as the time of acquisition.

The lack of Case-marking can also be held responsible for the absence of partitive and genitive constructions during the predication stage. In fact, even when imitating adult production of partitives and genitives, children commonly omit only the Case-marking feature, for example:

Mother: What's that? You've never seen one of those, have you?
Adam: Seen one those.

Mother: Are those Mommy's ears?
[Nina pulls her mother's hair over her ears to hide them.]
Nina: Mommy ears gone.
Mother: Why axe Mommy's ears gone?

A priori, there is no reason for the child to avoid genitives and partitives, and certainly the concepts of ownership and part of a whole are not beyond the child's powers of reasoning or comprehension, as the child's spontaneous (although ill-formed) productions indicate. Brown also makes this observation, and gives numerous examples of child utterances which express possessor-possession relationships. Adam and Peter, while in the predicate stage, commonly produced utterances which were clearly meant to be taken as partitives and genitives respectively:

Adam:
(4a) like a piece meat.
(4b) Mommy. Want some that.
(4c) I have part that.

Peter:
(5a) Patsy scarf.
(5b) This is Patsy. (=this is Patsy's)
(5c) Daddy car.

What is missing in these examples is the ability to Case-mark. In adult grammar, the case filter forces the presence of the preposition "of in order to properly Case-mark the noun in a partitive construction. This is obviously not part of Adam's linguistic competence at this stage. Likewise, genitive case is assigned structurally to [N", N"], that is, to a noun phrase immediately dominated by another noun phrase, resulting in the assignment of the -5 morpheme. Both Adam and Peter began consistently assigning case in a wide variety of environments in a short span of time. That is, they began inserting "of in partitives, using the *-s* morpheme in genitives and using copulas in obligatory contexts. That they

began to obligatorily assign different types of case concurrently argues against a lexical analysis of these phenomena (that is, the children were not simply learning the appropriate lexical items for various contexts), or an analysis based upon general psychological notions of increasing analytic ability. So, for instance, we could not simply claim that, at a certain point, children begin to "pay attention" to subtle phonological clues. If this were the case, then one would expect all of the common manifestations of the *-s* morpheme—possessive, plural, third person singular and some forms of the contractible copula—to be acquired more or less simultaneously. In fact, nothing could be further from the truth. Brown's [Bro73] study of the acquisition of fourteen grammatical morphemes ranked plural as second, possessive as sixth, third person as tenth and contractible copula as thirteenth. If we discard phonological and lexical explanations for the acquisition of genitives and partitives, then the only remaining feature which they share is their reliance upon Case-marking to produce their surface forms and so we are led to conclude that it is this common feature which accounts for their similar time of acquisition.

When examining the use of pronouns by children in the predication stage, they are largely correct, but mistakes do occur. For example, from sentence (1g), meaning "your pajamas", and sentence (1h) (repeated here), it is obvious that Nina has not completely classified her pronouns into distinct categories.

(1g) You jamas. You jamas.
(1h) My have more.

The only thing which distinguishes the pronoun "I" from "me", or "he" from "him" is the case which is assigned to the position at S-structure. Peter ("me make a car", "my go see her") and Adam ("see he walk", "here me comes") likewise make occasional mistakes of pronoun categorization.[9] A small amount of frequent and regular mis-categorization was, however, noted in the data. Nina, for instance, persisted in using the pronoun "my" in place of "I" (as in sentence (1h)) long after she was correctly classifying all other pronouns. She did this quite consistently, however, and so her incorrect usage is more likely attributable to a misclassification of the lexical item than due to an anomaly of Case-marking.

4 Morphological Uniformity

In order to explain the eventual obligatory inclusion of subjects and objects in the child's developing grammar, we will follow Hyams [Hya87] in appealing to the notion of a mor-

[9]The relatively high frequency of correct pronoun usage by children during the predicate stage can be attributed to the fact that pronouns form a small, closed sub-class of nouns which the child will hear very frequently, and in largely formulaic ways—that is, most utterances containing pronouns will be of the form "nominative-pronoun transitive-verb accusative-pronoun" or "nominative-pronoun intransitive-verb", and the frequency of obfuscating evidence such as "Me, I like beans" or "Mine eyes have seen the glory" will be rather small. Consequently it is not surprising that pronouns are largely used correctly. However, since the child cannot, by hypothesis, Case-mark, he will not be forced by any grammatical principle to always use the correct pronoun category. As a result, we would fully expect the child to make periodic errors in pronominal usage during the predication stage, and to make relatively fewer errors after Case-marking has matured. This prediction is borne out by our data.

phological uniformity condition, proposed by Jaeggli and Safir [JS87]. They claim that null subjects are permitted in all and only those languages which have morphologically uniform inflectional paradigms. That is, either all of its morphological forms are inflected, or none of them are. For example, Chinese is morphologically uniform because none of its forms are complex, there being no verb agreement in Chinese. In Polish, all forms are inflected (and the inflectional markings are phonologically unambiguous), and so it too is morphologically uniform. In English and French however, some forms are inflected and others are not. So, in English we have: UI walk", "you walk", but "he walks", and in French we have: "je marche", "il marche", but "nous marchons". Thus, English and French are considered to be morphologically non-uniform, and so null subjects are not permitted. Both Chinese and Polish, on the other hand, permit null subjects.

In order to adequately explain the acquisition of obligatory subjects and objects in child language, we need to propose a slight extension to Jaeggli and Safir's paradigm. We propose that the morphological uniformity parameter is actually (at least) two parameters—one for morphological uniformity with respect to subjects, and one for objects. Evidence which argues for this analysis comes from Pashto,[10] a split-ergative language spoken in Afghanistan. In the present tense, the verb agrees with the subject of both transitive and intransitive verbs. In sentences using past tense, however, the verb uniformly agrees with *objects* of transitive verbs and with subjects of intransitive verbs (which originate in object position). The morphological uniformity analysis links explicit regular agreement with optionality of deletion, thus we would expect that, in the past tense, only the subjects of intransitives and the objects of transitives may be dropped. This is exactly the situation that obtains. Consider sentences (6a-d), where the omitted argument is enclosed in square brackets. In the present tense, the subject of both the transitive "eat" and the intransitive "come" may be dropped. In the past tense, however, only the subject of the intransitive verbs and the object of the transitive verb may be dropped. Any other combination is ungrammatical. This is because Pashto is morphologically uniform, but also morphologically complex, and so agreement is a necessary and sufficient condition for an argument to be dropped.

(6a) e ra-z-i.
DIR-come-3msg
[He] comes.

(6b) e mana xwr-am.
apple eat-lmsg
[I] eat the apple.

(6c) e ra-g-ay.
DIH-come-3msg
[He] came.

(6d) ma e wa-xwar-a.
I PRF-eat-3fsg
I ate [it].

[10]Examples of Pashto are taken from Huang [Hua84].

Essentially, morphological uniformity boils down to the following principle: only remove an NP from your phonological representation when its content is recoverable. This recoverability may result from inflection, in the case of languages like Italian, Spanish, Polish and Pashto, or from discourse or sentence topics, in the case of languages such as Chinese, Japanese or Korean. One could imagine, then, a language which agrees with objects but not subjects, and which consequently allows object-drop only. Pashto must be analyzed by its speakers as morphologically uniform for subject in the present tense and object in the past tense. This assumes that in Pashto, a split-ergative language, the subject of intransitives originates in the structural direct-object position, and so in, the past tense, verbs agree with their D-structure objects, which may then optionally be deleted.

A language like Italian allows only null subjects and a language like Chinese freely allows null subjects and objects. As pointed out by Rizzi [Riz86], null objects do occur in Italian (sentences (7a-b)) and English (sentences (7c-d)), but they are not a generally available option in the grammars of either language. In Italian, null objects only occur in the environment of one of a set of valid governors—V or Infl—they only occur with selected heads (which the learner presumably has to discover item by item) and they have fairly restricted scopes of meaning—they can only be interpreted as generic pronouns. Null objects can also occur in English, but once again, only in limited environments and through a special lexical licensing process. In English, for instance, there is a lexically derived version of the verb "lead" which does not take a direct object argument in the syntax. Rizzi proposes the following rule to account for the saturation of the direct object in the lexicon: Assign *arb* to the direct object 0-role, where $^{U}arb"$ indicates arbitrary interpretation, so the direct object 0-role is given the features: [+human, -[-generic, dbplural...]. He does not adopt this solution to the Italian case, however—he posits that the null direct object is present in the syntax, because it can act as a controller, a binder and the subject of predication. None of these possibilities are available in the English case, however. Object drop is not freely available in either language, because it is not licensed by the morphology. It is only available through fairly marked licensing processes.

(7a) Questa decisione rende [tutti felici].
(7b) Questa decisione rende [____felici].
'This decision makes everyone happy.'

(7c) This leads people to the following conclusion.
(7d) This leads_____to the following conclusion.

The initial setting of the uniformity parameters for both subject and object would be [+uniform]. That is, the default assumption for a child is that his language is morphologically uniform, hence both subjects and objects can be dropped. Now, it must be remembered that null subjects and objects are only dropped in environments where their content can be recovered. Null subject languages do permit realized subjects in general, and require them to indicate emphasis or a change of topic. Consequently, we would expect children acquiring

language to optionally drop subjects and objects wherever the discourse permits it. This is, in fact, exactly what happens. The situation is particularly striking in the case of dropped objects. Consider the sentences in Figure 5.

[Peter holding slide pieces and wheel]
Peter: Fix it. Fix it.
Patsy: Fix what?
[Holding slide out to Patsy]
Peter: Fix.
Patsy: Fix what?
Peter: Fix.

Mother: Where does the ladder go?
Adam: Ladder fire truck.
Mother: Can you put it on?
Adam: Mommy put on.
Mother: Can you put them in there?
Adam: No.
Mother: I thought you couldn't do it.
Adam: No Adam do it. Ok mommy. Put ladder.
Mother: That's no ladder for that. Shall I put this back there?
Adam: Put ladder there. No put ... put belong. (= "put the ladder where it belongs")

Patsy: Bring the screwdriver and the wrench and we'll take it all apart.
Peter: Part ... put back.
[Peter puts the tire in the truck]
Patsy: Oh do you wanna put it back?
Peter: Put back.

Figure 5: Three Adult/Child dialogues

It is quite clear from these conversations and others like them that the children have a definite referent in mind when they omit direct objects. For instance, in four consecutive uses of the verb "put" by Adam, the direct object "ladder" was omitted twice and included twice. Peter similarly has definite objects in mind: a slide in his first conversation and a tire in his second.

It is not at all surprising that the child is able to drop objects. In effect, there is nothing in his grammar to tell him to do otherwise. The relative rarity of dropped objects is attributable to the relative infrequency of verbs with complex argument structures in his speech at this stage.[11] If the child during the predication stage were to omit the sole argument of a transitive verb, the result would be unintelligible—there would be no visible predication.

[11] We hypothesize that the frequency of dropped objects in verbs with complex argument structures is comparable to the frequency of dropped subjects, at this stage. However, due to insufficient data, we have not been able to test this hypothesis.

Furthermore objects are only dropped where their content is recoverable, thus rendering the utterance interpretable (and, in the child's discourse oriented system, grammatical). Until the child is able to analyze verbal affixes, he will not have the necessary mechanism to reset the morphological uniformity parameters. The development of (the Agr node in) Infl will provide the mechanism for determining the uniformity of the target language. Put another way, the lack of a separately analyzed Infl node is an indication that the child has not morphologically analyzed his language at all. Thus, once Infl has developed, the parameter should be set. In the English case, this setting would render both null subjects and null objects invalid. This accords with our observations.

Huang's [Hua84] classification of languages provides largely the same empirical results as the morphological uniformity analysis. Huang is concerned with the conditions under which subjects and objects may be dropped, and how their content may be recovered. Huang claims that a null subject (and we claim that the argument extends to objects as well) can occur where there is

> "a rich enough agreement, or when there is no agreement at all. The first case occurs in languages like Italian and Spanish, where there is an Agr rich enough to identify the content of a zero subject. The second case occurs in languages like Chinese and Japanese, where there is no Agr at all" [Hua84, p.557].

According to Huang's classification of languages, a child during the predication stage would be analyzing his language as a zero-topic, pro-drop language, or, in more familiar terms [-funiform, +D0]. Huang's second condition for null subjects—no agreement—applies to the child case, since there is, by hypothesis, no Agr node. Thus, both subject and object drop would be available to the child at this stage, as in Chinese, and as has been noted in the data (compare sentences (li-j) with (2a-b)). However, once the English-speaking child has developed Infl as an independent $\overline{X}$ node, crucially containing an Agr node, he will be able to set the morphological uniformity parameter to [-uniform], i.e., his language will be fixed as non pro-drop.

As a consequence of this, the child will be able to analyze pleonastic "it" and "there". When the child tries to use a verb which does not assign a thematic role to its subject, the setting of the morphological uniformity parameter to [-uniform] will require that an explicit (non-thematic) subject be present, since the child cannot recover the content of the subject through morphological clues. This is precisely the environment for a pleonastic element. Pleonastic elements are not barred from the child's speech by any grammatical principle before this time, but neither are they motivated by any principle of the child's early linguistic competence. Furthermore, it is the child's analysis of pleonastic elements which allow him to distinguish his language as sentence oriented, rather than discourse oriented. Huang argues that the existence of pleonastic elements is one of the distinguishing features of sentence oriented languages. This seems to be true across languages, regardless of the setting of the [iuniform] parameter. Burzio [Bur86] provides evidence suggesting that Italian and Piedmontese (a dialect of Italian spoken in the Turin area) use "ci" and "ye" respectively in much the same way that English uses "there". He provides, as evidence for this claim, examples of pairs such as (8a-b) following:

(8a) **Molti clienti sono nel negozio.**
Many clients are in the store.

(8b) **Ci sono molti clienti nel negozio.**
There are many clients in the store.

In a discourse oriented language, structural subjects are not a basic requirement of a sentence, and so a pleonastic element has no function. The analysis of pleonastics is, therefore, the evidence which would trigger an English speaking child to analyze his language as [-DO]. The range of possible values of the [iuniform] and [± DO] parameters, along with languages which exemplify these values (as noted by Huang), and the crucial triggering data[12] for acquisition are given below:

	[+uniform]		[-uniform]
	[+simple]	[-simple]	
[+D0]	**Chinese** **-no agreement** **-no pleonastics**	**Portugese** **-uniform overt agreement** **-no pleonastics**	**German** **-non-uniform agreement** **-topic deletion**
[-DO]	**n/a**	**Italian** **-uniform overt agreement** **-pleonastic elements**	**English** **-non-uniform agreement** **-pleonastic elements**

According to Huang, topic deletion only occurs in a process known as "pronoun zap" in German, as exemplified in sentences (9b-c)—the base sentence is given in (9a). In (9b-c) the verb appears in sentence initial position and some argument, either subject or object, is missing from the sentence. Since German is a verb second language, the missing argument is deemed to be deleted from topic position—this is, if the argument were present, it would reside in topic position. It is unclear what implications this has on the learnability of this particular construction.

(9a) **Ich hab' ihn schon gesehen.**
I have him already seen
'I saw him already.'

(9b) **Hab' ihn schon gesehen.**
have him already seen
'I saw him already.'

(9c) **Hab' ich schon gesehen.**

---

[12]**For the unmarked settings of the parameters, the data given is not triggering data, since there is no re-setting of the parameter, but simply the conditions under which the parameters retain their initial settings.**

There is no entry for [+simple, -DO] in the table, because we are not aware of any human language which exhibits this setting of parameters. This setting of parameters would describe a language which could not recover the content of empty categories by either morphology or discourse. Since an empty category, under these conditions, would not be interpretable, and the purpose of language is communication, one would expect speakers of this language to obligatorily use arguments everywhere.

have I already seen
'I saw him/her/it/them already.'

Further evidence for the link between morphology, the development of Infl and obligatory inclusion of null arguments comes from Lillo-Martin's study of the acquisition of American Sign Language (ASL) [Lil86]. In her study, deaf children acquiring ASL go through several telling stages of development. Initially, they use null arguments but without any related verbal morphology. In our system of analysis then, they are treating their language like Chinese—as morphologically uniform and as discourse oriented—that is, the content of null arguments is recovered by discourse determined topics. During the next stage, children use verb morphology correctly for present referents, but not for non-present referents, and use overt pronouns and a fixed word order. That is, at this stage, they have reanalyzed their language as morphologically complex (because verbs only agree some of the time, i.e., when the referent is present) and so null subjects are disallowed. Finally, the children acquire the (more complex) morphological inflection for non-present referents and, after a short period of confusion, use null arguments correctly throughout their production. At this stage, their language is, once again, being analyzed as morphologically uniform, however this time it is sentence oriented, rather than discourse oriented—that is, the content of a null argument is determined by syntactic means (agreement) within a given sentence.

5 Development of Infl

5.1 Negation

As has been noted by Brown [Bro73] and Bellugi [Bel67], the acquisition of negation in English speaking children appears to proceed in three stages. In Bellugi's stage A, the child precedes a predicate by a negation marker such as "no" or "not", presumably adjoining the negation marker to the entire predicate. For example, at this stage Adam, at ages 2-3 to 2-4, produced sentences such as (lOa-c), and Nina, at age 2-1, produced sentences such as (la-b) (repeated here). This period is characterized by an absence of subjects, modals and auxiliaries.

(la) No living room.
(lb) No hop Mommy kangaroo.

(10a) Not raining.
(10b) Not Adam night-night.
(10c) Not there.

During stage B, the child tends to correctly place the negation marker after the subject (or before the subject in questions), although the process is still unstable. Adam is 2-10 to 2-11 here. His use of "why not", as in (lie) and in many other utterances indicates that he has analyzed this as a single unit—a negative question marker, and as such, it obligatorily appears before the subject.

(lla) I not a nut.
(lib) That not a moving van.
(lie) Why not me break that one.
(lid) I can't wear it.
(lie) I no can see it.

During stage B auxiliary verbs are still rare, and when they do occur, the negation marker is often not correctly coordinated with the auxiliaries, as in example (lie). Finally, in stage C, the child achieves a competence close to the adult state, in terms of placement of negation, as well as obligatory use of subjects, modals and auxiliaries. This is exemplified by Nina's sentences (2b-d) (repeated here).

(2b) Don't put my horse on the tail.
(2c) I don't have valentine.
(2d) That's not a mane. That's a neck.

5.2 The Three Stages of Infl

The acquisition of negation is quite naturally mirrored by a progression in the development of the Infl node. We hypothesize, along with Lebeaux [Leb87] that in the predication stage, Bellugi's stage A, the child does not analyze Infl as a separate node in the $\overline{X}$ schema. Rather, inflection is analyzed either as a simple affix on the verb, or it is not analyzed at all. The basic structure of a sentence at this stage would be:

V+Aff NP

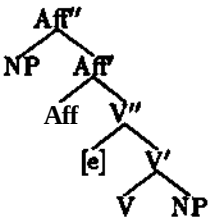
In this structure NP subjects, [NP,VP], are allowed but no principle in the child's grammar forces their presence. In particular, the morphological uniformity parameter has not been set and the case filter is not active. With this sentence structure, the child can adjoin the negation marker to the VP, as in the adult grammar, but this results in sentences like (la-b) and (lOa-c), where the negation marker is not correctly ordered with respect to the subject.

Similarly, modals and auxiliaries do not appear to be analyzed at this stage, because they are not representable in a simple predicate structure. Exceptions to this rule appear to be "can't" and "don't", which are used at the same time and in the same ways as "no" and "not". Bellugi [Bel67] noted this fact, and also noted that "can" and "do" are not productive until long after "can't" and "don't" are first used, and so concluded (correctly, we believe) that they axe being used as unanalyzed negation markers, and not as properly analyzed negated auxiliary verbs.

Gradually, by observing the regular and predictable meaning changes which coincide with a (largely) regular set of affixes, the child begins to induce affixes as distinct grammatical features. Lebeaux points out that this process is a common one in language acquisition:

> The analysis of the early verb as containing TNS or INFL, and this having later to be teased out, accords well with a more general process in acquisition: namely, that an element which is initially taken as an unanalyzed whole is later broken into subcomponents. Thus, in the context of morphology, [it] is often noted that children begin with a plural form which is correctly used (e.g. feet), later productively overgenerate a form involving the plural marker (feets, foots), and then finally return to the correct use of the form. This pattern of acquisition can be explained by assuming that the child starts out with a semantically correct, but morphologically unanalyzed form (e.g. feet, dogs)—this form is marked for plural semantically, but the plural morpheme *-$* is analyzed out morphologically and then productively used ... With respect to the verbal complex, the situation is presumably the same; the child begins with a verb which includes INFL ... but with no morphological analysis. At a later stage ... INFL is analyzed as hopping onto the verb via affix-hopping. [Leb87, p.29]

By the above arguments, we can see that much is explained by the notion that children morphologically analyze agreement facts in their language. However, the child would not necessarily jump to the conclusion that an Infl node should be posited. The child's first approximation appears to be the positing of a simple distinct affix node. By inducing such a node, the child can analyze sentences as having the following basic structure:



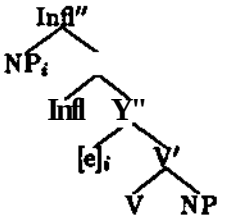
During this stage, affixes have been correctly analyzed as independent elements in a sentence to which a rule of affix-hopping must apply in order to produce the proper surface string. In addition, towards the end of this stage, some lexical material can be located in the affix node, indicating that its use is being generalized. For instance, negation markers can now be located after the subject, as in (lla-b,d-e).[13] Some auxiliaries and infinitive-marking "to" are beginning to make their first few appearances in the children's vocabularies: examples (12a-c) are from Peter at age 2-3. However, the status of Infl as a full-fledged lexical $\overline{X}$ node has still not been determined. Furthermore, as stated above, negation is often not correctly ordered with respect to main and auxiliary verbs.

[13]This idea was suggested by Robin Clark, who heard it from Ken Wexler, who attributed it to Kyle Johnson.

(12a) Goin to see Nana and Bill and Jack.
(12b) Have to do that.
(12c) I can put it to my head.

This characterization shares many properties with that of adult Chinese, which Aoun and Li [AL87] describe as possessing a degenerate Infl node. Several phenomena result: Chinese does not obligatorily require subjects of sentences (due to the absence of raising of the subject from the Spec of VP to the Spec of Infl), has no tense marking on the verb and has no subject-verb agreement, has no copular verb and has negation which closely resembles that of a stage B child (occurring most frequently just before the main verb).

The child's analysis of the verbal complex at this stage is still inadequate for the English language. Consequently, the child is forced to a new level of abstraction in stage C—that of postulating Infl as a complex (and somewhat more abstract) node—in order to accommodate the ordering of main and auxiliary verbs and negation markers, as well as the affixal information which Aff already contained. This stage involves more than a simple renaming of Aff to Infl—it involves the realization that Infl can contain lexical material other than overt morphological agreement features. Consequently, the basic sentence structure becomes *as* follows:



Due to the complex nature of Infl, auxiliaries and modals can begin to be analyzed, at this stage, as residing in Infl along with negation markers. Furthermore, case can be assigned to the raised subject of the sentence through a tensed Infl (allowing copulas to be analyzed and satisfying the case filter for subjects raised from the Spec of VP), and the infinitive marking "to" can be analyzed as residing in Infl. It should be stressed, once again, that at this stage the child has developed the mental structures necessary to analyze these constructions. He has not acquired an immediate understanding of all of the details of, for instance, the auxiliary system, the acquisition of which entails solving additional morphological and distributional problems. Our point is that before Infl has developed, there is no possibility of analyzing these constructions, and their only manifestations will be as rote learned paradigms. This explanation does not, however, explain why subjects and objects should become obligatory at stage C. A fully developed Infl *permits* the inclusion of subjects, but does not require them, and it has no effect whatsoever on objects. It is the development of Infl, which allows the morphological uniformity parameter to be set, that causes subjects and objects to be mandatorily phonologically realized in English.

6 Other Approaches

The analysis which we have presented here, if correct, stands in contrast with several other approaches to the acquisition of obligatory subjects. Both Hyams [Hya86] and Guilfoyle [Gui84] rely on the presence of a mature Infl node and Case-marking ability for their analyses. In Hyams' analysis, the phonetically empty *pro* in subject position is licensed by PRO in the Agr node of Infl, which assigns it both case and agreement features. This analysis is untenable if the child lacks the concept of a distinct Infl node. In addition, the child's ability to Case-mark, while not crucial to her analysis, cannot, by our hypotheses, be maintained. It appears that neither of these are available to the child during the null subject (predication) stage, as evidenced by his inability to Case-mark genitives and partitives, his difficulty with pronoun categories, his improper placement of negation and the absence of auxiliaries, modals, overt tense marking and infinitive-marking "to".

Guilfoyle contends that the acquisition of the [+tense] feature on Infl determines the child's acquisition of obligatory subjects. This analysis hinges on the generalization that untensed sentences lack subjects whereas tensed sentences obligatorily include them. Compare sentences (13a-c) with (13b-d):

(13a) To visit shopping malls in December is foolish.
(13b) *John to visit shopping malls in December is foolish.
(13c) John visits shopping malls regularly.
(13d) *Visits shopping malls regularly.

Guilfoyle's analysis suffers from several problems however, when considered from the perspective of our proposed framework. Her analysis assumes the a priori existence of Case-marking and Infl: she claims that NPs in Topic position receive objective case, and she only considers the acquisition of the [±tense] feature, and not the Infl structure which contains it. Another objection to Guilfoyle's analysis, however, is that it provides no obvious way to unify the other related acquisition phenomena, such as the acquisition facts of negation, copular constructions, genitives and partitives.

Lebeaux's [Leb87] analysis of subject drop, although sharing many elements with our own analysis, such as the development of Infl, relies upon two different notions of case assignment: phrase-structurally assigned case and structural case. Lebeaux contends that the child assigns case structurally to an NP in Topic position, [NP, CP], in sentential subject position, [NP, IP], or as the subject of a noun phrase, [NP, NP]. This analysis has several flaws. First, as with the above analyses, it assumes that the child Case-marks. Second, it is unclear, and never stated, what triggering data would cause the child to reanalyze and adopt an adult analysis of subject NP placement and Case-marking. Thirdly, there is no account given of why a child should ever choose to utilize the *-s* morpheme to indicate possession, since, by hypothesis, the possessor noun would already receive case structurally (i.e., by being [NP, NP]). One could possibly appeal to a notion of indirect negative evidence in order to account for the child's reanalysis of his grammar—that is, the child would never hear a possessive which did not have overt Case-marking, and so would hypothesize that it was disallowed. This is less satisfactory, however, than a theory which can explain the

facts by referring to positive evidence only. Furthermore, we are not aware of any coherent theory of indirect negative evidence which would distinguish rare linguistic phenomena, such as parasitic gaps, from incorrect analyses, such as positing structural case when genitive is required. Parasitic gap constructions consist of a trace *t* and an empty category e, both of which are licensed by some antecedent. These constructions are quite rare, and are not universally available across languages, and so one must be able to state the conditions, under a theory of indirect negative evidence, for deciding that a particular construction is rare, but grammatical, rather than simply ungrammatical. This theory must state some set of conditions under which a child could conclude that the lack of positive evidence for a phenomenon could be considered a sufficient condition for the negative setting of a parameter. Presumably, a brute-force statistical survey of adult speech by the child would not be adequate, since it could not reliably distinguish rare but correct phenomena from either rare marked phenomena or incorrect analyses.

(14a) This is the kind of food you must cook *t* before you eat e.
(14b) Which articles did John file *t* without reading e?

Finally, it must be noted that we are largely in agreement with Hyams 1987 proposal [Hya87] which links the appearance of obligatory subjects to the setting of the morphological uniformity parameter.

7 Conclusions

We have endeavored to show that the interaction between the acquisition of Case-marking through maturation, the three stage development of the Infl node and the parameters which indicate the morphological uniformity and discourse versus sentence orientation of a language account for a large number of acquisition phenomena which have been observed to occur within a short period of time. The acquisition of Case-marking alone accounts for the correct use of pronoun categories, genitive and partitive constructions. The interaction of Case-marking (and the case filter) and the development of Infl accounts for the acquisition of copular constructions by forcing the movement to subject position, providing an Aux node in which the verb "be" (and other auxiliary verbs) can be analyzed, and providing the mechanism whereby nominative case can be assigned to the surface subject (a [+tense] Infl).

This analysis also predicts the acquisition of the pleonastic elements "it" and "there", through the interaction of Case-marking and the development of Infl, as suggested in Section 4. Once Infl (containing Agr) has developed in the English-speaking child's grammar, the morphological uniformity parameter will be set to [-uniform], and so subjects will be obligatory. Consequently, when the child tries to use a verb which does not assign a thematic role to its subject, he will be forced to use a pleonastic element (since English does not have topic deletion, as in German). This, in turn, will force him to set the [idiscourse oriented] parameter to [-discourse oriented]. This accords with the acquisition facts. Hyams [Hya86] notes that pleonastic "it" and "there" are acquired at about the same time as the child begins to use subjects obligatorily, although her analysis posits that they are in fact

the trigger which causes the child to reset the null subject (or, in her terms, AG/PRO) parameter, while by our analysis, they are a consequence of the development of Infl.

Our analysis of the induction of Infl also accounts for some acquisition facts in Italian, as presented by Hyams. She notes that Italian children acquire modal verbs significantly earlier than English children, and at roughly the same time as they acquire other complex sentence forms (eight out of eleven Italian children acquire modals within two months of the acquisition of other complex sentences). English children, on the other hand, don't acquire modals until a significant amount of time after the acquisition of complex sentences (one child acquired them in three months, while two others acquired them after eight months). Hyams also notes that the copula, "essere" appears to be acquired significantly earlier in Italian. This can be explained, in our system, as in Hyams', by the fact that modals and "essere" in Italian are analyzed as main verbs, and not as auxiliaries residing in Infl, and so Italian children can analyze these verbs during the predication stage, before Infl has developed as a fully realized $\overline{X}$ node. Thus it is entirely expected that the acquisition of these verbs in Italian would precede that of English, whose learners are burdened by the requirement that copulas and modals reside in an as yet undeveloped Infl. Presumably, auxiliaries and copulas are barred from appearing in VP by thematic, morphological and ordering constraints—that is, they do not assign thematic roles, they do not have full verb morphology and they possess marked properties of subject inversion and placement of negation which full verbs lack.

The development of Infl also accounts for the stages of acquisition of negation (although the distinction of exactly three stages may be a notational convenience), as well as the appearance of other lexical material in Infl such as the infinitive marking "to", auxiliaries, modals and tense. Finally, the development of Infl provides an analysis of the resetting of the morphological uniformity parameter, which links the disappearance of null subjects and objects with the appearance of the above material in Infl.

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