Is There an Analogue to the RI Stage in the Null Subject Languages?

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1.0 Introduction

Root infinitives, (RIs) illustrated in (1), are a robust phenomenon in some child languages (e.g. German (1) and Dutch (1b)).

(1) a. Enzo malen   (Leo 2;0)   b. Op kist zitten   (Josse 2;0)
        Enzo draw-IN   on box sit-INF
        'Enzo wants to draw'   'Sit on the box' (to mother)

But RIs are not universal. Various child languages do not show an RI stage, notably the Romance null subject languages. In this paper we will provide evidence from 3 monolingual Italian children and one bilingual Italian-German child that there is an analogue to the RI stage in the Romance null subject languages. We propose that the RI analogue is the imperative. We provide a unified structural account of the RI and RI analogues.

2.0 Root Infinitives (RI) and Bare perfectives (BP)

As a point of departure, we identify 3 important temporal properties of RIs: (i) RIs are tenseless verbs in root contexts; (ii) RIs typically have a modal or irrealis meaning expressing volition, intention, or direction with respect to some eventuality (cf. (1)); (iii) RIs are typically eventive.

Following Hoekstra & Hyams (H&H) (1998), we refer to property (ii) as the Modal Reference Effect (MRE) and property (iii) as the Eventivity Constraint (EC).[1] H&H (1998) argue that the EC is derived from the MRE (cf. also Ferdinand 1996) and that the modality of the infinitive is associated with the infinitival morpheme. It is therefore significant that similar effects show up in Greek, a language that has no infinitival form. Greek 2-year olds use a "bare perfective" (BP) form - a perfective verb that is not supported by either tense or modal morphology, which is ungrammatical in the adult language, as in (2).

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[1]The MRE and EC have been noted in several languages, e.g. Dutch (Wijnen 1996), German (Becker and Hyams 1999), Swedish: Plunkett and Strömqvist 1990), French (Ferdinand 1996). (See H&H 1998 for additional references).

(2) Ego katiti   (Spiros 1;9)
    I   sit-PERF- 3rd sing.
    'I am going to/want to sit'

Interestingly, the BP shares the temporal properties of RIs outlined above (cf. Varlokosta et al 1998; Hyams 2002, 2003): (i) The BP (-*i* form) is a non-finite, non-agreeing form;[2] (ii) the BP expresses the same irrealis meanings as the root infinitive; and (iii) the BP is typically eventive. A final observation is that RIs decrease over time as modals increase (cf. Wijnen 1994; Blom 2002) and the same trade-off occurs with the Greek bare perfective (cf. Hyams 2002).

The Dutch and Greek data are summarized in Tables 1 and 2. Table 1 shows the MRE in both languages and Table 2, the eventivity effect.[3]

Table 1. Proportion of RI/finite verbs (Dutch) and perfective/imperfective verbs (Greek) showing modal reference

Modal Reference Effect (MRE)			
Dutch (1;9-32)		*Greek (1;9-2;5)*	
Ris	Finite	Perfective	Imperfective
86%	3%	**78%**	4%
(1625/1883)	(21/694)	(212/274)	(5/127)

Table 2. Proportion of RI/finite verbs (Dutch) and perfective/imperfective verbs (Greek) that are eventive

EC(Eventivity Constraint)			
Dutch (1;9-32)		*Greek (1;9-2;5)*	
Ris	Finite	Perfective	Imperfective
95%	50%	**100%**	60%
(1790/1883)	(350/699)	(224/224)	(127/210)

The robustness of the RI and BP stages, and the strength of effects such as the MRE and the EC, suggest that there is some universal basis for the phenomenon. It thus behoves us to see if an RI analogue can also be found in the Romance languages that do not show an RI stage.

3.0 Imperatives in early Italian

We suggest that this analogue is the imperative. Prima facie, the imperative is a pausible candidate because it shares the essential RI properties: Imperatives are irrealis, that is, they express a direction to bring about a state of affairs that is

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[2] The rate of correct SVagreement with the BP is about 60%, comapred to the 87% agreement rate for 1st and 2nd person verbs. (Cf. Hyams 2002)

[3] The figures in Table 1 and Table 2 are adapted from Hyams 2002; based on Wijnen 1986; Stephany 1985 p.c.

unrealized at speech time; they are restricted to eventive predicates; and they are tenseless.

In what follows we first present some quantitative results that support this hypothesis. We then provide an account of the modal meaning (and eventivity) associated with the RI and its analogues as well as its morphological properties, especially the lack of finiteness. Finally, we explain the cross-linguistic differences, viz. why the RI languages choose an infinitive while the null subject languages choose the imperative. We will see that despite different non-finite forms, they have similar structural and licensing properties.

We adopt Han's (2001) description of the imperative as a form that is marked with an 'irrealis' feature that contributes an unrealized mood interpretation and a 'directive' feature encoding directive illocutionary force.

Although imperatives generally have the same morphological form as indicatives, they have a special syntax. Consider, for instance, the position of the clitics. In Italian, clitics immediately precede finite verbs in indicative mood, as in (3a), but they follow the imperative, as in (3b).

(3) a. la prendi b. Prendi-la!
   it_{cl}-take   take-it_{cl}
   'you take it' 'take it !'

Italian children begin using imperatives before age 2 in most cases, and the verbs have appropriate morphology[4]. Clitics are correctly positioned in both imperative and indicative sentences as illustrated in (4).

(4) a. dammi! (Diana 1;10) b. l'ha fatta (Diana 1:10)
   give-to me_{cl} it_{cl} has made
   'give it to me'   '(he/she) has made it'

Table 3 provides quantitative data from one child, Diana, showing the near perfect relation between the clitic position and the force of the verb.

Table 3. Enclitics and Proclitics in Diana (1;08-2;05)

	Verb-cl	cl-Verb
Imperatives	27	1
Indicatives	0	28

In contrast to RIs and BPs, imperatives are fully grammatical in adult language and so the simple appearance of imperatives in the child's language is not remarkable. If, however, the imperative in child null subject languages represents an RI analogue, we can expect it to have some distinguishing properties. Two possibilities suggest themselves, as in (5).

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[4] The children we studied had productive use of only the 2nd person singular imperative (e.g. *mangia* ! 'eat').

(5) <u>Predictions of the imperative analogue hypothesis (IAH)</u>
  (i) In null subject languages imperatives will occur significantly more often in child language than in adult language.
  (ii) In child language imperatives will occur significantly more often in null subject languages than in the RI languages.

The logic behind (5i) is that over time some imperatives will be replaced by modals, just as RIs and BPs trade off with modals in Dutch and Greek, respectively. A similar reasoning gives rise to (5ii): if RIs and imperatives both express irrealis mood, then RIs might bleed imperatives in the RI languages.

3.1. Data

To test the predictions in (5) we compared imperatives in child and adult Italian and we compared imperative and RI frequency in Italian and German child language, in both monolingual and bilingual development. Table 4 provides information about the children whose files we examined.

Table 4. Age and language of children

Child	Age-range	Language	Source
Francesco	1;5-1;8	Italian	from Childes, Roma corpus
Denis	1;5-2;2	Italian	from Leonini 2002
Martina	1;10-2;7	Italian	from Childes, Calambrone corpus
Diana	1;8-2;6	Italian	from Childes, Calambrone corpus
Viola	2;1- 2;7	Italian	from Childes,Calambrone corpus
Caroline	1;3-2;6	German	from Childes, Nijmegen corpus
Kerstin	2;0	German	from Childes, Nijmegen corpus
Simone	2;0-2;7	German	from Childes, Nijmegen corpus
Leo	2;0-2;7	Ita-Germ	from Berger-Morales & Salustri 2003

We also examined adult data from two sources: naturally occurring adult-directed language from several Italian adults engaged in informal discourse (transcripts provided by Sandro Duranti), as well as child-directed adult language taken from the adult tiers of two of the CHILDES transcripts we examined (diana5, diana1) and from Leo's data. Imperatives in the child and adult data were identified by the context of use, their morphology (where distinguishable) and syntax, in particular the position of clitics when they occurred.

3.2 Results

Turning now to our results. Our first prediction is that imperatives occur less frequently in adult language than in child language. Table 5 shows the rate of
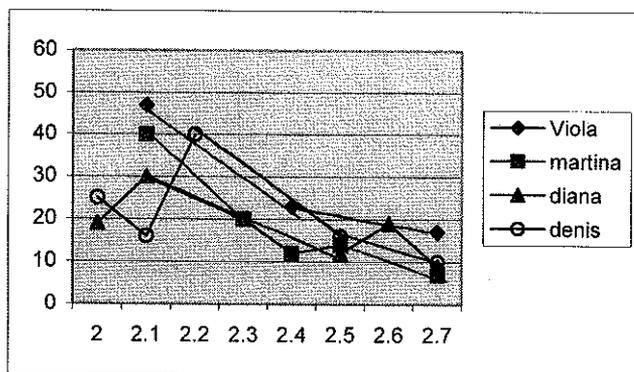
imperatives for adults in both adult-directed and child-directed language.[5]

Table 5. Frequency of imperatives in adult Italian (all forms)

	Imperatives		*Total verbs*
Discourse context	Tokens	%	
Adult-directed	36	**5.6**	950
Child-directed	82	**14.9**	550

As we might expect, imperatives are more frequent in child-directed language (15%) than in adult-directed language (5%). We use the higher child-directed rate as our adult norm.

Turning to the Italian child data, imperatives are used very early. Indeed, they are among the first verbal forms used. For example, from age 1;5 to 1;8 40% of Francesco's verbs are imperative. Similarly, Denis (1;5-1;8) produced 78% imperatives. However, there are few utterances overall at this stage and it is likely that many of the imperatives are rote forms, like *guarda!* (look). In Figure 1 we present the data of the older children (Viola, Martina, Diana, and Denis at a later stage). The proportion of imperative is still quite high as compared to 15% adult norm. The child rates peak at about 40% somewhere between the ages of 2;0 and 2;4 and then drop to adult-like levels by about age 2;6 or 2;7. Thus, as predicted, the rate of imperatives is considerably higher for children than for adults, even in child-directed language. Notice as an aside that despite the salience of imperatives in the input (e.g. special prosody, first position) (Newport, Gleitman & Gleitman 1972), the child frequencies do not at all mirror the adult frequencies, as would be predicted by statistical learning models. This will be clear in the German data as well.

Figure 1. Proportion of imperatives in 4 Italian children (ages 2;0 to 2;7)

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[5] This and subsequent frequencies are calculated the proportion of imperatives (or RIs) out of all verbal utterances.

The proportion of imperatives should be compared to the very low rate of RIs in the Italian children's data, as shown in table 6.

Table 6. Frequency of imperatives and RIs in early Italian

Child	Age	%RI (mean)	% Imp (mean)	Total verbs
Denis	2:0-2:7	2.8	31.1	318
Martina	2:1-2:7	0	17.5	513
Diana	2:0-2:7	0	16.4	863
Viola	2.1-2:7	0.2	30	198

We note, finally, that the "overuse" of imperatives happens at the same age as the RI stage in the RI languages (roughly between the ages of 2 and 2;6).

Let us now consider German. German imperatives have a similar morphosyntax to Italian imperatives. For the majority of verbs the imperative form is identical to the stem. The only overt morphological marking of the imperative in German is a stem vowel change, and this occurs with only a few verbs. As in Italian (and other languages), the German imperative has a special syntax. It raises to Force position, which we take to be high in the CP domain (Rizzi 1997). The German imperative is illustrated in (6).

(6) a. Iss den Apfel!   b. Komm bald nach Hause!
        'Eat the apple!'   come soon to home
                                   'Come home soon!'

Table 7 presents the frequency of imperatives in adult child-directed German. We see that this proportion is quite high, around 36%.

Table 7. Frequency of imperatives in adult German

Files (from CHILDES)	Imperatives	Total verbs
K2010613.cha	189	309
KE720905.cha	118	366
KE020005.cha	300	836
Total	538 (35.6%)	1511

It is therefore remarkable to observe that German-speaking children use imperatives very infrequently. Figure 2 presents the proportion of imperatives for 3 German-speaking children (Caroline, Kerstin and Simone). For the purposes of this analysis we counted as imperative, verbs (i.e. stems) that had clearly raised, as in (7).

(7) a. Mach auf!   b. Beiss mal   c. Trink Milch!
        Open *prefix*   Bite *particle*   Drink (the) milk

In (7a) the verb has raised across the prefix *auf;* in (7b) the verb across the particle *mal;* and in (7c) across the object. We did not count as imperative, stems that clearly had not raised to a higher position such as those in (8).

(8) a. Aufmach   b. Mal beiss   c. Milch trink

Single word utterances were counted when it was clear from context that they were imperative.[6]

   Figure 2 shows the frequency of imperatives for the German children between the ages of 1;6 and 2;7. We note first that as predicted, overall rate of imperatives is quite low as compared to German adults and as compared to Italian children. Also, the frequency of imperatives remains fairly constant at around 10% across all data points. We do not find the same peak during the first half of the 3rd year as we do for the Italian children.
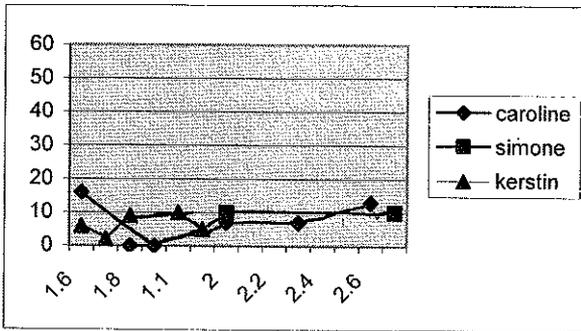
Figure 2. Proportion of imperatives in 3 German children (ages 1;6-2;7)

Thus, both the predictions in (5) are confirmed by the monolingual acquisition data, consistent with the hypothesis that the imperative is the RI analogue in languages such as Italian.

3.3. Bilingual Italian-German

   We also examined the frequency of imperatives and RIs in a bilingual German-Italian child, Leo. The bilingual child is the perfect controlled experiment. As shown in table 8, there are very few imperatives in Leo's German during the relevant period while between 34% and 56% of the verbs in his Italian corpus are imperative.

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[6] German has more potential for indeterminacy than Italian because the bare stem in one word utterances can be an infinitive lacking *-en*, an imperative, or a 1st person singular. Only one child shows a relatively high percentage of indeterminate forms. See Salustri & Hyams (forthcoming) for discussion.

Table 8. Proportion of imperatives (bilingual child)

Imperatives	German		Italian	
Stage	Tokens	%	Tokens	%
2:0-2:4	1/63	**1.5**	25/45	**55.5**
2:6-2:7	3/46	**6.5**	10/29	**34.4**

Figure 3 illustrates that Leo is also like the monolingual Italian-speaking children in showing a peak in imperatives at around age 2;3.[7]
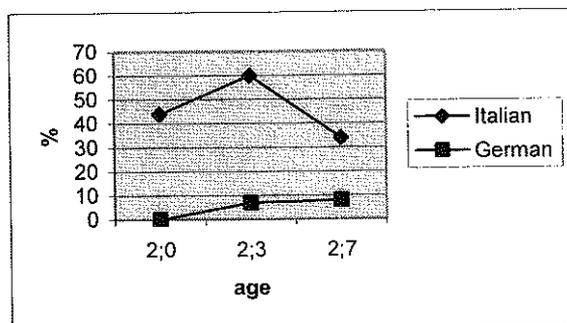
Figure 3. Imperatives in Bilingual data

Table 9 shows that Leo only uses RIs in German and the frequency is comparable to monolingual German speaking children.

Table 9. Proportion of Root Infinitives (bilingual child)

RI	German		Italian	
Stage	Tokens	%	Tokens	%
2:0-2:4	51/63	**81**	1/45	**2**
2:6-2:7	28/46	**61**	2/29	**7**

Thus, Leo perfectly mirrors the cross-linguistic differences that we observe in the monolinguals. His data also clearly support the hypothesis that bilingual children develop separate grammars for each language (Meisel 1990).

The data presented thus far are consistent with our hypothesis that the imperative is an RI analogue in the null subject languages. In child Italian imperatives express irrealis Mood and RIs do not occur. Why do we find this cross-linguistic difference? In what follows we outline a structural account of this variation that also captures the universal properties of the semantics-

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[7] For this analysis we did not include the files in which the total number of verbs is less than 10

morphosyntax mapping. (See Salustri & Hyams, forthcoming for a more detailed exposition.)

4.0 The structure of irrealis clauses in child language

We assume along with many others that the temporal, aspectual and modal interpretation of an event is determined by the functional structure of the clause. With respect to the RI/RI analogues, we assume that irrealis meaning is structurally represented by MoodP in a hierarchical arrangement as in (9).

(9)   ForceP
        /   \
    Force   MoodP
              /   \
          Mood   TP/AgrP
                   /   \
               T/Agr   AspP
                         /   \
                      Asp   VP
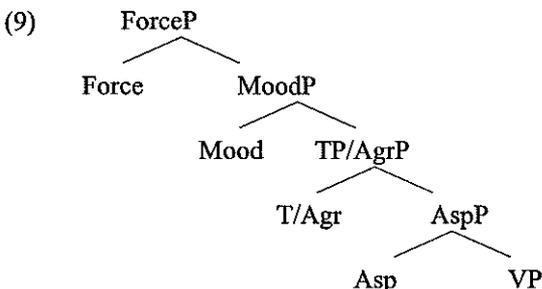
We further assume that functional heads have features that have to be checked, either through Merge or Attract (Chomsky 1995). Under Merge, a lexical element with appropriate features is inserted into the head position, for example a modal in Mood. Under Attract the functional head -- in this case Mood -- attracts an appropriate feature in the verb that percolates to VP. Attract requires that the functional category be in a local relation with the verb. The locality condition that we adopt is given in (10) (cf. Bobaljik and Thrainsson 1998).

(10)   Features are checked in all and only local relations to a head, viz. head-spec, head-complement, head-head (adjoined head).

In this analysis we focus on the head-complement relation. Hyams (2003) proposes that in RI languages Mood is checked against an irrealis feature in the infinitival verb. It follows from the locality condition in (10) that there can be no head intervening between Mood and the verb. This is accomplished though the underspecification (by which we mean elimination) of the intermediate I projections.[8] The relevant structure is given in (11).

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[8] In the case of the Greek BP it is the perfective feature in the verb that licenses Mood and hence in this case as well, locality requires that TP/AgrP and AspP be eliminated. Hyams argues that perfectivity and deontic modality both involve a polar transition (cf. Barbiers 1996). The 'transition' feature in the perfective verb thus matches and licenses the (deontic) Mood projection. See Hyams (2003) for justification and further details.

(11)
$$C/MoodP$$

Mood *-checking-* VP

V
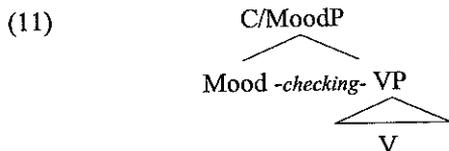
According to our analysis, the non-finiteness of RIs (and the BP, cf note 8) follows as a direct structural consequence of the licensing of Mood, and we thus derive the MRE, that is, the association between non-finiteness and modality that we find in the early grammar. [9]

Returning now to the contrast between Italian and German, we have two complementary questions: First, why does the imperative, but not the RI license (irrealis) Mood in Italian, or more to the point, why is there no RI stage in Italian? And conversely, why does the infinitive, rather than the true imperative show up in irrealis contexts in German?

Following ideas of Guasti (1992) and Rizzi (1994) (based on Belletti 1990), we propose that RIs are blocked in Italian because Italian infinitives have Agr features that must be checked. AgrP/TP cannot therefore be eliminated in Italian, no local relation between Mood and the verb is established, and hence no RI stage. The imperative, by contrast, has an irrealis feature (Cf. Han 2001), but no temporal (tense, aspect) features. Moreover, Italian children use only 2nd person singular imperatives (cf. note 4), and thus early imperatives are arguably unspecified for agreement as well. Intermediate heads may be eliminated and the irrealis feature in the imperative verb checks Mood. Subsequent movement of the verb to Mood allows the 'directive' feature to be in a local checking relation with Force, as schematized in (12).

(12)
$$...C/ForceP$$

Force *-checking-* VP

V

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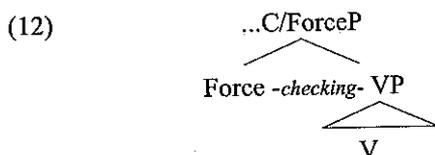
[9] The eventivity constraint (EC) (cf. section 2) also follows: Since deontic modality (like perfectivity) involves a polar transition, it is essentially incompatible with stative predicates. The most natural reading of *Mary must know the truth* is epistemic (viz. in light of the available evidence it must be the case that Mary knows the truth) or an inchoative, i.e. eventive, reading (viz. it is necessary that Mary be told/come to know the truth), while the most natural reading of *Mary must read this book* is deontic (viz. it is required/necessary that Mary read the book). See Barbiers 1996; Hoekstra & Hyams 1998; for further discussion of this issue.

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In contrast to Italian, German infinitives do not have Agr features to be checked. AgrP/TP (and AspP) can be eliminated, bringing the infinitive into a local licensing relation with Mood (cf. 11). RIs are therefore possible. Adult German does have a true imperative (cf. (6) and table 7). So, why do young German children eschew the imperative in favor of the infinitive? To answer this question we appeal to economy considerations. We make the standard assumption that movement occurs solely for the purposes of feature checking and only as a last resort. Since locality can be satisfied by underspecification, that is the more economical option. Thus all else being equal, RIs will win out over imperatives as an expression of irrealis Mood.[10]

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[10] Of course in Italian all else is not equal since infinitives must check AGR features. Thus, economy principles operate within the constraints of grammar.

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