Modal Reference in Children's Root Infinitives

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1 Introduction

The Root Infinitive (RI) stage of linguistic development is a well-known phenomenon found in many child languages. This stage is characterized by the use of unsupported infinitival verbs in main clause contexts, as illustrated by the German, Dutch and French examples in (1). Wexler (1994) has proposed that the bare form used by English speaking children, exemplified in (1d) is the English analogue of a root infinitive.

(1) a. Papa schoenen wassen.
       Daddy shoes   wash-inf.
    b. Michel dormir.
       Michel sleep-inf.
    c. Auch Teddy fenster gucken.
       also teddy window look-inf.
    d. Want more apple.

There is an interesting constraint on the aspectual nature of RI verbs, by which we mean morphological infinitives, not bare participles, which is that they must be eventive. Stative verbs such as *know* and *want* occurring during this stage are always finite (Jordens 1991; Wijnen 1996; Ferdinand 199x). We refer to this as the Eventivity Constraint (EC). Also, RIs typically receive a modal interpretation rather than a present or past tense interpretation. We refer to this as the Modal Reference Effect (MRE). For exam-

ple, the sentence in (1a) means that something like 'Daddy must wash the shoes' or "I want Daddy to wash the shoes' and not 'Daddy is now washing the shoes' or 'Daddy washed the shoes'. Interestingly, both the EC and the MRE are absent from early English bare verb constructions. English children's RIs can be either eventive or stative verbs, and they generally have a temporal rather than modal reference (Ud Deen 1998). The fact that both these effects are found in Dutch, for example, and both are absent in English suggests that they are related phenomena. This is the position argued for in Hoekstra and Hyams (1998; henceforth H&H), who propose that the modality of RIs is inherent in the infinitival morphology of the verb, and that the EC follows from the fact that young children have only deontic modality which selects eventive predicates. Thus, the fact that English bare forms do not typically have modal reference follows from the fact that English lacks infinitival morphology; moreover, since there is no modal reference, there is also no EC. In this paper we will bring in additional evidence from early German, which is identical to Dutch in the relevant morphosyntactic respects. We will show that the account proposed in H&H extends naturally to German. We will also review two other accounts for the MRE, the Null Modal Hypothesis (NMH) proposed by Boser et al. (1992) and an input driven account proposed by Ingram and Thompson (1996). We will show that these accounts fall short in a number of respects.

We turn first to the details of the EC and the MRE, and relevant empirical support.

2 The Eventivity Constraint and the Modal Reference Effect

Wijnen (1996) notes that in child Dutch, RIs are overwhemingly eventive (95%), while finite verbs are evenly split between stative and eventive verbs. Wijnen's figures for four Dutch children are given in Table 1.

	finite	RIs	total
eventive	50% (350)	**95%** (1790)	2140
stative	50% (349)	**5%** (93)	442
total	699	1883	2582

Table 1: Eventivity and finiteness in Dutch (adapted from Wijnen 1996)

Similar results are reported for child French (Ferdinand 1996) and child Russian (Van Gelderen & Van der Meulen 1998).

It is also the case that children's RIs most often convey a modal-like interpretation. That is, the nonfinite verb often denotes a necessary, desired or

impending event. This is well-illustrated in the data of four Dutch children shown in Table 2.

	past	present	future/modal	total
RIs	3% (64)	**10%** (194)	**86%** (1625)	1883
finite	3% (21)	93% (657)	3% (21)	699

Table 2: Modal reference in Dutch RIs (adapted from Wijnen 1996)

(Data in table 2 were collected by G. Bol & E. Krikhaar, and by F. Wijnen.) The modal meaning of the RI is inferred from the linguistic and non-linguistic context of the utterance. Examples are given in (2).

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

As noted earlier, both the MRE and the EC are absent in early English bare verb constructions. We see in Table 3 that bare verbs are not limited to eventives; approximately 25% of bare verbs are noneventive, while only 5% of Dutch RIs are. The contrast with Dutch is even more striking when we look at the statives; the statives are overwhelming non-finite in English (65/73 or 89%) as compared to 21% (93/442) in Dutch.

	finite	RIs	total
eventive	91% (81)	**75%** (199)	280
stative	9% (8)	**25%** (65)	73
total	89	264	353

Table 3: Eventivity & finiteness in English (adapted from Ud Deen 1997)

Table 4 shows that English children's bare verbs generally have a deictic temporal interpretation, most often denoting ongoing activities, rather desired or required eventualities. (Data are collapsed across eventive and stative verbs.)

	past	present	future/modal	total
Bare V	22% (59)	**65%** (171)	**13%** (34)	264
Finite V	37% (33)	52% (46)	26% (10)	89

Table 4: modal reference in English RIs (adapted from Ud Deen 1997)

The English data are from Adam and Eve (Brown 1973, MacWhinney & Snow 1985). Only 13% of English RIs have a modal interpretation, as compared to 86% of Dutch RIs. We can see that the MRE is largely absent from the English bare-V construction.

2.1 Null Modal Hypothesis

The MRE, which we find in Dutch, might be accounted for by the NMH, proposed independently for German, Dutch and French by Boser et al. 1992, Krämer 1993, Ferdinand 1996. According to this view, children's RIs are just like adult expressions that involve a modal plus an infinitive, hence they are finite, except that the modal is not phonologically realized by the child. The structural representation of the null modal construction is shown in (3).

(3) [$_{CP}$ Papa$_j$ [$_C$ Ømodal$_i$] [$_{IP}$ t$_j$ ook [$_{VP}$ boot [$_V$ maken]] [$_I$ t$_i$]]]
    Papa   also   boat   make-inf
    "Papa also has to make a boat."

However, in postulating that RIs are really finite, the NMH fails to provide a basis for explaining the various syntactic differences that exist between finite clauses and RIs. For example, in German, Dutch and French, RIs do not occur in Wh-questions or with non-subject topics, and they tend to occur with a null or underspecified subject (e.g. a bare N subject), while finite expressions, those involving a verb with tense or agreement marking, generally occur with lexical subjects: either an overt pronoun or full DP subject (e.g. *he* or *the boy*) (Hoekstra, Hyams & Becker 1997, Clahsen et al. 1996). If RI utterances were simply finite clauses with a nonovert modal or auxiliary, this asymmetry in subject properties could not be accounted for.

Most relevant to our present discussion is that the NMH does not account for the fact that Dutch RIs carry a modal value while English bare V constructions do not. That is, it is not clear under this view why Dutch children, but not English children, should use null modal constructions.

2.2 Early Morphosyntactic Convergence

In contrast to the NMH, Hoekstra & Hyams (1998) propose that the modal reference of RIs comes from morphosyntactic properties of the infinitive itself. Although a full elaboration of this analysis would take us too far afield, the intuitive idea can be understood by considering the contrast between the Dutch sentence in (4a) and the English sentence in (4b).

(4) a. Ik zie Jan de straat oversteken.
        I see John the street cross-INF   (H&H 1998 (15))

(= I see John crossing the street)
  b. I see John cross the street.
(≠ I see John crossing the street)

According to Giorgi & Pianesi (1996), Dutch infinitives, which bear an infinitival -*en* suffix, are associated with a [-realized] feature, which makes the Dutch infinitive compatible with the expression of an ongoing or un-completed action. Thus, sentence (4a) can mean 'I see John crossing the street,' where the event of crossing in not completed. In this respect the infinitive contrasts with the English bare form (which has no infinitival mor-pheme), as it cannot appear in a similar structure. The sentence in (4b) can-not express an ongoing event, but only a habitual event. According to Gior-gi and Pianesi this is because the English bare form is inherently perfective; it denotes an entire event including its completion. True infinitives, on the other hand, are "prospective." The other Germanic languages, as well as the Romance languages, all of which have true infinitives, all work like Dutch in this respect.

H&H argue that this [-realized] feature is the basis for the modal inter-pretation associated with RIs. Because true infintives are inherently pro-spective, they do not refer to actual events, but to events that are not yet realized and hence they are interpreted as expressions of desire or necessity with respect to these eventualities.

Taking the morphosyntactically-based account of modal reference of Dutch RIs one step further, H&H provide an explanation for the other im-portant property of Dutch RIs discussed earlier, namely that they involve only eventive predicates. H&H observe that eventive verbs are associated with deontic modality, while stative verbs are associated with epistemic mo-dality. The distinction between the two types of modality is best illustrated with the modal *must* in (5).

(5) a. John must be French. (epistemic)
      b. John must leave.   (deontic)

A paraphrase of (5a) is "It must be the case that John is French", i.e. given what I know about John, it must be the case that he is French (hence the epistemic reading). A paraphrase of (5b) is "John has to leave", i.e. the necessity for John to leave is not contingent on our knowledge about John, but on some obligation (hence the deontic reading).

It is well known that children do not produce epistemic modality at this stage (Stephany 1986). In fact, experiments show that children often don't produce or comprehend epistemic modality until age 6 or so, long after the RI stage has passed. Since event-denoting predicates are associated with

deontic modality, and children at this stage have only deontic modality, it follows that they will produce only event-denoting predicates in modals contexts, such as RIs.

Thus, the EC follows from the MRE and the independent observation that children are restricted to deontic modality.

If the pattern of modal reference in Dutch RIs hinges on the overt infinitive marking on Dutch infinitives, then we can predict that other languages that show overt infinitival morphology (e.g. German) should pattern with Dutch. In the remainder of this paper, we will show that data from child German support H&H's account, and we will also discuss the model of RI modal reference proposed by Ingram & Thompson (1996).

3 German data

Adult German is like Dutch in that it shows infinitival morphology (like Dutch, an *-en* suffix, e.g. *schlaf-en* 'sleep', *trink-en* 'drink', *sprech-en* 'speak'). Thus, if H&H's analysis is correct, we should find the MRE and EC in RIs in child German, as we find them in child Dutch: RIs should allow a modal interpretation and RIs should be restricted to eventive verbs; stative verbs should always be finite.

The data in this study come from six children acquiring German monolingually. The ages of the children are given in Table 5.

child	age(s)	source
Julia	2;2-2;5	Clahsen 1986
Andreas	2;1	Wagner 1985
Wolfgang	2;5	Becker 1995
Johanna	2;5.5	"
Sophie	2;5	"
Philip	2;9	"

Table 5: German children in study and their ages:

Our results show that like children acquiring Dutch, the RIs of German children largely have a modal interpretation. That is, an utterance such as *Auch Teddy fenster gucken*, literally 'Also Teddy to look out the window', means 'Teddy must look out of the window' or 'I want Teddy to look out of the window.'

For the modal analysis we excluded Andreas' and Julia's data, because we found that the context provided in the transcripts was insufficient to determine unambiguously whether a particular RI utterance had modal reference or not. In fact, Poeppel & Wexler 1993 and Ingram & Thompson 1996

come up with very different rates of modal reference, both having analyzed Andreas' data. The data for three of the four children studied by Becker (1995), RIs were overwhelmingly used with a modal interpretation. Johanna had a lower rate, with just over half (57%) of her RIs containing a modal interpretation; Philip and Wolfgang had over 80% (81% and 87%, respectively); Sophie produced only a few RI utterances, but all of them had a modal interpretation.

Independently, we examined the modals used during this stage, and they were only used to express deontic modality, as has been found for other languages.

Given the MRE (and the independent observation that German children use only deontic modality), we expect that German children adhere to the EC. This is in fact correct. As in Dutch, only eventive verbs occur as RIs in child German. As we see in Table 6, with the exception of Johanna's data, there are virtually no nonfinite stative verbs in child German. Johanna's data may be problematic for independent reasons. For instance, she produces infinitive modals, which are generally unattested in child language.

child	eventive/stative V	finite verb	RI	overt modal
Julia	Eventive	25.5% (12)	100% (57)	(7)
	Stative	74.5% (35)	**0%** (0)	0
Andreas	Eventive	41% (94)	95% (192)	8
	Stative	59% (136)	**5%** (10)	1
Wolfgang	Eventive	66.7% (36)	100% (25)	3
	Stative	33% (18)	**0%** (0)	0
Johanna	Eventive	64% (9)	46% (6)	1
	Stative	36% (5)	**54%** (7)*	0
Philip	Eventive	64% (9)	100% (16)	0
	Stative	36% (5)	**0%** (0)	0
Sophie	Eventive	73% (19)	100% (5)	8
	Stative	27% (7)	**0%** (0)	0

Table 6: Stative vs. eventive verbs by clause type

4 Ingram & Thompson's associationist model

Before concluding, let us consider Ingram & Thompson's (1996) analysis of modal reference in children's RIs. According to their view, German-speaking children produce RIs with a modal interpretation because they form an association between the infinitive and modal meanings based on

input, such as (6), in which the infinitive either occurs with an overt modal or in a context where it is clear that the event of the verb is desired or impending. The exchange in (6) is cited in Ingram & Thompson (1996).

(6)   Mother: Ja, dann müssen wir es hier in den Mülleimer tun, ne?
                yes, then must-1pl we it here in the wastebasket du, no?
                "Yes, then we must put it in the wastebasket, no?"
      Katrin: Da daraus machen.
                there out   make-inf
      Father: Was machen?
                what make-inf
                "What must we do?"
      Katrin: Da daraus machen.
                there out make-inf
                "There we must take it out."

In fact, RIs do occur in adult German (and Dutch) in restricted contexts, and when they occur they also have a [-realized] aspectual value with modal meaning, for example the second exchange in (6). The fundamental difference between our account and I&T's is that we put the modal meaning in the grammatical representation of the RI, viz. in the infinitival morpheme. We are thus able to account for the MRE present in both child and adult RIs and absent in the English speaking child's bare forms. I&T's non-structural model, which attributes the MRE to the surface input, begs the question of why the adult German/Dutch RIs also have a modal value. It also fails to explain why the MRE is absent in early English since bare verbs also occur in modal contexts in adult English, e.g. John must/can sing.

We propose a principle of Early Morphosyntactic Convergence, which holds that children quickly converge on the morphosyntax of the respective adult languages. For Dutch and German children, this includes the learning of infinitival morphology, which universally carries modal value according to our hypothesis. English speaking children also quickly converge on the morphosyntax of English, including the fact that the English verb lacks infinitival morphology and hence (by our hypothesis) modal meaning. Ingram and Thompson's dictum 'what they hear is what you get' is true but only because children analyze what they hear according to the same general principles of grammar that constrain adult grammars.

5 Conclusion

To sum up, the preceding discussion lends support to Hoekstra & Hyams' (1998) account of the MRE and Eventivity Constraint in child Dutch. The

data discussed here show that German children's RIs pattern with Dutch RIs in the relevant respects: they adhere to the Eventivity Constraint, and they typically yield a modal interpretation. Both German and Dutch contrast with English (English RIs show neither the EC nor modal reference). These patterns can be linked to the fact that German and Dutch share the relevant morphosyntactic properties (viz. infinitive morphology and a [-realized] feature), again contrasting with English.

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