

# Now you hear it, now you don't: The nature of optionality in child grammars

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## 1. Introduction

In one form or another the issue of optionality has been at the forefront of research into grammatical development for many years, especially as regards the child's use of functional elements. While the adult language may require the overt appearance of D(et) elements such as subjects and determiners and I(nfl) elements such as auxiliaries and verbal finiteness, children freely omit them from their speech. Despite the apparent pervasiveness of optional rules in early grammar, optionality is rather mysterious. Why is a rule that is obligatory in the adult grammar optional for the child? Optional rules raise problems both from a linguistic-theoretic perspective and from a learnability perspective. Linguistic theory has moved away from the optional rules of the Standard Theory (Chomsky 1965). Within current theory, optional processes are ruled out by licensing principles or by economy considerations. (Chomsky 1992). From the perspective of a restrictive continuity hypothesis, we have to ask why the child's grammar would allow such rules? Moreover, optionality raises issues of learnability: if rules which are optional for the child are obligatory for the adult, the move from the child to adult grammar runs into a potential subset situation.

In this paper I would like to explore the status of optionality in early grammar and some of the approaches to dealing with this issue. I will begin by discussing the null subject phenomenon, a kind of paradigm case of apparent optionality in early grammar. This will lead me to eventually focus on what Wexler (1994) has dubbed the 'optional infinitive stage' – the stage during which children use infinitives in root contexts alongside finite verbs – exhibiting again what seems to be a case of grammatical optionality. To anticipate where I will end up, I will attempt to argue that despite appearances, there are no truly optional processes in early grammar, at least not in the specific domain of functional categories. As we will see, different forms have different interpretive properties and hence, they are not really in free variation. I will propose that the interpretive differences arise as a result of interface principles by which the child tries to map certain semantic categories such as mood, tense, and aspect onto particular inflectional classes and I will try to elucidate one such interface principle.

## 2. Null subjects in early language

Let me begin by discussing a well known and extensively studied example of apparent optionality -- the null subject phenomenon, in which children acquiring obligatory subject languages such as English, optionally omit subject pronouns, as illustrated in (1).

- (1) a. Drop bean.
- b. Fix Mommy shoe.
- c. Go on track.

An intuitive explanation for subject omission runs as follows: Children are limited in their productive abilities, but interested in getting their message across, so they shorten their utterances by leaving out information which is easily recoverable, say, from context. In Hyams (1986) I rejected the intuitive explanation and argued instead for a grammar-based parametric account, according to which the optional expression of subjects in early language results from a missetting of a UG parameter – the Null Subject Parameter. On this view children do not omit subjects because they can't get them out. Rather, they omit them as a grammatical option. In essence, all children start out speaking Italian. The virtue of such an account was that it derived the optionality of subjects from an independently motivated UG structure. There was no appeal to special developmental mechanisms. The parametric account of null subjects ran up against a number of empirical challenges. A notable example were studies by V. Valian and associates (Valian 1991; Valian and Eisenberg 1996), which showed that English-speaking children produced null subjects far less frequently than developmentally-matched Italian and Portuguese-speaking children, and also that English-speaking children produced far more overt pronouns than would be expected from speakers of a null subject language. While frequency differences do not entail different underlying systems, these results were suggestive. More compelling evidence came from the *distribution* of null subjects in early language. Various studies have shown that in a number of non-null subject languages, there is a strong contingency between the omission of subjects and the expression of finiteness on the verb: in short, in these languages children omit subjects mainly in non-finite root clauses. Some of these results are summarized in Table 1. We see in table 1 that the subject is overwhelmingly overt in finite clauses, and overwhelmingly null in non-finite clauses. For reasons that need not concern us here, in English the contingency is less strong and also shows up in specific contexts, with the verb *be* and in *wh*-questions. The data in table 1 are directly at odds with the parametric account of null subjects since if children's null subjects were of the Italian sort, then they would show up more frequently in finite contexts – the context in which they show up in Italian and other null subject languages.

**Table 1: Proportion of null subjects in finite and non-finite clauses<sup>1</sup>**

Language	Finite V			Non-finite V			Total n
	Child	Overt	Null	Total n	Overt	Null	
Flemish	Maarten 1;11	75%	25%	92	11%	89%	100
German	Simone 1;8-4;1	80%	20%	3636	11%	89%	2477
German	Andreas	92%	8%	220	32%	68%	68
French <sup>a</sup>	Philippe 2;1-2;6	74%	26%	705	7%	93%	164
French <sup>a</sup>	Nathalie 1;9-2;3	70%	30%	229	27%	73%	180
Dutch	Hein 2;3-3;1	68%	32%	3768	15%	85%	721
English <sup>b</sup>	Eve 1;6-2;3	100%	0	149	--	--	--
English <sup>b</sup>	Adam 2;3-3;0	89%	11%	186	--	--	--
English <sup>b</sup>	Nina 1;11-2;4	96%	4%	69	--	--	--
English <sup>c</sup>	Adam	51%	49%	204	6%	94%	113

<sup>a</sup> includes only preverbal subjects

<sup>b</sup> includes only the verb *be*

<sup>c</sup> includes only *wh* questions

On the contrary, however, it seems that for the languages represented in table 1, children's null subjects are licensed mainly in the context of infinitives, such as those illustrated in (2).<sup>2</sup>

- (2) a. Zahne pussen                      German  
Teeth brush-inf.  
b. Dormir tout nu                      French  
Sleep-inf. all naked  
c. Niet neus snuiten.                  Dutch  
Not nose blow-inf

The data in table 1 also provide no comfort for the production limitations/recoverability account outlined earlier. If anything, such an account would predict that the additional complexity induced by the use of a finite agreeing verb should increase both the processing load on the child and the recoverability of the subject, making it much more likely for the subject to drop when the verb is finite. The contingency shown in table 1 casts the issue of optional subjects in a new light; subjects are not in fact optional in early

grammar. Their occurrence is dependent on the finiteness of the verb. In restricting null subjects to non-finite contexts, children are adhering to a universal licensing principle, the same principle which allows null subjects in subject position of an infinitive in adult languages, as in (3).

- (3) a. \_\_\_ to work in my garden is a delight.  
 b. I love [\_\_\_ to work in my garden]

Thus, the distribution of null and overt subjects in the child's grammar, though not a matter of parameter missetting, as originally hypothesized, does illustrate that early grammars respect the licensing principles of UG. We've now traded in our old question -- why do children optionally omit subjects, for a newer one, namely, why do children allow infinitives in root clauses where adults do not, or do so significantly less often and in more restrictive situations?

The root infinitive phenomenon has been widely observed. Some of the languages that show an RI-type phenomenon are listed in table 2. The stage is alternately referred to as the 'root infinitive stage' (Rizzi 1994) or the 'optional infinitive stage' (Wexler 1994), which is intended to reflect the fact that children also use inflected finite verbs during this period.

**Table 2. Frequencies of RIs in child languages**

Type	Language	Frequency	Children	Age	Source
RI	French	37%	3	1;8-2;6	Pierce 1992
RI	German	43%	1	2;1-22	Guasti 1994
RI	Dutch	56%	4	1;8-2;4	Weverink 1989 Haegeman 1994
RI	Icelandic	36%	1	2;0-2;3	Sigurjónsdóttir 1999
RI	Swedish	51%	2	1;8-2;2	Guasti 1994
Bare verb	English <sup>a</sup>	78%	3	1;6-3;0	Hoekstra & Hyams 1998
Bare subj.	Greek	70%	4	1;8-1;11	Stephany 1981

<sup>a</sup>Only sentences with 3rd person singular subject are included.

English speaking children also show an optional use of finite morphology, as illustrated by examples such as those in (4).

- (4) a. Cowboy Jesus wear boots.  
 b. Eve sit floor.  
 c. Ann need Mommy napkin.

Wexler (1994) argues that such cases are the English analogue of the RI phenomenon. The empirical evidence supports the claim that this is indeed a non-finite form, but as I will discuss below, there are important and interesting differences between the English bare form and the true infinitives found in the other languages listed.

### 3. Accounts of Optionality

Let me now consider several approaches to dealing with the problem of optionality. One possibility is that optionality is the effect of not knowing the relevant grammatical rule. This was, in effect, Cazden's (1968) and Brown's (1973) position in setting up a 90% criterion level for acquisition and is adopted in some more recent work, for example, in Clahsen et al (1996) in their work on the acquisition of functional structure in early German: In these studies it is assumed that until the child supplies a functional element in 90% of obligatory contexts, she or he does not really have the rule. But as Brown noted, equating 90% use to "knowledge" is rather arbitrary. Children may "know" the rule at the 40% or 50% or 60% use level and in fact it is significant that the use of grammatical morphemes at any frequency level is nearly always correct. The 3rd person singular *-s* is a case in point. Although *-s* is frequently omitted (cf. table 2), when it is used, it occurs almost exclusively in 3rd person singular contexts. (eg. Harris and Wexler 1996). Similarly, past tense *-ed* is often omitted, but when it does occur, it correctly denotes a past event (eg. Harris and Wexler 1996; Madsen and Gilkerson 1999). The point can be made even more forcefully with the verb *be*, which has a richer paradigm. *Be* is often dropped in copula and progressive constructions. According to our analyses, however, when it occurs, agreement is virtually always correct.<sup>3</sup> Also, as Becker (2000) shows, the rate of omission of *be* in copula constructions is largely contingent on the event properties of the predicate, with omission rates in stage level predicates far outnumbering rates in individual level predicates. If children did not have the relevant grammatical rule until they reached 90% criterion, their use of *be* and the tense morphemes should be completely random, which it clearly is not.

An alternative approach to optionality is to say that children have the relevant rules, but that their implementation is hindered by one or another performance factor (eg. Bloom 1990). The problem with performance-based accounts is that they fail to capture various distributional facts and contingencies such as the relation between subject omission and finiteness discussed above. (cf. Hoekstra and Hyams 1998 for overview of relevant findings and Hyams and Wexler 1992 for critique of performance models of subject omission).

Perhaps the most widely held view of optionality these days is what I'll call the 'optional rule hypothesis'. According to this view, there is no performance problem. Rather, children simply have optional rules (either for grammatical or pragmatic reasons) and they may differ from adults in this respect. There are many different implementations of this basic idea. I have argued that children may leave functional heads, such as I and D, underspecified and that this results in a lack of finiteness (RIs) in the verbal domain and a lack of specificity (subjects, determiners) in the nominal domain (Hyams 1996, Hoekstra and

Hyams 1996). Among the various proponents of underspecification, there is disagreement about which functional head or heads may be left unspecified, number (Hoekstra and Hyams 1996), tense (Wexler 1994) AGR and tense (Schütze and Wexler 1996), an undifferentiated F(initeness)P (Clahsen et al. 1996) head, but the basic idea is that if there is not a full specification of functional features, then no temporal anchoring can be established and the clause is non-finite. In a somewhat different approach, Rizzi (1992), has argued that children have the option not to project a full CP structure and may truncate lower down in the clause; a structure truncated below TP results in a non-finite clause. Boser et al. (1992) have argued for an analysis of early German according to which RIs and other apparently non-finite clauses contain a null auxiliary. On their account, what is optional in early grammar is the phonological realization of a finite AUX. While the underspecification, truncation, and null aux accounts diverge in important respects and make different empirical predictions, they share the core notion that in the child's system some grammatical rule or other is optional, and hence, that root infinitives are essentially equivalent to the corresponding finite form but for the specification of the functional material.

A rather different approach to optionality is offered by optimality theory (OT). In a recent paper, Legendre et al (2000) propose an OT account of RIs in French. According to OT conflicting constraints determine the grammatical structures of language. In the case of the child, there is a competition between constraints requiring 'faithfulness' to the adult input, that is, a specification of tense and agreement, and constraints that prohibit functional structure -- markedness constraints. The optionality in the child's grammar is captured by having a variable ranking between the faithfulness constraints and the constraints prohibiting structure. So, when the faithfulness constraint outranks the markedness constraint, a finite form emerges, and when the markedness constraint wins out, the non-finite form surfaces. The OT approach is reminiscent of Valian's (1991) 'competing-grammars account' of null subjects -- where children waiver between a null subject and a non-null subject grammar. And it also shares a number of properties with Wexler's (1998) 'unique checking constraint' account of RIs, in which a constraint against checking more than one functional head competes with a constraint requiring the child to minimize violations.

There are 3 kinds of challenges to the optional rule hypothesis, as well as to the OT-type account: a conceptual challenge, why does the child's grammar allow optionality where the adult's generally does not; a learnability question, how is this optionality unlearned; and finally, an empirical issue, which is that these accounts predict that the different clauses are essentially in free variation, by which I mean the different structures have the same meaning. In what follows I will focus on the empirical question. I will show that the different forms -- finite and non-finite -- have different interpretive properties and hence that there is not really true optionality.<sup>4</sup>

#### 4. The aspectual and modal properties of root infinitives: Evidence from Dutch and other RI languages

Let me begin by discussing certain aspectual and modal properties of root infinitives in Dutch and other languages that show an RI stage. Since there is a lot of terminological confusion in the literature, I want to be very clear that the term RI as it is used herein refers to forms that have overt infinitival morphology. Thus, I am not referring to stems, participles, or other forms which may be non-finite, but which are not infinitives. I will have more to say about the English bare form and bare participles below.

There are two notable semantic properties of RIs that distinguish them from finite forms occurring during this same period. The first is that RIs are typically irrealis in that they express deontic or volitional modality, that is, necessities and desires. Finite forms, on the other hand, are realis and have a temporal value. The second property of RIs that distinguishes them from finite forms is an aspectual one: RIs are restricted to eventive predicates, while finite verbs can be either eventive or stative. In Hoekstra and Hyams (1998) we discuss these two properties in detail and argue that they are related.<sup>5</sup> In this paper, I will restrict my attention to the modality issue since that is most relevant to the topic of optionality.

The modality of RIs was first noted by Van Ginneken (1917), and numerous studies confirm this finding, (eg. Hoekstra and Jordens 1994; Wijnen 1996). Wijnen provides quantitative data from early Dutch, given in table 3.

**Table 3. Temporal/modal reference of RIs and finite forms in 4 Dutch children (Wijnen 1996)**

	Present	Future/Modal	Past	Total
RI	194 (10%)	1625 (86%)	64 (3%)	1883
Finite	657 (93%)	21 (3%)	21 (3%)	699

We see in table 3 that 86% of the Dutch RIs have a modal reading. Hoekstra and Hyams (1998) formulate this finding as in (5).

(5) *The modal reference effect (MRE)*

With overwhelming frequency, RIs have modal (irrealis) interpretations.

As noted above, these RIs generally express necessities and desires. The meaning of the RI sentences is inferred from the linguistic and non-linguistic context of the utterance. Examples are given in (6) (from Wijnen 1996).<sup>6</sup>

- (6) a. Eerst kaartje kopen!  
 first ticket buy-INF  
 'We must first buy a ticket.'

- b. Niekje buiten spelen.  
Niekje outside play-INF  
'Niek (=speaker) wants to play outside.'
- c. Papa ook boot maken.  
Papa also boat make-INF  
'Papa must also build a boat.' or 'I want Papa to build a boat'

Now notice that the finite forms in table 3 do not express modality, but typically have a deictic interpretation, overwhelmingly present tense.

In Hoekstra and Hyams (1998) we argue that the modality of the RI comes from the infinitival morpheme (and is not due, for example, to a null modal in the structure.). We propose that the infinitival morpheme has an irrealis feature associated with it and this forms the basis for the modal interpretation.<sup>7</sup> Evidence for this proposal is of three sorts.

First, we find that RIs have a modal meaning not only in Dutch, but also in Swedish as reported by Plunkett and Stromqvist (1990), French, as reported by Meisel (1990) and Ferdinand (1996), de Cat (p.c.), German, as reported by Becker and Hyams (1999), Ingram and Thompson (1996), Lasser (1997).<sup>8</sup> These are all languages that have distinct infinitival morphology. Second, there is evidence that the modal meaning of Dutch RIs emerges at the point at which children first identify the infinitive as an infinitive. Blom and Wijnen (1999) show that the MRE emerges just as children begin to use finite forms alongside RIs, arguably the point at which they recognize the internal structure of infinitive, as distinct from the finite forms. Lastly, we find that in a language that does not have an infinitival affix, namely English, non-finite forms do not have modal meaning. A number of people in our lab at UCLA have been investigating the interpretive properties of early English bare and finite forms, among them Kamil Ud Deen, Harold Torrence, Shannon Madsen and Jill Gilkerson. An important finding, reported in Hoekstra and Hyams (1998), is that the English bare form used by children typically has a temporal, rather than modal interpretation. The verbs refer to present or past events. This is in marked contrast to the situation in Dutch and other RI languages. The relevant data are presented in tables 4 and 5. Table 4 presents the results of several files of Adam and Eve. We see that only 13% of the English bare forms have a modal interpretation as compared to the 86% in Dutch (cf. table 3). The bare forms have mostly a temporal interpretation, with 'present' being the most frequent.<sup>9</sup>

**Table 4. Temporal/modal reference of bare and finite forms in English: Adam and Eve (based on Ud Deen 1997)<sup>10</sup>**

	Past	Present	Future/Modal	Total
Bare	59 (22%)	171 (65%)	34 (13%)	264
Finite	33 (37%)	46 (51%)	10 (11%)	89



Examples from each temporal category are given in (7).

(7) *Present*

- a. Adam write pencil. (while writing on someone's pen)
- b. Dat a turn (while turning a ring on someone's finger)

*Past*

- c. Child: Bite me and big doggie bite me  
Adult: The fish bit you and the cowboy bit you and a big doggie bit you.  
Child: Yeah.
- d. Child: Robin break it, your pen.  
Adult: No, he didn't break it.

*Future/Modal*

- e. Read # Mommy read (handing mother the book)
- f. Adult: What do you want?  
Child: Sit up. Sit up. Baby sit up.

These results are replicated in the study of Nina and Naomi, as shown in table 5.

**Table 5. Temporal/modal reference of bare and finite forms in English: Nina and Naomi (based on Madsen and Gilkerson 1999)<sup>11</sup>**

	Past	Present	Future/Modal	Total
Bare form	28 (25%)	70 (64%)	10 (9%)	108
Finite form	86 (56%)	66 (43%)	1 (1%)	153

The overwhelming majority of bare forms have a temporal interpretation, either present or past, while only 9% have a modal interpretation. Again, this is in marked contrast to the Dutch results reported in table 3.

To sum up, in languages with true morphological infinitives, such as Dutch, RIs differ from finite forms in their interpretation. RIs have mainly a modal or irrealis interpretation expressing wishes, necessities or future eventualities, while finite forms have a realis/temporal interpretation and usually denote on-going events. We have argued that the modality of the RIs comes from the infinitival morpheme. Since the English bare form is not a true morphological infinitive, it follows that it does not carry modal meaning.<sup>12</sup> The relevance of these observations to our discussion of optionality is two-fold: The first point is that the English bare form is not exactly equivalent to RIs, though it does share certain properties with RIs (a point I will return to). By our hypothesis, the infinitival morphology (or lack thereof) yields different interpretive properties. The second point is that in Dutch and similar languages RIs and finite verbs are not simply morphosyntactic variants of each other since they mean different things. RIs are not a free option for children, but are rather semantically selected

in some way. This result raises an interesting question for English: Is the English bare form simply a phonological or morphosyntactic variant of the finite form? A priori this hypothesis is not implausible given that the English affixes are phonologically weak forms and might simply drop for that reason. Moreover, the data in tables 4 and 5 show that the bare and finite forms distribute alike with respect to their temporal properties. They have mainly present and past tense reference with just a small smattering of modal cases. Prima facie, these results seem compatible with the optional rule hypothesis. So the question arises, do the English-speaking child's finite and bare forms really have the same aspectual and or temporal properties?

## 5. English Bare Form

Before I turn to the results of this investigation, let me diverge briefly to discuss an idiosyncratic property of English verbs. As is well known, there is an interesting aspectual restriction on the English verb, which is that it cannot denote ongoing events. Thus, the sentence in (8) is grammatical only on the habitual interpretation.

(8) John reads the paper every day/\*now.

In this respect English differs from the other Germanic languages and the Romance languages, whose present tense can denote either habitual activities or ongoing events, as illustrated in the Italian and Dutch examples in (9).

- (9) a. Gianni legge il giornale tutti I giorni/ora.  
'John reads the paper every day/now.  
b. Jan leest de krant elke dag/Jan leest nu de krant.  
'John reads the paper each day/John reads now the paper.'

There are various semantic accounts of this property of English. Of particular interest is Giorgi and Pianesi's (1997) claim that the English verb is inherently perfective, that is, the verb denotes both the process part of an event and also its completion.<sup>13</sup> Giorgi and Pianesi further assume that the speech event that gives rise to an utterance is punctual (or instantaneous). Since perfectivity entails the closure of the event described by the verb, it cannot be simultaneous with the punctual speech event and hence there can be no ongoing interpretation. They formulate this as the *punctuality constraint*, given in (10).

- (10) *The punctuality constraint* (Giorgi and Pianesi 1997)  
A closed event cannot be simultaneous with a punctual event

In investigating the meaning of children's bare and finite forms, it is thus relevant to ask whether children respect the aspectual restriction on English verbs, that is, do they use eventive verbs with only a habitual interpretation. Depending on the results, we can then make certain inferences about their knowledge of the perfectivity of the English verb, and also about how the

punctuality constraint operates in early grammar. Importantly, Giorgi and Pianesi's claim is that the perfective feature is part of the verb and not its morphology; thus both finite and bare forms should be habitual, according to their analysis. Torrence (2000) analyzed Adam's files between the ages of 3;2 and 3;5 to determine whether the verb denoted an ongoing event or habitual activity (see note 9). Several examples of sentences with habitual readings are given in (11). Examples of ongoing reference were given in (7a-b).

- (11) a. Paul always get off blanket (Adam 29)  
 (talking about Paul who has crawled off the blanket)
- b. Adult: When the snow is high, you can clear the streets.  
 (talking about snowplows)  
 Adam: Dat push it. (Adam 25)
- c. Adam: Robin break it, your pen. (Adam 28)  
 Adult: No, he didn't break it.  
 Adam: Robin always be naughty when he break pens.

The results in table 6 show that Adam's verbs, whether finite or bare, generally had a habitual interpretation, as is correct in the adult language.

**Table 6. Ongoing vs. habitual interpretation of bare and finite (-s) eventive verbs in English (Adam 3;2-3;5) (based on Torrence 2000)**

	Bare form	Finite (-s) form
Ongoing	5 (20%)	2 (3%)
Habitual	20 (80%)	55 (97%)
Total	25	57

However, it is noteworthy that a bare verb was much more likely to receive an ongoing interpretation than a finite verb. Only 3% of Adam's finite verbs referred to ongoing events while 20% of the bare forms did.

This analysis was repeated for Nina and Naomi and the results given in table 7. We find the same split that we see in Adam in table 6, but the differences between bare and finite forms are much more dramatic. The finite eventive verbs (present tense -s form) have a habitual interpretation about 88% of the time. On the other hand, the bare eventive verbs most often -- that is, 83% of the time -- have an ongoing interpretation.

**Table 7. Ongoing vs. habitual interpretation of bare and finite (-s) eventive verbs in English (Nina 2;4-2;9; Naomi 2;1-3;3) (based on Madsen and Gilkerson 1999)**

	Bare form	Finite (-s) form
Ongoing	24 (83%)	3 (12%)
Habitual	5 (17%)	26 (88%)
Total	29	29

Nina's files were from age 2;4 to 2;9 and Naomi's files from age 2;1 and 3;3. We reasoned that Nina and Naomi showed the difference more strongly because they were at an earlier developmental stage than Adam. To confirm this hypothesis, we looked at Adam's files at an earlier point. The result is rather striking: the younger Adam's bare forms overwhelmingly denote ongoing activities (91%). Table 8 presents the breakdown of ongoing vs. habitual interpretation of eventive bare verbs for the younger Adam from age 2;3 to 3;1.

**Table 8. Ongoing vs. habitual interpretation of bare eventive verbs (Adam 2;3-3;1) (Ud Deen, p.c.)**

Ongoing	43 (91%)
Habitual	4 (8%)
Total	47

So what do the English data tell us? Putting aside Adam's later stage in table 6, which I have nothing to say about at this point, what we see during the earlier period is that there is a clear aspectual difference between the finite and bare forms. The finite form is typically habitual, while the bare form refers most often to ongoing activities.<sup>14</sup> We can conclude for English, as we did for the RI languages, that since the finite form and bare form have different interpretations, they are not simply phonological or morphosyntactic variants of each other.

What inferences can we make concerning the children's knowledge of the perfectivity of the English verb? This is difficult because our results are mixed. The children seem to know that the verb is perfective in the finite case, assigning these verbs a (correct) habitual interpretation. But they seem not to know about the perfective feature in the bare verb case, thus allowing an ongoing interpretation. But this is an impossible result under Giorgi and Pianesi's hypothesis since perfectivity is a feature of the verb itself and should therefore block the ongoing meaning in both the bare and finite forms. I will maintain that young English-speaking children do indeed know that the English verb is perfective; if they did not have this knowledge, then we would expect them to use the finite form to denote ongoing activity as frequently as the non-finite form, contrary to fact. This suggests that they have already learned the aspectual value of the English verb. But we must then explain why this restriction seems to disappear with bare verbs. I believe the answer to this puzzle lies in the role that the punctuality constraint plays in the early grammar and its interaction with finiteness.

## 5.1 The perfectivity of the English verb

First, let me lay out certain assumptions I am making about how temporal relations are grammatically represented and how the punctuality constraint operates on these representations. As is standard, I assume that in finite sentences the event described by the verb is temporally anchored relative to speech time. The temporal value is determined by linking the Verb+tense complex to a Reference time located in Comp and the value of C/Ref is determined by a discourse operator in the CP specifier position. In the unmarked case the operator is deictic, and it determines the value of Ref to be the current interval - the Now. The event described by the verb is situated either at the current interval yielding a present tense, or prior to it, yielding past tense. This linking (of V to T to the C domain) can be simply represented as a 'tense chain', as proposed in Guéron and Hoekstra (1995), shown in (12).

(12) [CP OP<sub>i</sub> [C Ref<sub>i</sub>] [IP<sub>...</sub> [V+tns]<sub>j</sub>.....]]

If we take the punctuality constraint as a constraint on tense chain formation (or whatever derives the effect of linking the event to speech time), we have an explanation for why children's finite clauses do not denote ongoing events -- for the same reason that the adult present tense sentences cannot denote an ongoing event -- the punctuality constraint blocks the grammatical linking of the event time to the speech time, that is, it blocks formation of a tense chain. But what about children's bare verb structure? Why is the ongoing reading not blocked in this case? In Hoekstra and Hyams (1996, 1998) we propose that children's non-finite root sentences are not temporally anchored through the grammar, that is, there is no tense chain. If there is no tense chain, then there is no representation for the punctuality constraint to operate on. Thus, bare verbs are free to refer to past events as well as ongoing events, which is indeed what we find.

So let us sum up where we are so far. I have discussed two properties related to children's use of non-finite forms. First, the non-finite forms used by children acquiring different languages have different interpretations -- modal or irrealis in the case of the RI languages and temporal or realis in the English case. I have argued that this is a function of the different morphological composition of the non-finite forms -- the presence vs. absence of an infinitival affix. Importantly, however, RIs and the bare form share a fundamental property, which is that they are not temporally anchored through a tense chain, thus supporting Wexler's (1994) hypothesis that there is a relationship between the English bare verb and the RIs found in other languages. The last finding is that internal to a particular language, the non-finite structure differs from the finite structure in its modal or aspectual value. Because of this, we cannot assume that the use of non-finite forms by young children is simply the result of an optional morphosyntactic or phonological process. Rather, the non-finite forms have their own compositional semantics determined by the specific morphology of the non-finite form and the structure, in particular the absence of a tense chain or temporal anchoring. In the case of RIs, the lack of a tense chain allows the inherent modality of the infinitive to emerge, and in the case of the English bare

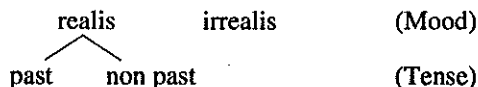
form, the absence of a tense chain voids the effect of the punctuality constraint, allowing a kind of free temporal reference.

If, as I am arguing, the early non-finite forms are not the result of an optional grammatical process, how do we explain their occurrence? In the remainder of this paper I would like to address this question, and offer a different approach, one which views the phenomenon not strictly in morphological or syntactic terms, but rather places the problem at the interface of morphosyntax and semantics. I will propose that the alternation between finite and non-finite root clauses is not a case of true grammatical optionality, but falls out of the child's attempt to set up a system of semantic oppositions and map them onto morphological forms. This is very much a work in progress so I will probably raise many more questions than I answer.

## 6.0 The semantic opposition hypothesis

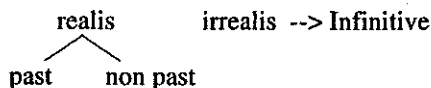
As point of departure we can ask the question: how do children learn the meanings of the different inflectional morphemes in their language? Languages, do vary in the kind of relations encoded by morphology, whether tense, aspect, mood or some other relation, and children need to somehow figure out how these semantic categories are encoded in the morphology of their language. While I don't have at this point anything like a strict learning algorithm, I would like to propose more informally that children map meanings onto I elements according to a semantic hierarchy in which *mood* represents a primitive opposition, or the most primitive, opposition. The first opposition, then, is one between irrealis mood – that is, desire or necessity or futurity of some event -- and realis mood, that is, the actual occurrence, whether past or ongoing, of some event. Within the realis category there is a tense opposition - past vs. non-past. We can represent this schematically, as in (13).<sup>15</sup>

### (13) SEMANTIC OPPOSITION HIERARCHY



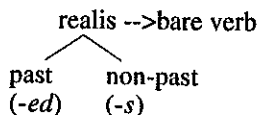
With respect to children's use of non-finite forms, I would like to propose specifically that this falls out of the attempt to fix a realis-irrealis opposition, or to adopt Lyon's (1977) terminology, an *it is so* vs. *so be it* opposition. This is most obvious in the RI languages, where the RI is an irrealis or *so be it* form, and the finite verb has a realis or *it is so* interpretation, either past or non-past depending on its morphology. We can represent this state of affairs as in (14).

### (14) RI LANGUAGES



The English situation is slightly different. The absence of infinitival morphology means that the bare verb will not be categorized by the child as an irrealis form, in contrast to the situation in languages such as Dutch. I would argue that the English bare form is a pure realis form, without any further temporal specification. The finite forms in *-s* and *-ed* mark a tense opposition, as represented in (15).

## (15) ENGLISH



But what does it mean for the bare verb to be a pure realis form? To answer this, I will take my lead from some observations of Comrie (1985) who notes that there are languages such as Burmese and Dyrbal that do not have tensed clauses. Rather, clauses are marked for Mood, the basic opposition being realis -- irrealis. In these languages, the realis form is used for present or past temporal reference (with the help of adverbials, eg. *yesterday*, *today*, *Saturday*, etc. and context and real world knowledge) and the irrealis form expresses modal meanings, that is, reference that is not to the actual world. In such languages there is a modal operator in the CP domain that creates intensional contexts (desire, necessity, etc.). Given the existence of such languages, it is clear that this is an option available in UG and hence to the child. I am suggesting, then, that the English bare form is a pure realis form in this sense. In contrast to the finite forms, which are *temporally* anchored through a tense chain (hence subject to the punctuality constraint - cf. (10)), the bare form is realis but has no specific temporal reference.<sup>16</sup>

If the bare form is a realis form, then what is it opposing irrealis form? If the most primitive opposition is a mood opposition, we expect that English (as well as other languages) will have irrealis forms that stand in opposition to the realis ones. In this regard it is interesting to observe that prior to the emergence of the English modals (*can*, *must*, etc.), children use the semi-auxiliaries *hafta* (have to), *gonna* (going to), *gotta* (got to), and *wanna* (want to) (Bellugi 1967; Menyuk 1969), as in the examples in (16).

- (16) a. I hafta eat my ice cream. (have to)  
 b. Wanna go playground, (want to)  
 c. I gonna get it. (going to)

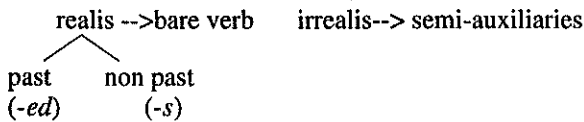
The semi-auxiliaries are used during Bellugi's period B – a stage that in current terms we would identify as the RI or bare verb stage. I would argue that sentences such as those in (16) are functionally equivalent to RIs in Dutch and German in that they express irrealis mood and thus stand in opposition to the realis forms.

It is also worth noting that the semi-auxiliaries incorporate the morpheme *to*, which is the element used to compose the English infinitive. Like the morphological infinitive in the Romance and Germanic languages, the English infinitive formed with *to* has a prospective or unrealized value (cf. Stowell 1982; Duffley 1992 a.o.), as in the examples in (17). In the sentences in (17) the *leaving* and the *dog-walking* are subsequent to the *wanting* and *remembering*.

- (17) a. John wanted Mary to leave.  
 b. Michael remembered to walk the dog.

It is plausible that the irrealis meaning associated with the *to* infinitive comes from *to*, which is why this meaning is lacking in the bare verb. Bloom et al (1984) argued that for children, infinitival *to* is in construction with the higher verb rather than the lower verb. The analysis I am proposing is consistent with this view, and I would add that that fact that *to* is incorporated into the higher verb in examples such as those in (16) provides the basis for the classification of these forms as irrealis. So a more complete schema for English is as shown in (18).

(18) ENGLISH



There is a final point I would like to address, which concerns the universality of the semantic opposition hypothesis and the schemata just presented. The semantic opposition hypothesis is an interface condition mapping semantic primitives onto morphological forms. As such, it should be universal and not tied to any one kind of inflectional system. Consider in this regard, Greek.

### 6.1 Greek bare subjunctives

Greek is a language without an infinitive and yet Greek children produce a form -- illicit in the adult language -- which shares many of the properties of RIs. Stephany (1981, 1986) and more recently Varlokosta et al (1998), note that Greek children frequently produce utterances such as (19).

- (19) Plo vavási                      (Stephany 1986)  
 Spiros read

Varlokosta et al. (1998) argue that such utterances are non-finite and should be analyzed as bare participle constructions, analogous to the Italian construction illustrated in (20).



- (20) Presa Checco campana  
 taken Checco bell  
 'Francesco has taken the bell'

Indeed, the verb in (19) 'vavási' is phonologically ambiguous between a participle, as in (21a) and the perfective form found in subjunctive and future clauses, as illustrated in (21b). These are examples from the adult language.

- (21) a. O Spíros exi *ðiavási* (adult sentence)  
 'Spiros has read'  
 b. O Spíros *tha/na ðiavási* (adult sentence)  
 the Spiros future/subj read-perfective present 3rd sing.  
 'Spiros is going to/wants to read'

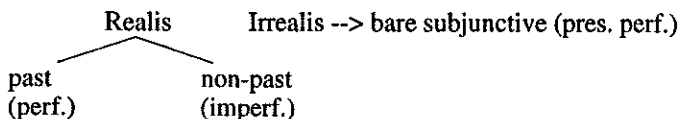
According to Stephany (1981, 1986) and more recently, Baltazani (1997), the interpretation associated with utterances like (19) is clearly modal or irrealis, expressing intentions, wishes, and obligations. Thus, with respect to interpretation, it is very close to the Dutch RIs (and the English semi-auxiliary constructions) but very different in fact from the Italian bare participles, which generally describe perfective or closed events (Antinucci and Miller 1976). Stephany claims that at the earliest stages of Greek acquisition children have two classes of verbal utterances, those which describe ongoing and past events, for which children use the present imperfective and past perfective forms respectively, illustrated in (22) (examples from Stephany 1981).

- (22) a. *bèni ató* (= *bèn-i aftó*) (Ongoing)  
 go-in-imp.3S. this one  
 'This one goes in'  
 b. *bíke* (= *bík-e*) (Past)  
 go-in-perf.3S  
 'It has gone in'

Opposed to these are utterances that have modal meanings, such as the example in (19), for which children use the present perfective form of the verb. It is important to note that the present perfective form of the verb when it is unsupported by a future or subjunctive particle is not well formed in the adult language. In this respect it is like the other root non-finite forms discussed thus far.

It is easy to see how the categories described by Stephany fit into the semantic opposition hierarchy proposed. As schematized in (23), the past perfective and present imperfective are realis or *it is so* forms expressing a past - non-past opposition, as in the adult language. These are licensed through a tense chain. The "ungrammatical" present perfective form (what I will call a *bare subjunctive*) expresses irrealis or *so be it* mood. It is temporally unanchored and is licensed through a modal operator, like the RI and the English semi-auxiliaries.<sup>17</sup>

## (23) GREEK



A central concern of Varlokosta et al. (1998) and the reason that they analyze the irrealis form as a participle is that in sentences such as (19) the verb often fails to agree with the subject. The verb often occurs with the 3<sup>rd</sup> person *-i* ending, though the intended subject is 1<sup>st</sup> person. An example is given in (24).

- (24) Pàri γυγυνάκι  
 Take-perf. 3<sup>rd</sup> sing. Piggy  
 'May I take the piggy?'

Indeed, the rate of agreement errors in Greek is a whopping 30-40% and is found almost exclusively in such utterances. These results are quite out of line with other child languages, where the rate of agreement error is under 4% by most counts (cf. Hoekstra and Hyams 1998 for discussion). The lack of agreement is not surprising if the verb is a participle, as Varlokosta et al suggest, since participles do not inflect for person, but it is unexpected if the verb is a subjunctive form – which in the adult language is an agreeing form. As noted earlier, however, the interpretive facts strongly favor the irrealis or bare subjunctive analysis over the participle analysis. How then can we reconcile the bare subjunctive analysis with the agreement facts? According to the analysis proposed here the structures in (19) and (24) do not involve a tense chain. Since there is no tense chain, agreement is not licensed and the verb appears in the default 3<sup>rd</sup> person form. This explains the extraordinary behavior of Greek with respect to agreement.<sup>18</sup>

Obviously, much more work needs to be done before the question of universality can be adequately tested. But the Greek results are significant: if we are finding RI-type effects in a language that does not have an infinitive, this tells us that the phenomenon is not tied to any particular type of inflectional paradigm and that it cannot be described in strictly morphosyntactic terms, but rather reflects deeper organizational principles.<sup>19</sup> The semantic opposition hypothesis places the phenomenon at the interface of semantics and morphology: Universal semantic oppositions find their realization in the specific morphology of a language. We thus expect the semantic oppositions to play out differently in typologically distinct languages.

## 7.0 Concluding remarks

We began by questioning whether the omission of functional elements in early grammar is really an optional process. I have argued that it is not, that the apparent optionality results from an interface condition that maps fundamental semantic oppositions onto the morphology in systematic ways, that is according

to a particular hierarchy. The determination of what meanings attach to which morphemes is a compositional matter. Infinitives (which are temporally unanchored in the child's grammar) are good candidates for irrealis meaning. Finite forms are temporally anchored (through a tense chain) and express temporal and/or aspectual meaning, as in the adult grammar. The English bare form, neither modal nor temporal, expresses realis mood, similar to what we find in languages without tense marking. These results provide a challenge to the optionality hypothesis embodied in the various accounts noted earlier – such as underspecification and truncation, and the OT-type theories, since these leave unexplained the semantic differences between finite and non-finite forms.<sup>20</sup>

### Endnotes

\*My deepest appreciation to Kamil Ud Deen, Harold Torrence, Shannon Madsen and Jill Gilkerson for all their help with the analysis of the data presented herein, to all the other members of the UCLA Psycholinguistics lab for their constant support, and to my friends Bonnie Schwartz, Kyle Johnson and Satoshi Tomioka for their help and advice.

<sup>1</sup> The figures for Maarten, Andreas, Philippe and Natalie data are based on Krämer 1993; Hein on Haegeman 1994; Simone on Behrens 1993; Adam and Eve on Sano and Hyams 1994 and Roeper and Rohrbacher 1994.

<sup>2</sup> A further problem for the parametric account of early null subjects is the typological split that we find with respect the RI phenomenon. RIs do not occur (except only very marginally) in the Romance null subject languages (see Sano and Hyams 1994; Hoekstra and Hyams 1996 for discussion), while it occurs very robustly in English and other obligatory subjects languages (cf. table 2). This result is unexpected if all languages start out as null subject languages.

<sup>3</sup> A CHILDES (MacWhinney & Snow 1985) search through the files of Nina (age 1;11-2;4) (Suppes 1971) and Naomi (1;11-2;4) (Sachs 1970) reveals virtually no agreement errors with inflected forms of the verb *be*. The following table shows the frequency of agreement errors:

Table 3a. Error rate in subject-verb agreement with inflected forms of *be*

Child	am	is	Are
Naomi	---	0/90	2/27
Nina	0/14	1/750	2/51

<sup>4</sup> Lasser (1997) argues a similar point.

<sup>5</sup> We argue that the deontic modality inherent in the infinitive is incompatible with stativity (cf. Barbiers 1995) and hence that RIs are restricted to eventive predicates for that reason. The eventivity constraint on RIs is also a property that distinguishes Dutch and other RI languages from English. English bare verbs can be eventive or stative. The lack of an eventivity constraint in English

follows from the lack of modality in the English bare form (see Hoekstra and Hyams 1998) for extensive discussion)

<sup>6</sup> In Wijnen's (1996) study an utterance was taken to be ongoing (present) when the utterance and the eventuality it referred to co-occurred. This was inferred either from contextual information in the transcript or from the response of an adult interlocutor. The utterance was classified as 'past' if context suggested that it referred to a past eventuality, and the utterances was classified as 'future' if it referred to an as yet unrealized eventuality. Wijnen notes that the latter were often expressions of the child's wishes or desires, as in (i), as is also reflected in that fact that an adult interlocutor would recast the utterance using a modal, as in (ii) (examples from Wijnen). In our tables we refer to this category as 'future/modal'.

- (i) NIE: Papa bouwen  
Daddy build-INF  
FAT: geef jij de blokjes maar aan dan  
'well, hand me the building blocks then'
- (ii) NIE: drinke(n)!  
drink-INF  
FAT: wil je die kamer drinken?  
want you in that room drink  
'do you want to have a drink in that room?'

<sup>7</sup> In Hoekstra and Hyams (1998) we propose that the modality of the infinitival morpheme is a universal, hence also true in adult grammar. In fact, RIs in adult grammar, though used in more restrictive circumstances than in child language, also have an irrealis value, as shown in the following example.

- (i) Hier geen fietsen plaatsen!  
here no bicycles place-inf  
'Don't park bicycles here'

When the infinitive is subordinated to a higher clause, its interpretation is obviously linked to that of the higher tense and/or verb. In the example in (ii) the infinitive has a prospective value, that is, the winning is subsequent to the wanting:

- (ii) Jan wilde de prijs winnen 'John wanted to win the prize'

In the complement to a perception verb, as in (iii), the irrealis meaning of the infinitive is cancelled since it is semantically incompatible with the requirement that the event be 'perceptible':

- (iii) Ik zie Jan zijn voeten wassen 'I see John his feet wash-inf.'

Thus, the inherent semantics of a particular form is best seen when the form occurs in isolation, as in RIs.

<sup>8</sup> Behrens (1993) claims that the 5 German children she studied used RIs with both a modal and temporal meaning. However, she does not provide quantitative data for 4 of the 5 children so it is impossible to determine whether they do in fact adhere to the MRE. Behrens does provide a breakdown of Simone's data and they are fully consistent with the MRE -- 70%-85% of Simone's RIs have modal meaning. (cf. also Lasser 1997)

<sup>9</sup> The temporal reference of the verbs was determined by looking at the surrounding context of each verbal utterance as well as contextual notes. Only

sentences with 3rd person singular subjects were counted. We considered both overt subjects and null subjects where the referent was clear from context. Unclear cases were excluded.

<sup>10</sup> The files which are included in the analyses of the English data are Eve: files 1-12 (age 1;6-1;11) and Adam: files 1,8,10,12,14,20,22,24,28,30) (age 2;3-3;5) from the CHILDES data-base (Brown 1973; MacWhinney & Snow 1985).

In this and all subsequent quantitative analyses of English data only sentences with 3<sup>rd</sup> person singular subjects (either overt or inferred from context) are included so that the finite/non-finite status of the sentence is unambiguous.

<sup>11</sup> The following files were examined: Naomi files 47-48 (2;1), 61-62 (2;5) 63--77 (2;5-2;11), 81 (3;2) and 83 (3;3); Nina files 20, 22, 23 (2;4), 27, 28, 30 (2;5), 32 (2;9). (MacWhinney and Snow CHILDES 1985; Suppes 1971; Sachs 1970)

<sup>12</sup> It also follows that English bare verbs are not restricted to eventive predicates, unlike RIs, which are so restricted (see note 4). The eventivity effects also provide evidence that there is a fundamental difference between RIs (which are true morphological infinitives) and the English bare form, which is not an infinitive.

<sup>13</sup> The perfectivity of the English verb is also made clear by the following contrasts:

(i) \* I see John cross the street (cf. I see John crossing the street)

(ii) I saw John cross the street.

(iii) Ik zie Jan de straat oversteken.

I see John the street cross-INF

The ungrammaticality of (i) is due to the incompatibility of the present tense matrix verb with the perfective bare verb *cross*. This contrasts with example (ii) where the event has past reference, compatible with perfectivity. The Dutch example in (iii) is fully grammatical with an ongoing reading since Dutch verbs are not perfective. The contrast between (ii) and (iii) is yet a further illustration of the difference between the English bare verb and true infinitives with regard to their inherent semantics. (see Hoekstra and Hyams 1998 for further discussion.)

<sup>14</sup> We also find finite statives, as in the following examples:

(i) Georgie has jamies on (ii) She wants a drink.

These examples are fully grammatical. Stative verbs can carry present tense marking in adult English.

<sup>15</sup> Languages can also show as aspectual opposition, perfective vs. imperfective, but space limitations prevent me from discussing this issue here. In Hyams (2000), I discuss Russian RIs (which are marked for (im-) perfectivity - cf. Brun, Avrutin and Babyoneshev 1999).

<sup>16</sup> Hoekstra and Hyams (1996,1998) proposed that RIs are possible in early grammar because there is no grammatical anchoring requirement (as in the adult grammar), or more to the point that children have (in addition to grammatical anchoring) a non-grammatical or pragmatic means for anchoring clauses. This proposal is problematic because, as we have seen, RIs are not deictically anchored but rather have a modal interpretation and we would expect that a pragmatic anchor would relate to discourse or context. Moreover, the model we

proposed, like many others, runs up against the fact that the phenomenon is not truly optional.

<sup>17</sup> Temporally anchoring of the present perfective form of the Greek verb to the speech time would be ruled out by the punctuality constraint (cf. 10). In the adult language, the form must be supported by a modal or future particle, and hence there is a modal operator in the structure and not a temporal operator linking the verb to speech time.

<sup>18</sup> Another property of these structures, observed by Varlokosta et al., is that they occur disproportionately more often with null subjects than do the finite sentences with temporal reference illustrated in (22). In this respect they pattern like RIs, which also occur overwhelmingly with null subjects (cf. table 1). We note also that the bare subjunctive structure adheres to the eventivity constraint as do RIs (cf. section 4 and note 4). An analysis of Stephany's (1981) data show that 99% of bare subjunctives (all but 4 of 984 examples) are eventive. See Hoekstra and Hyams 1998 for further discussion of the relation between modality and eventivity.

<sup>19</sup> As noted in Sano and Hyams (1994) the Romance pro-drop languages show a very low rate of RIs (between 3%-16%). The lower frequencies are not directly predicted by the account proposed in this paper. In Hyams (1986) I observed that on average the Italian modals are acquired earlier than the English modals and roughly at the point at which English-speaking children acquire the semi-auxiliaries. It is therefore possible that Italian has an early RI-stage that is supplanted by the earlier acquisition of the modals. Our analysis predicts that the RIs that do occur in Italian and similar languages will have modal reference. Further research is required to test these hypotheses.

<sup>20</sup> The semantic hierarchy proposed here is a conceptual one (by which I mean that a mood distinction is conceptually prior to a tense distinction), but it does raise the question of whether the realis-irrealis opposition is developmentally prior to temporal and or aspectual distinctions. This is possible, but none of the data reviewed in this paper commit us to that position. At the stage of development we are concerned with, children's non-finite clauses co-occur with finite clauses, and the latter seem to encode temporal and/or aspectual distinctions.

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