



ELSEVIER

Lingua 106 (1998) 81–112

Lingua

Aspects of root infinitives[☆]

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Abstract

This paper discusses the phenomenon of root infinitives (RIs) in child language, focussing on a distributional restriction on the verbs that occur in this construction, viz. event-denoting verbs, as well as on a related aspect of interpretation, viz. that RIs receive modal interpretations. The modality of the construction is traced to the infinitival morphology, while the eventivity restriction is derived from the modal meaning. In contrast, the English bare form, which is often taken to instantiate the RI-phenomenon, does not seem to be subject to the eventivity constraint, nor do we find a modal reference effect. This confirms the analysis, which traces these to the infinitival morphology itself, which is absent in English.

The approach not only provides a precise characterization of the distribution of the RI-phenomenon within and across languages; it also explains differences between the English bare form phenomenon and the RI-construction in languages with genuine infinitives by reference to the morphosyntax of the languages involved. The fact that children appear to be sensitive to these distinctions in the target systems at such an early age supports the general thesis of Early Morphosyntactic Convergence, which the authors argue is a pervasive property of the acquisition process.

Keywords: Syntax; Acquisition; Root infinitives; Eventivity; Modality

1. Introduction

The phenomenon of root infinitives (RIs) in child language has received a lot of attention in the recent literature. There has been much debate over the distribution of the phenomenon both within and across languages, and also over the structure underlying RIs. In this paper we focus on the interpretive properties of RIs, an area which has not been very widely investigated. As we will show, there seems to be a con-

[☆] The research for this paper was made possible through a grant from NWO (Dutch Organization for Pure Scientific Research) to Nina Hyams, and a UCLA Faculty Senate Grant. This support is hereby gratefully acknowledged. We thank the audience attending a presentation of this work at the University of Southern California, March 21, 1998, for their comments and questions. We also thank Carson Schütze, Neil Smith and two anonymous *Lingua* readers for their comments.

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straint on the aspectual nature of the verbs occurring in RI-constructions, viz. only eventive verbs are allowed in such constructions, whereas stative predicates occurring during this same period typically require finiteness. We shall refer to this as the Eventivity Constraint (EC). Also, RIs typically do not get a deictic tense interpretation, but rather receive a modal interpretation. We call this Modal Reference Effect (MRE). Interestingly, both the EC and the MRE found in Dutch and other languages appear to be absent from early English bare V-constructions. The fact that English bare V-constructions show neither the effects of the EC nor seem to have modal reference suggests that these two properties are related, one of the points which we will argue in this paper.

More generally, we will address the following questions:

- (i) What is the nature of the Eventivity Constraint?
- (ii) Why do RIs receive modal interpretations and how does this relate to the Eventivity Constraint?
- (iii) Why is English different?

The paper is organized as follows. In Section 2, we introduce the RI-phenomenon, and discuss its main properties as they have emerged from the recent literature. In this section we also discuss several analyses of the RI-phenomenon, focusing on our own underspecification analysis of RIs (Hoekstra and Hyams, 1995, 1997). We show that various syntactic and distributional differences between RIs and English bare V-constructions can be explained as effects of the different morphological systems. This proposal is part of a more general hypothesis concerning the relationship between the child's development of morphosyntax and his development of the interface or discourse conditions governing the expression of the morphosyntax, which we call Early Morphosyntactic Convergence. As we have argued elsewhere (Hoekstra and Hyams, 1995; Hyams, 1997), children readily converge on the specific morphosyntax of the adult target language, but have less restricted interface conditions than adults. In section 3, we present the empirical evidence for the EC and for the claim that RIs receive modal interpretations. In this section we also show how English child language is different in these respects from other child languages that display the RI-phenomenon. In Section 4 we discuss the merits of another theory of RIs, the Null Modal Hypothesis (NMH), which might account for the modal interpretation of RIs. We conclude that although the NMH has a lot of explanatory potential, it meets a number of insurmountable empirical problems. Finally, in Section 5 we directly address the questions in (i) to (iii). We introduce our account of the modality of RI-utterances, and we discuss the relationship between modality and aspect, showing how the EC is in fact an immediate consequence of the modality. Finally, we explain why English is different in these respects from the other languages that have been studied. We explain these interpretive effects in terms of the morphosyntactic properties of the respective adult languages, which also show a (limited) RI-effect. In the conclusion we briefly discuss the interface differences between adults and children that allow children to have a more liberal use of RIs than adults.

2. The Root Infinitive Phenomenon

2.1. Properties of RIs

It has long been noted that children acquiring Dutch, German, Swedish, French and many other languages pass through a stage in which they use infinitives in root contexts – so-called root infinitives (RIs) (term due to Rizzi, 1994), as in (1).

- (1) a. Papa schoenen wassen.
Daddy shoes wash-inf. (Dutch, Weverink, 1989)
- b. Michel dormir.
Michel sleep-inf. (French, Pierce, 1992)
- c. Thorstn das haben.
Thorstn that have-inf. (German, Poeppel and Wexler, 1993)
- d. Jag också hoppa där å där.
I also hop-inf. there and there (Swedish, Santelmann, 1995)

Van Ginneken commented on the existence of RIs in Dutch child language as early as 1917, noting that such utterances had a modal reference. More recent investigation of a number of child languages shows that there are systematic patternings of finite and non-finite clauses in early stages. First, RIs appear in positions in accordance with the target grammar. In French, for instance, finite verbs appear to the left of the negative adverb *pas*, while infinitives appear to its right (Emonds, 1978; Pollock, 1989). Pierce (1992) shows that similarly, in French child language RIs appear to the right of *pas* while finite verb forms appear to its left, as in (2) (cf. also Meisel, 1990; Verrips and Weissenborn, 1992).

- | | |
|---|---|
| (2) [+finite] | [-finite] |
| Elle a <i>pas</i> la bouche.
she has not a mouth | <i>Pas</i> la poupée dormir.
not the doll sleep-inf. |
| Veux <i>pas</i> lolo.
(I) want not water | <i>Pas</i> manger la poupée.
not eat-inf the doll |
| Marche <i>pas</i> .
(she) walks not | <i>Pas</i> casser.
not break-inf. |
| Ça tourne <i>pas</i> .
that turns not | <i>Pas</i> tomber bébé.
not fall baby (Pierce, 1992) |

Note that the finite and non-finite forms in (2) occur during the same time period occurring side by side in the same transcripts, so that RIs cannot be treated as an earlier developmental stage. Table 1 below shows the form-by-position interactions obtained by Pierce.

Similarly, various studies of Dutch and German and other V2 languages have shown that RIs appear in the position of infinitives (clause finally in Dutch and German, after the negative adverb in the Scandinavian languages), while finite forms appear in second position (German: Jordens, 1991; Meisel, 1990; Boser et al., 1992,

Table 1
Finiteness and position of negation in French (Philippe) (Pierce, 1992)

	Finite verb	Non-finite verb
Neg V	11	77
V neg	185	2

Weissenborn, 1991; Poeppel & Wexler, 1993; Clahsen and Penke, 1992; Dutch: de Haan, 1986; Jordens, 1991. Swedish and Danish: Plunkett and Strömquist, 1990). Data from the German child Andreas, presented in Table 2, is illustrative of this general finding.

Table 2
Finiteness and position of verb in Andreas (Poeppel and Wexler, 1993)

	Finite verb	Non-finite verb
V2-position	197	6
Final position	11	37

Andreas corpus: Wagner, 1985; CHILDES, MacWhinney and Snow, 1985.

As discussed in Hoekstra et al. (1996), the RI-phenomenon is not due to a lack of knowledge of the relevant finite morphology nor to a lack of knowledge of Spec-head agreement requirements. When finite forms are used, agreement is almost always correct. Table 3 provides the frequencies of agreement errors occurring in finite utterances in several child languages. The number of such errors is under 4%, very low even by the most stringent acquisition standards.

Table 3
Percentage of subject-verb agreement errors in early language

Child	Language	Age	<i>n</i>	%Error	Source
Simone	German	1;7–2;8	1732	1%	Clahsen and Penke, 1992
Martina*	Italian	1;8–2;7	478	1.6%	Guasti, 1994
Diana*	Italian	1;10–2;6	610	1.5%	Guasti, 1994
Guglielmo*	Italian	2;2–2;7	201	3.3%	Guasti, 1994
Claudia	Italian	1;4–2;4	1410	3%	Pizzuto and Caselli, 1992
Francesco	Italian	1;5–2;10	1264	2%	Pizzuto and Caselli, 1992
Marco	Italian	1;5–3;0	415	4%	Pizzuto and Caselli, 1992
Marti*	Cat/Spain	1;9–2;5	178	0.56%	Torrens, 1992
Josep*	Cat/Spain	1;9–2;6	136	3%	Torrens, 1992
Gisela*	Catalan	1;10–2;6	81	1.2%	Torrens, 1992
Guillem*	Catalan	1;9–2;6	129	2.3%	Torrens, 1992

(*Data available on CHILDES, MacWhinney and Snow, 1985; Martin, Guglielmo, Diana corpora, Cipriani et al., 1991; Marti, Josep, Guillem, Gisela corpora: Serra and Solé, 1992)

Furthermore, RIs bear correct infinitival morphology, e.g. *-en* in Dutch and German; *-er/ir* in French, *-a* in Swedish and so on.

The data just reviewed leads to the conclusion that RIs constitute a grammatical category in their own right in a number of child grammars, with properties that differentiate it from finite constructions. This conclusion will be further reinforced by evidence we discuss below concerning other distributional and semantic differences between RIs and finite verbs.

Let us now turn to English. Wexler (1994) has argued that English speaking children also show an RI-stage. Utterances of the sort in (3), where the verb is missing the 3rd person singular *-s*, are analyzed by Wexler as the English analogue of the RI.

- (3) a. Eve sit floor. (CHILDES, Brown, 1973)
 b. Cowboy Jesus wear boots.

The evidence for Wexler's conjecture is obviously much less strong than the evidence from other languages. First, English lacks a clear infinitival ending. Moreover, in English there is no positional difference between finite and non-finite verb forms.¹ However, by assuming that it instantiates the RI-phenomenon, the lack of *-s* inflection in English finds an independently motivated explanation and it brings English in line with the other languages studied. An alternative for English might be to analyze utterances such as those in (3) as resulting either from a breakdown in agreement or from the dropping of the *-s* affix due to production problems. But neither of these suggestions is theoretically very compelling. Why would English children make agreement errors or drop finite morphology when children acquiring other languages do not? In fact, with regard to agreement, Harris and Wexler (1996) show that to the extent that this can be tested given the weak inflectional system of English, young English speaking children do not make agreement errors. Of 1352 sentences containing the first person subject *I* from the corpora of several English speaking children, only 0.02% occur with a verb bearing *-s* (e.g. *I goes*). Many more such errors would be expected if these children simply failed to respect Spec-head agreement requirements. On the other hand, an account in terms of affix dropping would not explain the distribution of negation in early English utterances. Harris and Wexler show that bare negatives in early English, that is, negative adverbs unsupported by an auxiliary, only occur with uninflected verbs as in (4a) and never with inflected forms as in (4b). (@ indicates that the form or utterance is unattested in the acquisition data.) As Harris and Wexler note, this asymmetry is unexpected if the bare form results simply from the dropping of finite morphology.²

- (4) a. Mommy not go.
 b. @Mommy not goes.

¹ An exception are the verbs *have* and *be*, but as we will see later, auxiliary verbs never occur as RIs.

² Children use both *doesn't* and *don't* with third person singular subjects in negative utterances, where the latter type of utterance could be considered an agreement error. We assume that *do* is inserted here to support *n't*. It is interesting to note that when inverted, auxiliary *do* is always correctly inflected.

Despite the theoretical appeal of Wexler's conjecture, we will show that it is too general. As we will see, there are both quantitative and qualitative differences in the behavior of the English bare form and the root infinitive in the other languages studied. We will further show that these differences stem precisely from the morphosyntactic difference between true infinitives and the English bare form, which is not in fact an infinitive.

2.2. *The grammatical representation of finiteness and RIs*

Now that we have concluded that RIs constitute a construction type in its own right, different from finite constructions, we turn to the question of their grammatical representation. Various approaches are available in the literature. One such approach, championed by Radford (1990) and others, holds that the RI-phenomenon results from the absence of functional categories. The idea is that functional categories are subject to maturation, and that early grammars consist solely of lexical projections (cf. also Lebeaux, 1988). Since the Infl-projection, or whatever inflectional projections comprise the label Infl, is a functional category, the absence of *-s* in the examples in (3) is an automatic consequence of this maturational theory. It should be noted that this explanation is strongly inspired by the bare form phenomenon in English, the only language considered by Radford and most other proponents of this theory. The presence of an infinitival marker in the RI-utterances in (1) is less evidently in congruence with the idea that early grammars have only lexical projections. Moreover, the fact that the RI-construction occurs alongside finite clauses and shows different properties argues strongly against this maturational account.

Another approach is Rizzi's (1994) theory of truncation, according to which RIs result from truncating part of the top structure of full clauses. On this approach the child's grammar has in principle the full clausal structure available. The Full Clause Hypothesis also underlies various analyses which postulate the underspecification of particular functional categories in the top structure of the clause. This has been the tack that we have taken (cf. Hoekstra and Hyams, 1995, 1996, 1997). Our underspecification analysis, the details of which we outline below, is part of a more general theory of the relationship between two aspects of language, the morphosyntax and the interface (or discourse) conditions which govern the expression of morphosyntax. We propose that children converge on the morphosyntax of their ambient language very quickly, as is evidenced by the kind of properties we reviewed above concerning agreement and form-position correlations, but that children are less restricted than adults in the grammatical options allowed by the relationship between grammar and discourse. In particular, we take the position that finite and non-finite constructions are grammatical in the adult system as in the child's system, but that the RI-construction is much more limited in the adult output because of a bleeding relationship that exists between RIs and finite utterances. We shall return to this difference between adult and child systems in Section 5. Let us now briefly sketch the representational system that we envision.

Our basic assumption with respect to finite clauses is that they are grammatically *anchored*. By this we mean that the temporal location of the eventuality denoted by

the VP is fixed through a temporal operator, which we assume is located in C, following Enç (1987) and Guéron and Hoekstra (1989). The notion of finiteness refers to this fixation, as finiteness makes visible a chain between the operator and the verb, or, more specifically, the Tense position. Tense itself is taken to be a pronominal, which receives the status of pronominal variable if it is connected to a tense operator (TO) through a visible tense-chain. This is depicted in (5):

(5) TO_i F₁ ... F_n ... Tense_i VP

Languages vary with respect to the morphological extensions that are used to make the tense-chain visible. This is to say that the notion of finiteness is expressed in different ways in different languages. Some languages give overt manifestation of finiteness in terms of a tense-morpheme, for example, Japanese. Others express finiteness with person morphology, and yet others through number morphology. So, in Dutch, a present tense finite verb is morphologically marked for singular or plural, but not for either person or tense. It is therefore number morphology in Dutch that makes a tense-chain visible in the case of present tense.³ A language such as Japanese makes a tense-chain visible through the morphological expression of tense, and languages such as Italian, Spanish and Catalan make the chain visible through the expression of (at least) person morphology.

We furthermore observe that not all child languages allow RIs. The empirical generalization in this respect is that RIs occur only in languages where the expression of finiteness may be done exclusively through number morphology. Languages where finiteness is always expressed with person agreement, or with tense-morphemes appear not to allow RIs. This can be seen in Table 4. In this table we divide the languages in non-RI languages, where the phenomenon occurs sporadically at best, and RI-languages, where it occurs with much higher frequencies (with some amount of variation depending on the child and on the language).

It is worth noting that English has the highest frequency of non-finite forms, ranging from 75% to 81%. We will return to this point below (in Section 4) when we discuss the differences between English and the other RI-languages.

In order to capture this empirical generalization, Hoekstra and Hyams (1995) propose that the RI-phenomenon results from the optional underspecification of the functional head Number. If Number is unspecified in languages where only number morphology expresses finiteness, e.g. Dutch, no tense-chain is made visible and the verb is non-finite. In this instance, Tense is not bound as a pronominal variable by a tense operator, but rather has the status of a free pronoun, which gets its interpretation discursively. In that case, the structure is unanchored. In person-marking and

³ We take the -t suffix to be an extension of singular number. Its absence in first person follows from the assumption that first person is unmarked (cf. Kayne, 1989). We similarly follow Kayne in assuming that English -s expresses singular number, the absence of -s in first person following from the same assumption, and its absence in the case of *you* following from the assumption that *you* is grammatically plural, like French *vous*. The inclusion of German and French among the RI-languages may be surprising in view of the fact that these languages apparently have person marking morphology. See Hoekstra and Hyams (1995) for motivation and discussion of this point.

Table 4

Frequencies of root infinitives in child language (partially based on Sano and Hyams, 1994)

<i>Non-RI languages</i>	Child	Age	%RIs	<i>RI languages</i>	Child	Age	%RIs
Italian (Guasti, 1994)	Diana	2;0	0.00	French (Pierce, 1992)	Nathalie	1;9–2;3	0.49
	Martina	1;11	0.16		Philippe	1;9–2;6	0.20
		2;1	0.04		Daniel	1;8–1;11	0.43
Italian (Schaeffer, 1990)	Paola	2;0–2;5	0.07	Swedish (Platzack)	Freja	1;11–2;0	0.38
	Daniele	1;7–2;6	0.08	(from Guasti, 1994)	Tor	1;11–2;2	0.56
	Massimo	1;7–2;6	0.06	German (Weissenborn)	Embla	1;8–1;10	0.61
	Gabriele	1;7–2;6	0.07		S	2;1	0.46
	Orietta	1;7–2;6	0.05	(from Guasti, 1994)		2;2	0.40
	Elisabeta	1;7–2;5	0.10	Dutch (Weverink, 1989)	Laura	1;8–2;1	0.36
	Francesco	1;9–2;5	0.05		Tobias	1;10–1;11	0.36
Spanish (Grinstead, 1994)	Damariz	2;6–2;8	0.05		Fedra	1;10–2;1	0.26
	Juan	1;7–2;0	0.12	(Haegeman, 1994)	Hein	2;4–3;1	0.16
		2;1–2;4	0.10	Icelandic (Sigurjónsdóttir p.c.)	Birna	2;0–2;3	0.36
Catalan (Torrens, 1992)	Guillem	1;11–2;6	0.03	English	Eve	1;6–1;10	0.78
	Marti	2;0–2;5	0.03		Adam	2;3–3;0	0.81
Japanese (Sano, 1995)	Toshi	2;3–2;8	0.02		Nina	2;4–2;5	0.75
	Ken	2;8–2;10	0.08				
	Masanori	2;4	0.10				

tense-marking languages the verb will always bear the relevant finite morphology since these heads may not be left unspecified (by hypothesis) and hence RIs do not occur. Alternative underspecification accounts, which postulate that tense itself may be optionally unspecified in early grammar (Wexler, 1994) or that agreement is absent altogether (Clahsen et al., 1994) do not explain the lack of RIs precisely in those languages which exclusively mark tense, such as Japanese, and the Romance person-marking languages.

The question arises as to why number should have a privileged status, i.e. why should number, but not person or tense, have the option of remaining unspecified in the early grammar. It is quite understandable that tense does not have this status, if we are right in claiming that the RI-phenomenon basically derives from Spec-Head agreement (cf. Hoekstra et al., 1996a, and Section 4 below), and hence is based on a specification in DP. But the question remains as far as the distinction between number and person is concerned. It would take us too far afield to go into this question in any depth, but the difference in behavior in this respect is no doubt related to a more fundamental difference between the role of number and person in the grammar. Number is a nominal feature, classifying nominal structures in a paradigmatic opposition. Its grammatical status is also evident from the fact that it is normally involved in various agreement relationships (noun-adjective agreement, for example). Person, in contrast, is not a nominal feature in the same sense: it does not classify nominal expressions along some dimension, nor is it generally found in agreement relationships. Rather, person is deictic, allowing reference to participants in the speech situation, and its occurrence in the grammar is often limited to agreement when tense, similarly a deictic category, is also involved. Thus,

if underspecification in the verbal domain (i.e. RIs) is a reflex of underspecification in the nominal domain and if number, but not tense or person, is a nominal feature, then we see why underspecification is restricted to number. How the underspecification of number in child language relates to the deeper differences between number and person noted above is a question which requires further investigation.

Having provided a brief overview of the RI-phenomenon, we now turn to the main topic of this paper, viz. certain distributional and interpretative properties of RIs that have hitherto received far less attention.

3. The Eventivity Constraint and the Modal Reference Effect

As discussed above, the observation that children use non-finite verbs has led to the investigation of distributional and other syntactic properties associated with different verb forms. A second line of research, dating back to the early 70s, is more interested in the interpretive correlates of the different inflections that children use in the early stages of language development. The basic observation is that different inflections distribute selectively over different aspectual classes of verbs. The most influential version of this ‘aspect-before-tense’ hypothesis is Antinucci and Miller (1976), who argue that Italian (and English) children use participles not to denote preterites, but rather resulting states, and hence, that their distribution is limited to accomplishment verbs (cf. also Shirai and Anderson, 1995; Bronckart and Sinclair, 1973; Bloom et al., 1980).

The link between inflection and aspectual class raises the question as to whether there are particular aspectual properties associated with RIs. Relevant to this question is the finding of De Haan (1986), based on early Dutch, that auxiliary verbs do not occur as RIs (see also Sano and Hyams, 1994). According to De Haan, elements of the AUX category, which expresses time and modality, always occur in finite form and in second position, while elements of the category V, which express notions such as act and change, occur in non-finite form in final position. Jordens (1991) notes, however, that the finiteness restriction is not limited to auxiliaries, but applies more generally to statives. Jordens (1423) describes the distribution of inflections across aspectual classes of verbs in early Dutch as in (6):

(6) <i>finite</i>	<i>infinitives</i>	<i>participles</i>
statives	activities	resultatives
resultatives		activities

Although we disagree with Jordens’ characterization of activities and resultatives, that is not pertinent to the present discussion. We will focus instead on the point that is important for our purposes, which is the observation that stative verbs are exclusively finite, or, put differently, that RIs do not allow stative predicates, but rather, require event-denoting predicates. We formulate this as the Eventivity Constraint (EC), as in (7):

(7) *The Eventivity Constraint (EC)*

RIs are restricted to event-denoting predicates

The non-occurrence of auxiliary verbs as RIs noted by De Haan is subsumed under the EC.

Ferdinand (1996) observes that there is an eventivity constraint in early French as well. During the RI stage in French, stative verbs are exclusively finite, while event-denoting verbs occur both in finite and non-finite forms. In (8) we list the set of stative verbs which Ferdinand finds during this stage. These verbs occur in finite form only.

(8) *Stative verbs in early French: Finite only*

avoir(have), être (be), s'appeler (be called), manquer (be absent, lack), vouloir (want), croire (believe), plaire (please), aimer (love), adorer (adore), espérer (hope), savoir (know), se souvenir (remember), devoir (must), falloir (be necessary), pouvoir (can), aspectual aller (go)

A particularly good example of the EC at work is Ferdinand's observation that the verb *aller* (go) does occur as an RI, but only in its main verb use. In its use as an inchoative auxiliary it is always finite. Thus, we find *Mama aller* ('Mommy go-inf') and *Mama vaît manger* ('Mommy is going to eat') but not **Mama aller manger* ('Mama go-inf eat-inf').

Wijnen (1996) provides relevant quantitative data from four Dutch children.⁴ Out of 1883 RIs in their corpora, 1790/1883 or 95% are eventive verbs, and only 93/1883 or 5% are stative verbs. In fact, the number of real stative verbs may be even more limited. The most frequently found 'stative verbs' are *hebben* (have), *zien* (see) and *horen* (hear). But the latter two verbs, while not controllable, are certainly not stative. *Hebben*, on the other hand, denotes a state, but the interpretation of *hebben* in at least some of these RI-contexts is 'get' rather than 'have', as is also a possible interpretation of *hebben* in adult Dutch (cf. *Ik heb een fiets gehad voor mijn verjaardag* (I have had (=got) a bicycle for my birthday)), and of *have* in English (cf. *Mary had a baby last night*). Thus, the figures given by Wijnen may actually overestimate the number of stative RIs, which is already strikingly low as compared to eventive RIs. We conclude, therefore, that stative verbs (at least with stative, i.e. non-inchoative interpretation) hardly ever occur in RIs. In contrast to the RI situation, Wijnen finds that the finite verbs are evenly split between eventive and stative verbs, as shown in Table 5.

⁴ The ages of the children in Wijnen's study are as follows:

Josse	2;0.7-2;6.22
Matthijs	1;11.10-2;8.5
Niek	2;7-3;2.13
Peter	1;9.6-2;1.26

Josse and Matthijs' data were collected by Gerard Bol and Evelien Krikhaar; Niek's data were collected by Frank Wijnen. These corpora are available through CHILDES (MacWhinney and Snow, 1985).

Table 5

Inflection of eventive and non-eventive verbs in four Dutch children (based on Wijnen, 1996)

	Finite	RIs
Eventive	350	1790
Non-eventive	349	93
Total	699	1883

In Russian, there is a similar eventivity constraint on RIs. While the number of RIs in early Russian is relatively small, Van Gelderen and Van der Meulen (1998) find that 98% of Varya's (CHILDES, MacWhinney and Snow, 1985; data collected by E. Protassova) RIs are eventive. We see, then, that in several typologically distinct child languages, RIs are subject to the EC.

A further interesting property of RIs is that their reference is not free. As noted previously, it is an old observation that RIs typically have a modal interpretation (Van Ginneken, 1917). More recently, Hoekstra and Jordens (1994) argue for the modality of Dutch RIs on the basis of patterns of negation. The child they studied uses two negative forms, the adult negative adverb *niet* with finite verbs, and the adult anaphoric negative adverb *nee* in combination with RIs. This *nee* stands in opposition to combinations of modal verbs plus *niet*, such as *kan-niet* (cannot) and *mag-niet* (may not). *Nee* is replaced later by *moet-niet* (must-not). Contextual analysis of *nee* with RIs confirms this modal negative meaning. Plunkett and Strömquist (1990) make the same observation concerning the modality of RIs for Swedish, Ingram and Thompson (1996) for German, and Meisel (1990) and Ferdinand (1996) for French. Wijnen (1996) provides the quantitative data in Table 6 on the reference of Dutch RIs.

Table 6

Temporal reference of RIs and finite verbs in four Dutch children (Wijnen, 1996)

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

These data show that while finite verbs have mostly present tense interpretations, the modal reference is the most frequent one for RIs. Let us formulate this finding as in (9):

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

With overwhelming frequency, RIs have modal interpretations

Given that the modal itself is not overtly expressed, we can only state the kinds of modal messages that these RIs seem to convey. These include deontic and boulemaic

modality, expressing necessities and desires. The meaning of the RI sentences is inferred from the linguistic and non-linguistic context of the utterance.⁵ Some examples follow.

- (10) 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 also build a boat’.
- d. Jij helicopter maken.
 You-NOM helicopter make-INF
 ‘You must build a helicopter’.

Let us now turn to English again. Here the situation is very different: neither the EC nor the MRE seem relevant to the English bare form phenomenon. Let us first consider eventivity. Ud Deen (1997) checked the distribution of finiteness across eventive and non-eventive verbs in the files of Adam and Eve (Brown, 1973). The verbs which Ud Deen counted as stative were *know*, *need*, and *want*. Only third person subject sentences were counted so that the finite/non-finite status of the verb was clear. Repetitions and imperative sentences were excluded. Ud Deen found numerous examples of bare stative verbs such as those in (11).

- (11) a. Man have it.
 b. Ann need Mommy napkin.
 c. Papa want apple.

⁵ In Wijnen’s (1996) study an utterance was taken to be on-going (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 these were often expressions of the child’s wishes or desires, as in (i), as is also reflected in the 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?’

Table 7 reports the quantitative results of Ud Deen's analysis.⁶

Table 7

Finiteness of eventive and non-eventive verbs in English (Adam and Eve) (based on Ud Deen, 1997)

	Finite	Bare verb
Eventive	81	199
Non-eventive	8	65
Total	89	264

We see first that the English bare form is not at all limited to eventives, in contrast to Dutch RIs; approximately 25% (65/264) of the bare verbs are non-eventive, while only 5% of the Dutch RIs are (cf. Table 5). The difference between English and Dutch is even more striking when we look at the breakdown of the non-eventives. The English non-eventives occur most often in the bare verb form. Of the 73 tokens of non-eventive verbs, 65 (89%) are bare forms and only 8 are finite. This is again in marked contrast to the situation in Dutch where non-eventive predicates are typically finite, 349 of 442 (79%) are finite. And recall that the 93 non-eventive RIs in Dutch is inflated due to the inclusion of verbs such as *hear* and *see* which are not really stative. Thus in English non-eventive verbs most often occur in non-finite form. Clearly the EC is not operating on English bare forms.

Ud Deen (1997) also looked at the reference of the bare forms, and again, as shown in Table 8, we see that in contrast to Dutch, modal reference is not the dominant one. Rather, the bare forms have mostly a deictic temporal interpretation (present or past), with the present tense here-and-now interpretation being the most frequent. Only 13% of the English bare forms have a modal interpretation (34/264 collapsing across eventive and non-eventives). This is in contrast to Dutch, where 86% of RIs have a modal reading.

Table 8

Temporal reference of bare forms in English (Adam and Eve) (based on Ud Deen, 1997)

	Past	Present	Future/modal	Total
Eventive	56 (28%)	109 (55%)	34 (17%)	199
Non-eventive	3 (4%)	62 (96%)	0	65
Total	59	171	34	264

In fact, there is little difference between the reference of bare forms and finite forms, as can be seen by comparing Table 8 with Table 9.

⁶ The files which are included in this analysis 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 and Snow, 1985).

Table 9

Temporal reference of finite forms in English (Adam and Eve) (based on Ud Deen, 1997)

	Past	Present	Future/modal	Total
Eventive	33 (40%)	38(47%)	10 (12%)	81
Non-eventive	0	8 (100%)	0	8
Total	33	46	10	89

As might be expected, the predominant reference for finite verbs is temporal. Only 10% of the verbs in Table 9 have a modal reading (10/89 collapsing across eventive and non-eventive), which is very close to the 13% modal reading that we find for bare forms. Again the contrast with Dutch is noteworthy; in Dutch, 86% of RIs have a modal interpretation, while only 3% of the finite verbs do (cf. Table 6).

On the basis of this evidence we conclude that the bare form in English is not subject to either the EC or to the MR. The fact that English is different in both respects from the other languages studied, suggests that the EC and the MR are related. Having laid down the empirical groundwork, let us then return to the questions formulated in the introduction: first, why are RIs in Dutch and other languages restricted to eventive verbs (the EC); second, how does this relate to the future/modal interpretation (MR); and third, why is English different in these respect? In the section that follows we present one possible answer to these questions, the Null Modal Hypothesis (NMH). We will show, however, that despite its explanatory potential, the NMH does not provide an adequate account of various properties of RI-constructions, nor does it provide a basis for explaining the crosslinguistic differences associated with RIs.

4. The Null Modal Hypothesis

A possible explanation for the EC and MR takes the form of a two-part hypothesis, as in (12):

- (12) (i) The structure of RI-utterances contains a non-overt modal verb, and
(ii) Modal verbs select eventive predicates.

Let us refer to this as the Null Modal Hypothesis. Various suggestions leading to such a hypothesis can be found in the literature. Plunkett and Strömquist (1990: 48) suggest that negative RIs (e.g. *inte Mamma tvätta* 'NEG Mummy wash-inf') have a missing modal verb, in order to account for the observed word order with preverbal negation. Boser et al. (1992) adopt a version of the Continuity Hypothesis, according to which children's apparently non-finite utterances are structurally identical to finite adult utterances. They account for sentences which lack a finite verb in German by postulating a null auxiliary in the underlying structure. The null auxiliary moves to C, which blocks the raising of the infinitive, thereby explaining the fact that German RIs occur in sentence-final position. Krämer (1993) also postulates a

null modal for RIs in order to account for the Case marking of lexical subjects which sometimes occur with RIs. Ferdinand (1996) goes one step further. She suggests not only that RIs have a null modal, but also that modals select eventive predicates.

The NMH has a large explanatory potential. First, it explains the presence of infinitives in root contexts; the lack of a finite verb is only apparent as there is a phonologically null finite modal verb and it is this modal verb that selects the infinitival form. The fact that the RI occurs in the position where an infinitive normally occurs in the adult language is also accounted for, as noted above; it is the null modal that undergoes V-to-I (to C) and hence the main verb cannot raise. The surface syntax of such utterances is therefore accounted for. The NMH also explains the modal reading of RIs, which is established through the meaning of the null modal itself. Finally, to the extent that a connection can be established between modal verbs and the aspectual nature of their complements, the EC might follow from it as well. We return to point this below.

However, despite its considerable appeal, the NMH runs into a number of theoretical and empirical problems, some of which are noted in the literature. The gist of some of the problems is that the NMH obliterates the morphosyntactic distinction between finite utterances and RIs. As a result, it is unable to capture those properties that are dependent on finiteness, and which are missing in RIs. One such case concerns topicalization in V2 languages. As Poeppel and Wexler (1993) point out, the NMH has no proper account for the asymmetry in topicalization in finite and non-finite clauses (this observation is attributed to David Pesetsky). Under the standard theory of topicalization in (adult) V2 languages (Den Besten, 1983), topicalization targets the CP, which itself requires a finite verb to move into its head-position, yielding the structure in (13b) for a topicalization construction like (13a):

- (13) a. Aan Marie wil ik een boek geven. (Dutch)
 To Mary want I a book give-INF
 ‘To Mary I want to give a book’
 b. [_{CP} aan Marie]_j [_{C'} wil]_i [_{IP} ik een boek t_j geven t_i]]

As has been observed by a number of people, including Boser et al., children acquiring V2 languages adhere to the adult restrictions; they topicalize in finite sentences, but not in RIs. Table 10 summarizes the data from three V2 languages, German, Dutch and Swedish. It shows that non-subject initial RIs are virtually absent, that is, RIs with objects or adverbs as topics do not occur, while topicalization of non-subjects in finite clauses is a robust phenomenon.⁷

Under the view that RIs are genuinely infinitival structures, as we argue, this asymmetry is easily accounted for. According to the NMH, on the other hand, RIs are covert finite clauses and hence should pattern like overt finite clauses.

⁷ Under the standard analysis of V2, subject initial main clauses also arise through topicalization (movement of the subject from Spec,IP to Spec,CP). However, subject initial clauses are also amenable to a non-movement analysis (cf. Travis, 1984; Zwart, 1994). Only when a non-subject (object or adverb) occurs in clause-initial position, are we certain that topicalization has occurred.

Table 10
Number of subject initial and non-subject initial RIs and finite clauses

	Subject initial		Non-subject initial		
	Finite	RI	Finite	RI	
German	130	24	50	0	Poeppe and Wexler, 1993
Dutch	1223	101	1346	5	Haegeman, 1994
Swedish	145	147	61	1	Platzack, 1992

Boser et al. (1992) are aware of this problem and suggest the following solution. Because the auxiliary in C is a null category, it must be licensed by an overt specifier with the same agreement features. This condition is satisfied only when the subject occupies the specifier of CP position since in this case the features of the null auxiliary are recoverable from its specifier. If an object or adverb occupies the Spec,CP position, the null auxiliary is not properly licensed or identified because it does not share agreement features with the null modal. This then explains why in the presence of a null auxiliary (i.e. in RIs) the subject has to be in clause initial position. Apart from the question of how other features of the modal verb are recoverable (e.g. its modal value), the Boser et al. version of the NMH requires that the null auxiliary be licensed by an *overt* subject in its specifier. Hence, the analysis predicts that RIs should only occur with overt subjects. But in fact, as shown in Table 11, in various languages that have been studied the vast majority of RI-subjects are null. Particularly relevant to the present discussion are the V2 languages, German, Flemish and Dutch, which Boser et al. specifically analyze as null modal languages. Note that English does not follow the pattern. English bare forms most often occur with overt subjects and do not distinguish themselves from finite forms in this regard. We return to the idiosyncratic behavior of English below.

The asymmetrical behavior of finite clauses and RIs with respect to topicalization is mimicked in WH-constructions. As WH-movement targets the specifier of CP and induces V-movement to C, it is expected that it will only occur in constructions with finite verbs.⁸ This prediction is correct. As Table 12 shows, in Dutch, German, Swedish and French, WH-questions are virtually absent in non-finite utterances, though these languages clearly have non-WH RIs, as shown by the percentages of [-finite] verbs in the 'all clauses' column.⁹

⁸ This expectation is based on the generalization that V-movement to C is restricted to finite verbs. It is not immediately evident whether this restriction is related to WH-movement (or V-movement to C), or whether it is a corollary of the requirement on adult grammar that independent clauses be finite. In Hoekstra and Hyams (1997), we in fact argue that child English has non-finite I-to-C movement, and hence that the finiteness requirement on V-to-C movement in the adult grammar is indeed a consequence of the independent requirement on adults that root clauses be finite.

⁹ The data in Table 12 is based on the following sources: Dutch: Hein 2;4–3;1 (Haegeman, 1994); German: various children (Kursawe, 1994); Swedish: various children (Santelmann, 1994); French: Philippe 2;1–2;3 (Crisma, 1992); English: Adam 2;3–3;1 (Phillips, 1995).

Table 11
Percentage of null and overt subjects in finite and non-finite clauses

Lang	Child	Finite verbs			Non-finite verbs			Source
		Overt	Null	Total	Overt	Null	Total	
Flemish	Maarten 1;11	75%	25%	92	11%	89%	100	Krämer
German	Simone 1;8–4;1	80%	20%	3636	11%	89%	2477	Behrens, 1993
German	Andreas	92%	8%	220	32%	68%	68	Krämer, 1993
French*	Nathalie 1;9–2;3	70%	30%	299	27%	73%	180	Krämer, 1993
French*	Philippe 2;1–2;6	74%	26%	705	7%	93%	164	Krämer, 1993
Dutch	Hein 2;3–3;1	68%	32%	3768	15%	85%	721	Haegeman, 1994
English	Eve 1;6–2;3	90%	10%	86	89%	11%	155	Phillips, 1995
English	Adam 2;3–3;0	69%	31%	113	80%	20%	242	Phillips, 1995

* for French, only preverbal subjects were counted

The WH-facts bring to light a further difficulty of the NMH as formulated by Boser et al. (1992). Under their proposal, it is expected that non-subject WH-RIs will not occur since the null modal would not be licensed in this case, but that subject WH-RI questions should freely occur. This prediction is not borne out. As just noted, in Dutch, German, Swedish and French, non-finite WH-questions are virtually absent and hence we do not find the subject-non-subject asymmetry expected on the Boser et al. account.¹⁰

Table 12
Percentage of RIs in finite and non-finite WH-questions and in all clauses

	All Clauses		WH-questions	
	+Finite	-Finite	+Finite	-Finite
Dutch	3768 (86%)	721 (16%)	88 (97%)	2 (3%)
German	–	–	306 (99.6%)	1 (0.4%)
Swedish	–	–	675 (99.6%)	5 (0.4%)
French	921 (83%)	195 (17%)	114 (100%)	0 (0%)
English	134 (40%)	203 (60%)	69 (43%)	92 (57%)

¹⁰ Given that there is in fact no difference between subject and non-subject questions, Barry Schein (p.c.) suggests that the relevant generalization might be that a null auxiliary may not occur in C. Such a suggestion is consistent with the distribution of *ha* (have) deletion in adult Swedish, which, according to Holmberg (1986), can occur only in embedded clauses, where the empty *ha* would be governed by the complementizer. This hypothesis would indeed capture the non-occurrence of WH-RIs, but it is unable to explain the actual occurrence of RIs in general, as these always involve a null modal in C. One might adopt the non-unitary analysis of V2 (cf. Travis, 1984; Zwart, 1994), according to which only non-subject initial main clauses involve V-movement to C, while the verb moves no further than I in subject initial main clauses. The absence of non-subject initial RIs then follows from Schein's suggestion, assuming now that null modals are allowed in I, but not in C. However, this would make child grammar different from adult Swedish, in which *ha*-deletion is also excluded in subject initial main clauses, which supports a unitary V-to-C analysis for adult V2 languages.

Table 12 shows that English differs from the other languages in allowing non-finite WH-questions, e.g. ‘Where Teddy sleep?’ Neither does English show the asymmetry with respect to subject and non-subject questions; infinitival WH-questions include both subject and non-subject questions (cf. Guasti and Rizzi, 1996; Roeper and Rohrbacher, 1994). The NMH has no basis for explaining the crosslinguistic difference, as it is unclear why English would allow null modals in WH-questions, while the other languages do not.

For the same reason, the NMH also fails to provide a basis for explaining the fact that certain languages exhibit an RI-stage and others do not. Recall from Section 2.2. that RIs are not found in all child languages. Rather, whether a language shows an RI-stage or not is dependent on the inflectional properties of the adult language – languages which mark number exclusively show an RI-stage, while tense and person-marking languages do not (Hoekstra and Hyams, 1995). It is not easy to see how the NMH could account for this generalization. Why would the former languages allow null modals, and the latter not?

A final point for which the NMH provides no understanding concerns the range of subject types found in RI-constructions. As the NMH analyzes RIs basically as finite clauses with a null finite verb, the only expectation we may have is that RIs only occur with overt subjects, since these are required to license the null modal. However, as we already showed in Table 11, this expectation is not at all borne out. Rather, with the exception of English, RIs occur predominantly with null subjects.¹¹ This null-subject-RI correlation is expected on our underspecification approach, as we will now explain. The following discussion is based on Hoekstra and Hyams (1995), Hoekstra et al. (1996) and Hoekstra and Hyams (1997). Given that Number is an inflectional ingredient in both the nominal and the verbal system, the underspecification of Number hypothesis leads us to expect cross-categorical effects as well as correlations between the finiteness specification in the clause and in its subject. More precisely, we argue that the optionality of determiners (e.g. *doggie bark*) observed in child languages, as well as the occurrence of certain types of null subjects, result from the underspecification of Number in the nominal domain. On our

¹¹ It is important to be clear about the nature of the null subjects. We assume that the subject of non-finite clauses, including RIs, is a radically underspecified null element, essentially PRO. On the other hand, there is the *pro* subject of the Romance pro-drop languages, which we take to be a fully specified pronominal minus a phonological matrix. This is the element that appears in subject position in finite clauses in Romance child and adult languages. A question arises as to the identity of the null subject in finite clauses in non-pro-drop languages. Although finite clauses generally occur with lexical subjects, there is still a percentage of null subjects (cf. Table 11). It seems clear that in the V2 languages what is involved is a null topic, as first argued by De Haan and Tuijman (1988), an option also available in the adult languages, but in a more restricted way, cf. Dutch *Die film heb ik al gezien* ‘That movie have I already seen’ with an optionally null object topic, and *Dat mag niet* ‘That may not = that is not allowed’ with an optional null subject topic. The evidence for a null topic analysis is that these null subjects almost always occur in first position (Spec,CP), and not in post-verbal position (Spec,IP) (cf. Poeppel and Wexler, 1993; Haegeman, 1995). Null subjects also occur with finite verbs in English, which is not a V2 language. Nevertheless, there is evidence to suggest that these null elements also arise from topic or diary drop. Roeper and Rohrbacher (1994) show that null subjects in finite contexts drop significantly in WH-contexts, where the WH-phrase occupies the Spec-CP position.

analysis the specification of functional heads within DP, through definite determiners, pronouns, or plural marking, results in ‘finite’ DPs whose reference is obtained through grammatical anchoring via a D-chain, the nominal counterpart of a T-chain. On the other hand, underspecified DPs, for example certain null subjects and bare N subjects, are parallel to RIs in that they lack a D-chain and are therefore grammatically unanchored structures.

In Section 2, we established that children by and large observe the requirements of Spec-Head agreement. We assume that the presence or absence of finiteness on the verb is determined by the functional specification within the subject DP with which it agrees. Assuming that a null subject does not carry a specification for number, the verb likewise should be unspecified for number, hence non-finite. The correlation between RIs and null subjects bears out this expectation.

It can be seen from Table 11, however, that despite the high frequency of null subjects in RI-utterances, there are also a fair number of overt subjects with non-finite verbs. This result is not surprising once we understand that not all overt DPs have equal status. In our analysis, we distinguish between specified DPs (=finite DPs), whose anchoring is visible either through a definite determiner or a plural marker, and unspecified DPs, consisting of bare Ns (e.g. *doggie*). We also take pronouns to be specified DPs since they occupy the D-head. Given that bare-N DPs are not marked for the agreement features relevant for number, they should freely occur as subjects of RIs. Alternatively, specified DPs (pronouns, DPs with determiners, plurals) can license an inflected verb, but they should not in principle occur with RIs. Consider Table 13, where we lay out the different DP-types that occur with finite and non-finite utterances in Dutch child language.¹²

Table 13
Distribution of overt subjects for Dutch children (Niek and Hein)

	Non-finite V		Finite V	
	<i>n</i>	%	<i>n</i>	%
Overt Det	4	1%	382	99%
Plural	2	1%	180	99%
Pronoun	169	4%	4407	96%
0-det (bare N)	28	6%	423	94%

As expected, specified DPs occur overwhelmingly with finite verbs. Infinitives, on the other hand, which are negatively marked for finiteness, do not occur with specified DPs, again as predicted. Somewhat unexpected in this table is the fact that 0-dets also occur with finite verbs in the majority of cases (e.g. *hondje zit hier* ‘doggie sits here’). Hoekstra and Hyams (1997) explain this in the following way: the verb form in these cases is the singular form, which in Dutch, as in many languages,

¹² The analysis and counts of Hein’s data was done by Yvonne Heynsdijk, whose help is hereby gratefully acknowledged. The category Det includes determiners and demonstratives, but not quantifiers.

is the default form. We understand ‘default’ here in a very specific sense to mean that a marked form (i.e. third person singular) is licit without there being a specified nominal subject that licenses its features. This status can be more directly observed in the use of default forms in impersonal constructions, such as impersonal passives (e.g. *Er wordt gelachen* ‘there is laughed’ = People are laughing.) which lack any kind of nominal subject. Note that being default does not mean being exempt from agreement requirements. Agreement requires non-conflict of features. Therefore, even though it is a default form, the third person singular verb form may not take a subject that conflicts with its features (e.g. a first person singular subject). The notion of default just means that the form is licit even if there are no features that it corresponds to in the specifier.

Let us now turn to English, and consider the same partitioning of subject types. In Table 14 we have collapsed the various types of specified DPs (pronouns, DPs with overt determiner, and plurals), and we contrast them with bare-N DP’s (0-dets).

Table 14
Distribution of overt subjects for English children (Nina and Adam)

	Non-finite V		Finite V	
	<i>n</i>	%	<i>n</i>	%
Specified DP	406	32%	877	68%
0-det	96	92%	8	8%

The most noteworthy observation in this table is that 0-det DPs are virtually excluded with the finite *-s* form. This difference with Dutch is immediately explained once we realize that the *-s* form in English is not a default form, unlike the Dutch *-t* form. As a marked and non-default form, it is licit only if its feature specification is licensed by agreeing features in the specifier. Since 0-det DPs do not have these features specified, it will not license the *-s* form.

The second way English differs from Dutch concerns the occurrence of fully specified DPs with the non-finite (bare) form (32%) (e.g. *the doggie bark*). This kind of subject is excluded with Dutch infinitives since infinitives are marked as non-agreeing forms, as noted above. This is not the case for the English bare form, however. The English bare form is not negatively marked for agreement, but just unmarked. The difference between the bare form and a real infinitive is crucial and is responsible for a range of differences in the two languages. Since Spec-head agreement is formulated as a non-conflict condition, the occurrence of a specified DP in the specifier of an unmarked form does not trigger a Spec-head agreement violation. Hence, we find in early English, the examples in (14a) while we do not find the Dutch examples in (14b).

- (14) a. The doggie/he bark.
 b. *Het hondje /hij hier zitten.
 the doggie /he here sit-inf.

Why then do adults not produce sentences such as (14a)? The difference with respect to agreement between the child's grammar and the adult grammar is that in the adult grammar the more specified form must be selected. This is a different requirement than Spec-head agreement, which merely requires non-conflict of features, and which is adhered to in both the child and adult grammar.

The result of this discussion is that functionally, the English bare form is ambiguous between an infinitive, i.e. an unanchored structure in our terms, and a finite form, i.e. an anchored structure,¹³ in which an unmarked form is selected rather than the more specific marked form. This ambiguity of the bare form resolves many of the problems raised by Wexler's conjecture. On the one hand, the English bare form, because of its unmarked status, occurs with the full range of subject types. This accounts for the higher percentage of lexical subjects occurring with bare forms than with real infinitives (cf. Table 11). On the other hand, the dual function of the bare form accounts for its overall higher frequency as compared to RIs (cf. Table 4).

The fact that the form that functions as an infinitive is a bare form in English, while it is a marked form in the other languages that we discuss, means that while V raises to Infl in the latter languages, Infl does not attract the bare form in English. This difference accounts directly for the asymmetry that we observed in Table 12 with respect to infinitival WH-questions. We follow Rizzi (1990) in assuming that in WH-questions a WH-feature raises from Infl to C. In English, this movement may take place as pure feature movement, whereas in the languages with a real infinitive, feature movement necessarily affects the entire category, i.e. the infinitival verb form (cf. Chomsky, 1995). As the infinitive is marked as a non-agreeing form, this results in ungrammaticality. We refer to Hoekstra and Hyams (1997) for further discussion of WH-questions in English vs. real infinitive languages.

In this section we have established that a true infinitive is different from the bare form in English. This difference allows us to understand (a) the quantitative differences in frequency between RIs built on real infinitives and the bare verb form construction, (b) the distribution of subject types, and (c) its occurrence in WH-questions. In the next section we will address the question of whether this difference between real infinitives and the English bare form is also responsible for the differences we find with respect to the Eventivity Constraint and the modality of the constructions, discussed in Section 3. Note that by discarding the Null Modal Hypothesis we are left with the question of what the observed modality of RIs stems from, and how this relates to the Eventivity Constraint. It is to these questions that we now turn.

¹³ The question of what it means for a form to be finite or non-finite is not so easily answered. We can isolate, on syntactic grounds, positions where infinitives are required (e.g. after *to*, as in *to be happy*), as well as positions where finite forms are required (e.g. in *that*-complements, as in *that he is happy*), where different forms of the verb occur, if there are such different forms available. Given the poverty of English inflection, this is most often not the case, as in *to go there* and *that you go there*. This situation can be approached in two ways: one is to enter the form *go* twice (or more often), with different feature matrices; the other is to have one unmarked form, chosen as the elsewhere form if the context does not require a more specific form. It is the latter approach that we opt for. Hence, the bare form is marked neither as an infinitive nor as a finite form, but is compatible with syntactic positions of either sort.

5. Modal reference and the Eventivity Constraint

4.1. The modality of infinitives

Although an infinitive is not inflected for person, number or tense, it is not a stem form either. Hence, the analysis of the infinitive should not only be negative, that is, in terms of absence of tense and agreement, but should also address the relevance of the infinitival morpheme itself. The absence of an infinitival affix in the English bare form has consequences for its interpretation. Giorgi and Pianesi (1997) note that the English bare form denotes not only the processual part of an event, but includes the completion of that event. In this respect it differs from real infinitives, as the contrasts in (15) show.¹⁴

- (15) a. *I see John cross the street.
 b. I saw John cross the street.
 c. Ik zie/zag Jan de straat oversteken.
 I see/saw John the street cross-INF
 'I see/saw John cross the street.'

Giorgi and Pianesi argue that English verbs have the feature [+perfective]. Hence, the bare form complement denotes the entire event, including its completion. This is incompatible with the present tense of *see*, but it is compatible with the past tense *saw*, whence the contrast in (15a,b). The Dutch infinitive, in contrast, is not inherently perfective, but may refer to the processual part of an event. In this respect, it is like the English *-ing* form, which may occur in the complement of present tense perception verbs as well (cf. *I see John crossing the street*). The other Germanic languages, as well as the Romance languages, all of which have genuine infinitives, all work like Dutch in this respect.

As a non-finite form, the infinitive contrasts with the participle in an aspectual sense. Whereas a participle refers to the completion of an eventuality, the infinitive denotes that the event is not yet realized. This aspectual value of the infinitive makes it understandable that in the Romance languages, the future tense is built on the infinitive, cf. French *j'arriver-ai* 'I shall arrive', built on *arriver* 'arrive-INF'.

¹⁴ Giorgi and Pianesi note that the reason for the ungrammaticality of (15a) is basically identical to the reason why event-denoting verbs cannot occur in the simple present in English. As is well known, this restriction only applies in as far as such sentences are denoting ongoing events. So, under any kind of quantification, the simple present with event-denoting verbs is fine, as in (i).

- (i) a. John often visits his parents.
 b. When John visits his parents, he ...

Neil Smith (p.c.) observes that the bare verb complementation in (15a) is equally fine under quantificational conditions, as in (ii):

- (ii) a. I can see John cross the street.
 b. Whenever I look out of the window these days, I see John cross the street.

That the completion of the observed event is nevertheless included can be seen in the oddness of (iii). Its Dutch translation with an infinitive does not have this oddness.

- (iii) ?? I saw John cross the street when he was hit by a car.

We want to argue that it is this aspectual value of [–realized] that is the basis for the modal interpretation. Children’s RI-utterances contrast with finite utterances precisely in this respect: while finite utterances describe actual states of affairs, RIs do not refer to actual eventualities, but to eventualities that are not realized, and are therefore interpreted as statements of desire with respect to these eventualities. Importantly, children’s RIs are very similar to RIs in adult language in this respect. Adult RIs have a much more restricted use, but to the extent that they occur, they have a similar [–realized] aspectual value, with an imperative or counterfactual meaning. Consider the following two categories of adult RIs (cf. Wijnen, 1996).¹⁵

(16) *jussives*

Hier geen fietsen plaatsen!
 here no bicycles place-inf
 ‘Don’t put bicycles here!’

(17) *Mad Magazine sentences*

Jan met mijn zus trouwen?! Dat nooit.
 John my sister marry-inf. That never.

Jussives are closest to the kinds of RIs used by children. Like most of the children’s RIs, they involve deontic modality. The category of Mad Magazine sentences likewise denotes non-realized eventualities. The possibility of the eventuality is mentioned, which is then commented on in the next statement. So we maintain that the modal interpretation of children’s RIs is determined by the inherent quality of infinitives as being marked [–realized]. And this is a feature of adult RIs as well.

It is important that the modality is indeed present in the structure of RIs itself. In this respect, our analysis contrasts with a recent analysis of the modality of German RIs provided by Ingram and Thompson (1996). While Ingram and Thompson also reject the Null Modal Hypothesis, they present an explanation of the modality of RIs in terms of a model which we may call ‘Acquisition by Association’. According to this model, children produce RIs because they form a semantic association between the infinitive and modal meanings. This association is based on the input they receive, sentences in which the infinitive occurs in the context of an overt modal. For example, the German child will hear connected discourse as in (18) or complex sentences such as (19), in which the infinitive occurs with the modal *willen* (want).

¹⁵ Wijnen also mentions as an instance of an adult RI an infinitival response, as in (i):

- (i) a. Wat ben je aan het doen?
 What are you at the do-INF = ‘What are you doing?’
 b. Plaatjes draaien.
 Records play-INF = ‘Playing records’

However, (ib) is not a RI-utterance, but a kind of nominal infinitive. Such an infinitival response is impossible with full object DPs, or other material typical of full clauses, as shown in (c).

- c. *mijn nieuwe plaatje draaien.
 my new record play-INF = ‘Playing my new record’

- (18) Was will der? Mit dem Auto fahren?
 What wants he? With the car drive-INF?
- (19) Ich glaube der will mit dem Auto fahren, wohl?
 I think he wants with the car drive, right?

As a result of such input the child comes to ‘associate’ modality with the infinitival form of the verb. Ingram and Thompson propose that in language acquisition ‘what [the children] hear, is what you get’. They claim that “children will by the nature of their conservative learning strategies show surface forms that look like the input language to which they are exposed”. (Ingram and Thompson, 1996: 101).

In one sense, Ingram and Thompson’s claims are trivially true; a child exposed to English acquires English, not Swahili. In another sense, however, the claim is quite simply false since children produce all sorts of things that they do not get in the input, for example, overgeneralized forms such as *goed* instead of *went* and *mouses* instead of *mice*, sentences with missing functional elements, such as *Teddy sleeping, Where dragon?* So, if it is true that children are conservative and stick to what they hear, why do they so often go astray, producing forms distinct from adult forms, but which nevertheless have a systematicity of their own?

We agree with Ingram and Thompson that children’s RIs have a modal meaning. The difference between their view and ours is that they assume that the modal meaning comes about through the child’s associating infinitives with modals in the input, while our position is that the modal meaning is based on an element that is part of the grammatical representation of the RI, viz. the infinitival morpheme. The fact that RIs also occur – be it in a much more limited way – in adult grammar with a modal meaning, supports our view. Ingram and Thompson’s association model begs the question of why the infinitives in the adult language also have a modal value (cf. examples (16) and (17)). Moreover, the claim that the modal value is assigned to infinitives on the basis of input with overt modals predicts that English speaking children’s bare forms should also have a modal value since they too occur in the input with modals (viz. *John can/may/will go.*). As we noted earlier, the bare forms produced by English speaking children typically do not have modal value (cf. Table 9). Our analysis explains this difference between English and languages with true infinitives.¹⁶

¹⁶ Ingram and Thompson also argue that children are conservative in their acquisition of inflectional morphology, representing individual inflected verb forms holistically rather than as morphologically complex forms. Thus, for such a child *kommt* ‘comes’ is not grammatically related to *geht* ‘goes’ or any other third person singular verb since the child does not analyze the *-t* suffix. In a similar fashion, it must be that the child does not relate *gehen* ‘go-inf’, *kommen* ‘come-inf’ or any other infinitival form since infinitives are also morphologically unanalyzed. Ingram and Thompson’s child does not have any verbal categories, in fact. There is no category of ‘infinitive’ and hence no way of capturing any generalization over this category, including the one that forms the basis of their paper, that infinitives have a modal value. They also have no way of describing the various syntactic generalizations distinguishing finite and non-finite forms discussed in the text and elsewhere.

5.2. The eventivity constraint

Now that we have established the source of the modality of RIs, we are in a position to address the question about the source of the Eventivity Constraint. Let us first look somewhat more closely at a particular aspect of modality.

As is well known, modal verbs are crosslinguistically ambiguous between epistemic and deontic readings. This ambiguity is triggered not by a lexical ambiguity in the modal itself, but rather is determined by the nature of the complements with which it combines. Let us consider the modal *must*, which denotes necessity.¹⁷ When combined with a stative predicate, we normally obtain the epistemic reading: the truth of the state denoted by the complement is evidentially necessary, e.g. in view of the available evidence. Alternatively, the state denoted by the complement can be said to be necessary in order to comply with some condition. Consider the following examples:

- (20) a. John must be British
 b. If Bill wants to qualify for this job, he must know French

(20a), a pure case of epistemic modality, states that, based on some kind of evidence, it is necessarily true that John is British. In (20b), where necessity comes out as a requirement, Bill's knowing French is presented as a necessity for him to qualify for a job.

When combined with an event-denoting complement, on the other hand, *must* doesn't denote the necessary truth of the event, but rather the necessity of the event taking place, i.e. deontic modality. Since the event itself cannot be evaluated as to its truth, *must* is prospective. This is illustrated in the examples in (21), where (21a) asserts that at the moment of speech there is some obligation for some future event to take place, and (21b) similarly asserts that there is future event of tearing down the house that must happen.

- (21) a. John must read this book
 b. The house must be torn down

We see, then, that deontic modality arises in combination with event-denoting predicates, while epistemic modality is typically found with state-denoting predicates. More or less the same can be observed in Dutch. Consider the following examples:

- | | | | |
|------|--|---------|-----------|
| (22) | | deontic | epistemic |
| a. | Jan moet/kan het antwoord weten.
John must/can the answer know. | ? | + |
| b. | Jan moet/kan dit boek lezen.
John must/can this book read. | + | ? |

¹⁷ We are obviously not interested in alethic truth.

The epistemic reading is most easily available in (22a). It is possible to give a deontic reading, but that requires an eventive, i.e. inchoative, interpretation for *know*, viz. as ‘come to know’. Conversely, with an event denoting complement, as in (22b), the deontic reading is the most easily accessible reading. The epistemic reading can also obtain, but requires an imperfective reading of the infinitive, something which is possible in Dutch, but not in English since the English bare form is inherently perfective, as we discussed above. So, the epistemic reading of (22b) is basically identical to the epistemic reading of English sentence *John must be reading this book*, with the progressive, while the deontic reading is equal to (21a).

The relationship between stativity and epistemic readings can also be brought out by considering unambiguously epistemic predicates, such as *seem* and *believe*. As is well-known, these complements require stative predicates when infinitival, as shown in (23) and (24).

- (23) a. John seems to know French.
 b. John seems to be reading this book.
 c. John seems to have read this book.
 d. *John seems to read this book.
 e. John seems to dance.
- (24) a. Jan schijnt het antwoord te weten.
 b. Jan schijnt dit boek gelezen te hebben.
 c. Jan schijnt dit boek te lezen.

Again, while the English example in (23d) is ungrammatical, since it only allows a perfective event interpretation, the Dutch (24c) is grammatical because the infinitive can be construed as continuous, without perfectivity, and hence gives rise to a reading similar to (23b). (23e), with the event-denoting verb *dance*, is grammatical, but only has the reading of ‘John being a dancer’, hence a stative (property reading), not that of ‘he seems to be dancing’.

We therefore conclude that epistemic modality requires states, while deontic modality requires events. To the extent that RIs occur with stative predicates, most notably *hebben* ‘have’, the deontic modal imposes an inchoative interpretation on it, so that *Thorsten Ball haben* (‘Thorsten ball have’) means ‘Thorsten must get the ball’.

Barbiers (1995: Ch. 5) provides an explanation for these correlations. He argues that modals are not inherently ambiguous between epistemic and deontic meanings, but that the difference between these two readings comes about as a function of different scales upon which the modal operates. In the case of epistemic modality, this scale involves the truth value of the proposition that the modal modifies, ranging from 0 (false) to 1 (true), with *moeten/must* taking the value 1, and *kunnen/may* taking some intermediate value on the scale of 0 to 1. Deontic modality, on the other hand, involves what he calls a ‘polarity transition’, the scale referring to the necessity or probability of the transition taking place. The expression *moeten/must* P, where P is the proposition modified by the modal, presupposes that P is not the case, and states that the transition from not P to P is required. With *kunnen/can* modality,

the transition is said to possibly take place. Hence, *John must have a gun* presupposes that 'John has a gun' is not the case, and requires a transition so that 'John has a gun' is the case. Given this transition, P cannot be a stative predication, but requires predications of an eventive nature. For our purposes here, we can summarize these observations as in (25).

- (25) Epistemic modality is found in combination with stative predicates.
Deontic modality is found in combination with event-denoting predicates.

Let us assume that (25) is correct. The next important result that has been widely established in the literature is that children under three years of age do not seem to have the an epistemic use of modality (Wells, 1979; Shepherd, 1981; Pea et al., 1982; Stephany, 1986) We remain agnostic as to the reason for this developmental delay of epistemic modality, which may be either of a purely linguistic nature, or determined by a delay in the child's conceptual development. However, this early restriction to deontic modality coupled with the result in (25) provides an immediate account of the EC. As deontic modality is the only modality that children have at their disposal, the fact that only event-denoting complements are found in modal environments is a consequence of this restriction.¹⁸

A final point about the modality of RIs concerns the observation that they seem to express boulemaic (desiderative) modality, i.e. that *Thorsten Ball haben* would mean 'Thorsten wants to have the ball' rather than 'Thorsten must have the ball'. These readings are obviously hard to distinguish. As argued in Hoekstra (1994), deontic modality, which involves 'obligation' or 'permission', has two parameters: the source of the obligation/permission and the target of the obligation/permission. Consider the following examples.

- (26) a. Jan moet meespelen (van zijn vader).
John must with-play (of his father)
'John is required (by his father) to play with the team'. or
'It is required (by John's father) that John play with the team.'
b. Er moet een doelpunt gescoord worden.
there must a goal scored become
'It is required that a goal be scored'.

¹⁸ An alternative way to think about the eventivity constraint is in terms of denotata. Eventive predicates denote objects in the world, viz. events, at least when they have an on-going activity interpretation. Statives, on the other hand, denote properties of their subjects. This idea is inspired by the distinction argued for in Kratzer (1989), according to which events, but not states have an event argument. Following our idea that RIs receive their temporal reference through discourse context, that is, T functions like a free pronoun, it can only refer to objects in the world, and hence not to properties. For this reason stative RIs are excluded. We initially took this line of reasoning (Hyams and Hoekstra, 1995; cf. also Wijnen, 1996; Avrutin, 1996), but rejected it later on. One problem for this proposal is that the overwhelming majority of RIs in Dutch, German, etc. do not refer to on-going events, but rather have a modal interpretation. This is unexplained on a denotational account.

Consider first the target of obligation. (26a) is ambiguous in this respect. The obligation to play with the team may be directly on John, viz. John's father orders John to play with the team. Alternatively, the target of obligation might be someone other than John, viz. the coach of the team must put John on the team, or the other children must allow John to play with them, etc. The availability of this second reading is clear in (26b), where the obligation cannot be on the subject 'a goal'. As (26a) shows, in Dutch the source of the obligation may be overtly specified by a *van*-phrase, here by *van zijn vader*. We would like to argue that in children's RIs, it is the child, i.e. the speaker, who is the source of the obligation. This makes a deontic modal very much like a boulemaic modal, which is equally prospective, and where the subject is also the source of the desire.

Let us now return to English. Recall from Section 3 that English bare form utterances are qualitatively different from RIs in other languages in not having modal reference, and also in not being subject to the EC. We are now in a position to explain this result. Since the modality of RIs is connected to the infinitival morpheme, we do not in fact expect English bare forms to induce modal interpretations. And since the sensitivity to the EC is a direct consequence of the kind of modality inherent in RIs, neither do we expect English bare form utterances to be subject to the EC. The English bare form, though functionally an infinitive, is very different from a true morphological infinitive. This difference manifests itself most clearly in child language because there exists a stage in which infinitives can be used more freely (i.e. in root contexts). Yet, the difference is not limited to child language, but also shows up in the limited use of unanchored infinitives in the respective adult languages. Consider the jussive and Mad Magazine sentences discussed above. In Dutch these are subject to the EC, just like children's RIs in Dutch are. This is shown in the examples in (27)–(28). On the other hand, remarkably, the only adult English type of bare form construction, the Mad Magazine sentences, does not seem to be subject to the EC. Thus (29) is fine.

(27) *jussives*

*Morgen alle antwoorden weten!
tomorrow all answers know-INF

(28) *Mad Magazine Sentences*

*Jan alle antwoorden weten?! Dat geloof ik niet.
John all answers know-INF?! That believe I not.

(29) John know all the answers?! I don't believe it.

6. Concluding remarks

By way of conclusion, let us add a few words concerning the difference between children and adults with respect to the use of RIs. As just noted, RIs are not ungrammatical in adult grammar, but simply have a much more limited use. We assume that this difference between adults and children does not reflect a grammatical difference

between the two populations, but rather a difference at the interface of grammar and discourse. Broadly put, children seem to have more options available to satisfy interface requirements. Functional categories stand squarely at the interface of grammar and discourse; C is the grammatical expression of the pragmatic force of a sentence, whether interrogative, emphatic, declarative, etc., D is responsible for the referentiality of nominal expressions, and I carries the finiteness which fixes the temporal reference of a sentence vis-a-vis speech time. These categories anchor the sentence into a discourse representation and there is, we believe, an inherent tension between the grammar and extragrammatical mechanisms with respect to this anchoring. In the adult system the grammar generally wins out, while in the child's system there is a greater reliance on discourse, and presuppositional information.

On our analysis, RIs are unanchored structures in which the eventuality is not fixed through the grammatical mechanism of syntactic binding of a variable by a syntactic operator. Rather, it is discursively interpreted in the manner of a free pronoun. Pronoun resolution depends on discourse and other contextual and presuppositional information. There is a tension between syntactic binding and pronoun resolution, along the lines discussed above. As Table 8 shows, the predominant reading for the English bare V-construction is a temporal here-and-now (or past) interpretation. In other words, the child's bare form construction, in as far as it instantiates an unanchored structure, has a reading which is indistinguishable from a properly anchored (i.e. finite) structure. When this situation arises in the adult system, that is, the situation in which a reading obtained through syntactic binding is indistinguishable from a reading obtained through free pronoun resolution, the grammatically determined interpretation takes precedence (cf. Reinhart, 1983, and later work for this perspective in the case of pronouns). Thus, RIs are normally blocked in the adult system except in particular registers (e.g. Mad Magazine sentences). In the child's language, in contrast, both the grammatical and discourse-related mechanisms are available in the interpretation of functional material. This lends some substance to the intuition often expressed that children's language is more heavily discourse dependent than the adults'.

In Dutch and other languages, where RIs are inherently modal, the competition does not come from the alternative in which the infinitive is replaced by a finite verb, but rather from a structure with an overt modal (eg. *Papa moet de toren bouwen* 'Papa must build the tower'), the latter representing the grammatical solution. In such languages, the unanchored RI does not receive the here-and-now interpretation of the English bare V because the infinitival morpheme imposes a modal reading. This difference between English and the RIs languages with respect to the locus of the competition accounts for the often noted fact that RIs in child language decline in tandem with the rise of modal verbs (cf. a.o. Jordens, 1991, Wijnen, 1994). Our expectation for English, yet to be tested, is that the bare V-forms will decline relative to deictic finite forms, while the proportion of modal sentences will remain roughly constant.¹⁹

¹⁹ We would include here not only sentences with true modals such as *can*, *must*, *should*, etc. but also expressions of modality such as *hafta*, *wanna*, *gonna*, *oughta*, and so on.

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