

The Eventivity Constraint and Modal Reference Effects in Root Infinitives

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0. Introduction

In this paper we focus on the interpretive properties of Root Infinitives (henceforth RIs). As we will show, there seems to be a constraint on the aspectual nature of the verbs occurring in RI-constructions, viz. only eventive verbs are allowed in such constructions; stative predicates occurring during this same period typically require finiteness. We refer to this as the Eventivity Constraint (EC). Also, RIs typically do not get a deictic tense interpretation, but rather receive a modal interpretation, henceforth the 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. This is 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; (iii) how does the MRE relate to the Eventivity Constraint; (iv) why is English different?

1. Root Infinitives

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, (RIs), as in (1).

- (1) a. Papa schoenen wassen.
Daddy shoes wash-inf.
b. Michel dormir.
Michel sleep-inf.
c. Thorstn das haben.
Thorstn that have-inf.

- d. Jag också hoppa där å där.
I also hop-inf. there and there

Wexler (1994) has argued that English speaking children also show an RI-stage. Utterances of the sort in (2), where the verb is missing the 3rd person singular -s, are analyzed by Wexler as the English analogue of the RI.

- (2) a. Eve sit floor.
b. Cowboy Jesus wear boots.

Despite the theoretical appeal of Wexler's conjecture, we will show that there are important differences between the English bare form and the root infinitive in the other languages studied. We will argue 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. The Eventivity Constraint and the Modal Reference Effect

Various studies have shown that in the early stages of language development verbal inflections distribute selectively over different aspectual classes of verbs (cf. Antinucci & Miller 1976, Shirai & Anderson, 1995, Bloom et al. 1980 a.o.). The link between inflection and aspectual class raises the question as to whether there are particular aspectual properties associated with RIs. Jordens (1991) noted that stative verbs are exclusively finite, or, put differently, that RIs do not admit stative predicates, but rather, require event-denoting predicates (cf. also de Haan 1986). We formulate this as the Eventivity Constraint (EC), as in (3):

- (3) *The Eventivity Constraint (EC)*
RIs are restricted to event-denoting predicates

Wijnen (1996) provides relevant quantitative data from 4 Dutch children.[1] Out of 1883 RIs in their corpora, 1790/1883 or 95% are eventive verbs, and only 93/1883 or 5% are stative verbs. In contrast to the RI situation, Wijnen finds that the finite verbs are evenly split between eventive and stative verbs. These results are shown in table 1.

Table 1: Inflection of eventive and non-eventive verbs in 4 Dutch children (based on Wijnen, 1996)

	finite	RIs
eventive	350	1790
non-eventive	349	93
total	699	1883

Ferdinand (1996) observes that there is an eventivity constraint in early French as well. A particularly good example of the EC at work in French is Ferdinand's observation that the verb *aller* 'go' occurs as an RI only in its main verb use, viz. *Mama aller*, while as an inchoative auxiliary it is always finite. Thus we find *Mama va aller*, but not **Mama aller manger* 'Mama go(es) to eat'. In Russian, there is a similar eventivity constraint on RIs. While the number of RIs in early Russian is relatively small, Van Gelderen & 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 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. Van Ginneken (1917) was the first to note that RIs typically have a modal interpretation. More recently, Hoekstra & Jordens (1994) argue for the modality of Dutch RIs on the basis of patterns of negation. Plunkett & Strömquist (1990) make the same observation concerning the modality of RIs for Swedish, Ingram & Thompson (1996) for German, and Meisel (1990) and Ferdinand (1996) for French. Wijnen (1996) provides the following quantitative data on the reference of Dutch RIs.

Table 2. Temporal reference of RIs and finite verbs in 4 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

Table 2 shows 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):

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

With overwhelming frequency, RIs have modal interpretations.

Given that there is no overt expression of modality, 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.[2] Some examples follow.

- (4) 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.'

In English the situation is very different: neither the EC nor the MRE seem relevant to the English bare form phenomenon. With regard to eventivity, Ud Deen (1997) checked the distribution of finiteness across eventive and non-eventive verbs (*know, need, want*) in the files of Adam and Eve (Brown, 1973; MacWhinney and Snow 1985). He found numerous examples of bare stative verbs such as in (5).

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

Table 3 reports the quantitative results of Ud Deen's analysis.[3]

Table 3. 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 in contrast to Dutch RIs, the English bare form is not at all limited to eventives; approximately 25% (65/264) of the bare verbs are non-eventive, while only 5% of the Dutch RIs are (cf. table 1). 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. [4] 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 4, 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. This is in contrast to Dutch, where 86% of RIs have a modal reading. In fact, there is little difference between the reference of bare forms and finite forms. As might be expected, the predominant reference for finite verbs is temporal. Only 11% of the finite verbs have a modal reading, 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 2).

Table 4. Temporal reference of bare and finite forms in English (Adam and Eve) (based on Ud Deen, 1997)

	past	present	future/modal	total
bare form	59 (22%)	171 (65%)	34 (13%)	264
finite form	33 (37%)	46 (56%)	10 (11%)	89
total	92	217	44	353

On the basis of this evidence we conclude that the bare form in English is not subject to either the EC nor to the MRE. The fact that English is different in both respects from the other languages studied, suggests that the EC and the MRE are related. Having laid down the empirical groundwork, let us try to explain the EC and MRE, and why English differs from Dutch and other languages in not showing these effects.

3. The Null Modal Hypothesis

A possible explanation for the EC and MRE takes the form of a two-part hypothesis, as in (6), which we will refer to as the Null Modal Hypothesis (NMH):

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

Various suggestions leading to such a hypothesis can be found in the literature. Plunkett & Strömquist (1990), Boser et al. (1992), Krämer (1993) all adopt some form of the hypothesis in (6i). Ferdinand (1996) goes one step further in suggesting that not only do RIs have a null modal, but also that modals select eventive predicates (6ii).

Despite its explanatory potential, the NMH runs into a number of theoretical and empirical problems. The gist of many of these problems is the NMH obliterates the morphosyntactic distinction between finite utterances and RIs; RIs are covert finite clauses and hence should pattern as such. But in fact there are a number of important differences between RIs and finite utterances, many of which have been noted in the literature. Limitations of space prevent us from discussing these findings in detail, so we will simply note them. (For discussion see Hoekstra & Hyams 1998 and references cited there.) RIs do not allow non-subject topics in V2 languages, while finite verbs do. In Dutch, German, Swedish and French, WH-questions are virtually absent in non-finite utterances, though these languages clearly have non-WH RIs. The vast majority of RI subjects are null, while the subjects of finite verbs are lexical. The hypothesis also fails to provide a basis for explaining the fact that certain child languages exhibit an RI stage while others do not (cf. Hoekstra & Hyams 1995); why would Dutch, German have null modals but Italian and Spanish not? We thus reject the NMH. We will argue that RIs are genuinely infinitival, and moreover, that the infinitival morphology itself is crucial to explaining the interpretive properties of RIs, as distinct from the English bare form, which is not a true infinitive.

4. Modal Reference and the Eventivity Constraint

4.1 The modality of infinitives

Giorgi & Pianesi (1996) note that the English bare form denotes not only the processual part of an event, but includes the completion of that event. It has a [+perfective] feature. Thus, the English bare form is incompatible with the present tense of *see* in (7a) but it is compatible with the past tense *saw* in (7b). [5] In this respect the English bare form differs from a real infinitive, as in language such as Dutch, which is not inherently perfective, and hence may refer to the processual part of an event, as in (7c).

- (7) 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'

In this respect, the Dutch infinitive 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.

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. 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 in this respect to RIs in adult language. 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).

(8) *jussives*

Hier geen fietsen plaatsen!
here no bicycles place-inf
"Don't put bicycles here"

(9) *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 (and adult RIs) is determined by the inherent quality of infinitives as being marked [-realized]. [6]

4.2 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, crosslinguistically modal verbs are 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. 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, as in (10).

(10) John must be British

The sentence in (10), a pure case of epistemic modality, states that based on some kind of evidence, it is necessarily true that John is British.

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 example in (11), which asserts that at the moment of speech there is some obligation for some future event to take place.

(11) John must read this book

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.

	deontic	epistemic
(12) 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.	+	?

The epistemic reading is most easily available in (12a). It is possible to give a deontic reading, but that requires an eventive, i.e. inchoative, interpretation for *know*, viz. 'come to know. Conversely, with an event-denoting complement, as in (12b), 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 discussed above. So, the epistemic reading of (12b) is basically identical to the epistemic reading of the English progressive sentence *John must be reading this book*, while the deontic reading is equal to (11a).

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 (13) and (14).

- (13) 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.
- (14) 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 (13d) is ungrammatical, since the verb only allows a perfective event interpretation, the Dutch (14c) is grammatical because the infinitive can be construed as continuous, without perfectivity, and hence gives rise to a reading similar to (13b). (13e), 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'.

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

Let us assume that (15) is correct.[6]

The next important result that has been widely reported in the literature is that children under three years of age do not have the epistemic use of modality (Wells, 1979, Stephany, 1986 a.o.) 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 generalization in (15b) provides an immediate account of the EC. As deontic modality is the only modality that children have at their disposal, then only event-denoting complements are found in modal contexts, i.e. in RIs.

We now return to the English bare form, which, recall, differs from RIs 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 directly to the infinitival morpheme, a modal interpretation should not arise in the English bare form, which lack the relevant morphology. And since 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. [7] 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. also 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, as is shown in the examples in (16a,b), just like RIs in child Dutch are. 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, as illustrated by the grammaticality of (16c).

- (16) a. *Morgen alle antwoorden weten!
 tomorrow all answers know-INF
 b. *Jan alle antwoorden weten?! Dat geloof ik niet.
 John all answers know-INF?! That believe I not.
 c. John know all the answers?! I don't believe it.

With note finally that our hypothesis that the modality is present in the structure of the RI itself contrasts with the recent analysis of Ingram & Thompson (1996), who claim that the modal reading arises because children form a semantic association between the infinitive and modal meanings based on the input they receive, for example, sentences in which the infinitive occurs in the context of an overt modal (eg. *Ich glaube der will mit dem auto Fahren, wohl?* 'I think he wants with the car drive, right?'). The fact that RIs also occur in the adult language with a modal meaning (though the frequency of adult RIs is much lower) supports our view that it is part of the grammatical representation of the RI (viz. in the infinitival morpheme).[8]

Notes

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1. 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 & Snow 1985).

2. 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 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?'

3. 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 & Snow 1985).

4. 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 (see Hoekstra & Hyams 1998 for discussion).

5. Giorgi & Pianesi note that the reason for the ungrammaticality of (7a) 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 denote 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 (7a) 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, I see John cross the street.

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

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

6. See Barbiers (1995:ch. 5) for an explanation for these correlations.

7. 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 (cf. Hoekstra & Hyams 1995), it can only refer to objects in the world, and hence not to properties. For this reason stative RIs are excluded. We began with this line of reasoning (Hyams & Hoekstra 1995, cf. also Wijnen 1996 and 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.

8. Also, Ingram & Thompson's associationist model predicts that English speaking children's bare forms should also have a modal meaning since they too occur with modals in the input (eg. *John may/will go*.)

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Past Time Reference in Chinese Children's Speech

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1. Introduction

Research on child language acquisition has shown that children's speech at the early stage of development is restricted to the 'here and now' (Brown, 1973; Eisenberg, 1985; Sachs, 1983; Weist, 1989). Thus, the development of the ability to refer to objects and events displaced in time from the present situation is crucial for children to become competent speakers.

Previous studies on the acquisition of temporality have largely focused on the morphological marking of tense and aspect (Andersen & Shirai, 1995; Antinucci & Miller, 1976; Bloom et al., 1980; Bronckart & Sinclair, 1973; Li, 1990; Weist, et al., 1989). However, this 'inflectional paradigm bias' yields an incomplete picture since it ignores various other means available to express temporality (Klein, 1995). The purpose of this study is to go beyond this inflectional paradigm to investigate how two Chinese children (3;2 and 3;3) refer to the past in conversation. I adopt a broader approach, which encompasses morphosyntactic, semantic and discourse-pragmatic perspectives. This approach is especially suitable for studying Mandarin Chinese, which is a tenseless language. That is, Mandarin Chinese does not signal temporal relations with verb inflections. Therefore, in order to more fully understand the temporal system in Mandarin Chinese and the acquisition of this system by children, it is important to take into account the interplay of various linguistic and extralinguistic devices.

2. Research Questions

The research questions of this study are as follows:

- Q1: Have the children developed the ability to go beyond the here-and-now and refer to past events? What kinds of past reference are involved in the children's speech, immediate past reference or distant past reference?
- Q2: What is the children's interactive role in conversation involving past reference? That is, do they refer to the past spontaneously or do they rely on elicitation to refer to the past?
- Q3: How do the children initiate and establish past reference? What overt temporal markers do they use? What are the functions of these markers? When no temporal markers are used, how can the implicit temporal reference be inferred?