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The Question of Root Infinitives in Early Child Greek

Spyridoula Varlokosta, University of Pennsylvania
Anne Vainikka, University of Pennsylvania
Bernhard Rohrbacher, Brown University

University of Pennsylvania
3401 Walnut Street, Suite 400A
Philadelphia, PA 19104-6228

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1 Background

It is well known that children acquiring Germanic and Romance languages go through an early stage at which they produce declarative sentences with a Root Infinitive (cf. (1)) which would be ungrammatical in the adult language (Stern & Stern 1928, Weverink 1989, Pierce 1992, Wexler 1994). For languages outside of these language families, little work has been done on such Root Infinitives. In the present paper we investigate the status of Root Infinitives in Modern Greek, a language which lacks an infinitive form altogether.

1a) Mina einer gucken.	(*German:* Sabrina 1;11)
Mina one look-INF	(Clahsen, Penke & Parodi 1993/4)
b) Gubbe vara dar.	(*Swedish:* Markus 1;10)
old.man be-INF there	(Platzack 1994)
c) Moi dessiner la mer.	(*French:* Daniel 1;10)
me draw-INF the sea	(Pierce 1992)
d) Quetto qui mangiare chellini.	(*Italian:* Martina 1;11)
this here eat-INF piglets	(Guasti 1993/4)

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Table 1 summarizes the rates of Root Infinitive use for some of the youngest children discussed in the literature (cf. also Guasti 1993/4, Table 4 and Sano & Hyams 1994, Table 10). Root Infinitives are produced over 90% of the time by the Dutch child Peter, the Swedish child Markus and the French child Nathalie, in their earliest recordings. Peter and Markus in their later files resemble the pattern of the presumably more advanced French children Gregoire and Philippe. The French child Daniel and the two German children fall in between these two groups in terms of their production of Root Infinitives.

Table 1. Proportion of Root Infinitives (RI).

Language	Child	Age	Proportion of RI	Source
German	Katrin	1;5	58%	R & V 1994[*]
	Nicole	1;8	68%	
Dutch	Peter I	1;9-1;11	94%	Wijnen 1994
	Peter II	2;0-2;2	34%	
Swedish	Markus I	1;7-1;9	100%	R & V 1994[*]
	Markus II	1;9-1;11	82%	
	Markus III	1;11	45%	
French	Daniel	1;8	60%	Pierce 1992
	Gregoire	1;9	30%	
	Nathalie	1;9	96%	
	Philippe	2;1	21%	

[*] Rohrbacher & Vainikka (1994)

To account for the Root Infinitive phenomenon, Boser, Lust, Santelmann & Whitman (1992) made an early proposal that Root Infinitives are adult-like finite sentences apart from containing a null auxiliary or modal. Wexler (1994) showed, based on a survey of the phenomenon across languages, that very young children know that finite verbs raise and non-finite verbs do not raise (cf. also Pierce 1989; Poeppel & Wexler 1993; Rohrbacher & Vainikka 1994). What the young children do not know is that a non-finite verb cannot occur as a main verb; Wexler suggested that this may be due to children's insensitivity to tense distinctions at the relevant point in development. Rizzi (1993/4), on the other hand, proposed that the option of non-raising is due to the possibility of positing a truncated tree lacking the TP (and the CP) projection. That is, the structure of the Root Infinitive construction involves a reduced tree; what children at this point fail to know is that a finite clause must contain a full CP projection.

Our goal in this paper is to determine whether there is an equivalent Root Infinitive stage for children acquiring a language which does not have an infinitive construction, namely Modern Greek. We find that in the typical Root

Infinitive contexts Greek children use a verb form involving the suffix -*i*, which corresponds to the 3rd person singular suffix, as well as the participle. We argue that the data are best explained by treating the -*i* form as the participle, thus suggesting that the relevant verb form need not be an infinitive. Under Rizzi's approach, we would in fact expect various non-finite verb forms to be attested in the main clauses of the youngest speakers of various languages.

2 Adult Greek

In this section we will review some aspects of Adult Greek which will be relevant to the discussion following.

2.1 The *na*-construction

In modal and other embedded contexts where languages such as English use an infinitive, Greek makes use of a verb form introduced by the particle *na* and inflected for subject-verb agreement and aspect, as exemplified in (2). This construction is traditionally referred to as the subjunctive, but throughout this paper we will refer to it as the *na*-clause. The particle *na* has typically been analyzed as a modal element (Ingria 1981, Philippaki-Warburton & Veloudis 1984, Terzi 1992, among others); in fact, this view is supported by the acquisition data we discuss below. Alternatively, *na* has been treated as a complementizer in some traditional grammars (e.g. Andriotis 1934), as well as in Agouraki 1991 and Tsoulas 1993.

2a) Boro na dhiavaso to vivlio.
can-1SG NA read-SUBJ/PERF-1SG the book
'I can read the book'

b) Thelo na diavasi i Maria to vivlio.
want-1SG NA read-PERF-3SG the Maria-NOM the book
'I want Maria to read the book'

In addition to the embedded context, the *na*-construction can also appear as a main clause in adult Greek (with an optative or polite imperative reading). Due to its infinitive-like distribution, the *na*-construction is an obvious candidate for the equivalent of the Root Infinitive in child Greek. However, we will show below that the distribution of *na*-clauses in child Greek clearly differs from the distribution of Root Infinitives in other languages.

2.2 Subject-verb agreement

Greek regular verbs fall into two conjugation classes depending on whether the final syllable of the Present Tense is stressed or not. The agreement paradigm

for the more common conjugation (the one mainly attested in the child Greek data), with an unstressed final syllable, is provided in Table 2.

Table 2. The Greek agreement paradigm
(present and future tense and *na*-clauses)

	singular	plural
1st	*-o*	*-ome/ume*
2nd	*-is*	*-ete*
3rd	*-i*	*-un*

2.3 Aspect and Tense

Greek is a language that makes an aspectual distinction between Perfective and Imperfective Aspect. The aspectual distinction shows up in the Past Tense (Imperfect vs. Aorist), in the Future Tense (Imperfective Future vs. Perfective Future), and in the *na*-construction (Imperfective vs. Perfective *na*-clauses).

In the Present Tense there is no aspectual distinction, that is, the Present Tense always uses the Imperfective stem. Table 3 illustrates the interaction of aspect and tense in Adult Greek.

Table 3. The interaction of aspect and tense in Adult Greek (for the verb 'play' with the imperfective stem *pez-* and the perfective stem *peks-*).

	imperfective	*perfective*
Present	*pez-o* 'I play'	n.a.
Past	*e-pez-a* 'I was playing' (Imperfect)	*e-peks-a* 'I played' (Aorist)
Future	*tha pez-o* 'I will be playing'	*tha peks-o* 'I will play'
na-clause	*na pez-o*	*na peks-o*

Thus, the imperfective form *pezo* is used in the *na-* construction and in the future construction, as well as being the present tense imperfective form. Similarly, the perfective form *pekso* is used both in the *na*-construction and in future tense. (In addition, the perfective form is used in conditional and temporal adjunct contexts.)

The compound tenses in Greek are formed using the verb *exo* 'have' and the active participle,[1] as shown in Table 4.

[1] In traditional grammars this form has been referred to as the infinitive. However, it

Table 4. The Perfect Tenses in Adult Greek.

Present Perfect	*exo peks-i* 'I have played'
Past Perfect	*ixa peks-i* 'I had played'
Future Perfect	*tha exo peks-i* 'I will have played'

In the compound tense construction, the auxiliary agrees with the subject, while the participle always occurs with the non-agreeing suffix *-i*. The participle is formed using the perfective stem, and is homophonous with the 3rd singular perfective non-past form. This will turn out to be relevant for the analysis of Greek children's earliest verb forms.

3 The *na*-construction in Child Greek

The naturalistic data we have analyzed come from the Stephany Corpus of the CHILDES database (MacWhinney & Snow 1985; Stephany 1995). Stephany collected data from four children, three of which we have concentrated on, ranging from age 1;9 to 2;5. The recordings from the fourth child show that she is generally too advanced for our purposes, being the oldest of the four. For the remaining three children, two recordings were made with Spiros (age 1;9), four with Janna (starting at age 1;11), and 14 with Mairi (starting at age 1;9).

3.1 Distribution of *na* in child Greek

Based on our inspection of the earliest recordings, it appears that the *na*-construction is acquired early, around age 2, thus making it at first glance a plausible candidate for the Root Infinitive. Furthermore, in the earliest child data *na*-clauses typically appear as main clauses, unlike in the adult language, again a pattern similar to Root Infinitives.

However, in the earliest files of the two youngest children (Spiros at 1;9 and Janna at 1;11) the particle *na* is *missing* in the majority of cases, as exemplified in (3); cf. also Katis (1984) according to whom the earliest stage of Child Greek contains no particles. Janna at age 1;11 produced just one instance of an overt *na* (out of a total of 88 sentences with verbs - excluding the copula), and Spiros produced 10 phonologically reduced *na*-particles (of a total of 127 sentences with verbs).

has the distribution of the participle in other Indo-European languages in that it is used to form compound tenses. It differs from the Indo-European infinitive in failing to occur in the modal and other embedded (control) contexts. Thus, although this form developed from the Classical Greek infinitive, it no longer bears infinitival function.

3) *ULL:* to magnitofono.
the tape.recorder
JAN: valume mesa.
put-1PL inside 'Let's put (it) inside' (Janna 1;11 file 2)

In the later recordings of Janna (at age 2;5) and in Mairi's recordings from the beginning (from age 1;9 on), the *na*-construction with an overt particle is very frequent, as exemplified in (4) (later recordings are not available from Spiros). Mairi in her first file (age 1;9) produced 23 instances of *na*, out of a total of 133 sentences with verbs - excluding the copula and modals - whereas Janna produced in one recording (file 3, age 2;5) 42 instances of *na*-clauses (out of 178), the majority of which were root clauses.

4) ULL: ti tha kanume?
what FUT do-1PL
'What shall we do?'
JAN: na su litso alo.
NA you-GEN throw-PERF-1SG other
'(Let me?) throw you another (one)' (Janna 2;5 file 3)

Thus, two stages are observable in the usage of *na*: an early stage (represented by Spiros' data and Janna's early data at age 1;11) where the *na* particle is apparently not productively used, and a later stage (Janna's later data at age 2;5 and Mairi's data) where *na* is productively used in (non-adult) matrix clause constructions.

Interestingly, these two stages appear to correlate with the general development of IP-related elements. Given that the *na*-construction has been treated as a modal construction, this is not surprising. Thus, as we shall see in more detail below, Spiros and Janna in her early recordings do not reveal any evidence for having acquired tense marking, modals, or the agreement paradigm. On the other hand, Janna in her later recording (age 2;5) produces some modals and has a clearly productive Future Tense (with 19 instances) and Past Tense (with over 20 instances), as well as productive agreement. Mairi's earliest collected data represent a similar stage, given that she produces *na*-clauses, the Future Tense, productive agreement, and modals from her first recording on.

3.2 Arguments against the *na*-construction as Root Infinitive

Although the *na*-construction at first glance appeared to be a good candidate for the Root Infinitive, more detailed examination reveals a number of differences between Root Infinitives in other languages and the *na*-construction in early Child Greek.

First of all, the *na*-clause does not mark the earliest attested sentence type, unlike Root Infinitives, as suggested by the presence of an early stage where *na* is not yet productively used. Furthermore, given the relatively late emergence of the *na* particle, the proportion of *na*-clauses (with an overt *na*) in the early data is much lower than the proportion of Root Infinitives in the early stages of the languages described in Table 1. Spiros and Janna (at 1;11) produce *na*-clauses less than 10% of the time, and even Mairi at 1;9 (whose data we take to represent a later stage) only produces the *na*-construction 15% of the time. In contrast, the Germanic children of the same age represented in Table 1 produce Root Infinitives more than half the time.

Finally, the emergence of the *na* particle at the same time as the Future Tense, agreement, and modals suggests that *na*-clauses reflect a more advanced stage than the Root Infinitive stage.

Thus, we propose that the status of *na* is the same in child Greek as in adult Greek, namely it is a modal-like INFL-element. The *na*-construction is acquired along with INFL-related elements, whereas the reverse situation holds for Root Infinitives, which tend to be *reduced* in connection with the mastery of INFL-elements (cf. Clahsen 1991, Clahsen & Penke 1992, Duffield 1993). An intriguing question remains of why Greek children at our second stage use the *na*- construction as a matrix clause, contrary to the adult language.[2]

4 The distribution of the *i*-suffix in Child Greek

4.1 The overuse of the *i*-form

Inspection of the early data reveals that there is a verb form that is overused, namely the one marked with the suffix -*i*. The overuse of this form has also been observed in traditional work by Katis (1981; 1984; 1985) and Stephany (1981; 1995), as well as in Tsimpli (1992).[3] In the literature the -*i* form has been referred to as the 3rd singular person. Recall, however, that this form is ambiguous between the 3sg. form of the verb in the most common conjugation (cf. Table 2) and the (active) participle (cf. Table 4).

In the earliest recordings, the three children we have examined use the -*i* form even in sentences where the subject is clearly not 3sg., as witnessed in the examples in (5):

[2]Under Rizzi's truncated tree approach which we adopt in this paper, the matrix *na*-clauses can be analyzed as truncated IPs with a lacking or underspecified CP, consistent with the general lack of embedded structures at this stage in the acquisition data.

[3]Stephany's corpus is the same one we are using, whereas Katis's observation is based on data from different children. Most of Tsimpli's data come from the Stephany corpus also.

5a) SPI: tuto seli
this want-IMPERF-3SG 'I want this' (lit. 'He wants this')
ULL: afto thelis?
this want-IMPERF-2SG 'Do you want this?'
SPI: afto – seli.
this want-IMPERF-3SG 'I want this' (lit. 'He wants this')
(Spiros 1;9 file 1)

b) MOT: ti tha fas, aghapi mu?
what will eat-PERF-2SG love my
'What will you eat, my love?'
MAI: fai.
eat-PERF-3SG 'I (will) eat' (lit. 'She eats')
MOT: ti Tha fai?
what will eat-PERF-3SG 'What will she eat?'
MAI: karabe.
(type of pastry; kurabje) 'Pastry' (Mairi 1;9 file 1)

c) ULL: etsi?
like-this 'Like this?'
JAN: nitsi tola!
open-PERF-3SG now
'(you) open (it) now!' (lit. 'She opens it now')
JAN: anitsi!
open-PERF-3SG 'Open (it)!' (lit. 'She opens')
ULL: nitsi?
open-PERF-3SG 'Open (it)?' (lit. 'She opens?')
JAN: ne.
yes 'Yes.' (Janna 1;11 file 2)

The first two examples show use of the 3sg. instead of a 1sg. subject and the third example shows use of the 3sg. instead of 2sg. Example (5c) is comparable to the adult Greek usage of the subjunctive as an imperative. However, in the adult language a 2sg. verb form would be required, rather than Janna's 3sg.

Such overuse makes the *i*-form a plausible candidate for the role of Root Infinitive. In fact, we will argue in this paper that Greek children's earliest verb forms with the suffix -*i* correspond to the participle.

4.2 The two stages of the *i*-form

The developmental data from the three children reveals that there are two distinct stages in the use of the -*i* form in Early Child Greek. The characteristics of these two stages are summarized in tables 4, 5, and 6.

During Stage I, which corresponds to the speech of Spiros at 1;9 and Janna at 1;11, the *i*-form is used over half the time (Table 5). Compare this with the use of Root Infinitives by children acquiring other languages, as shown in Table 1. Moreover, a large proportion – about 40% – of *i*-forms is used in non-3sg. contexts, as shown in Table 6. Contrast this pattern with German or Italian where the 3sg. is *not* overused, although it is the first finite form acquired by children (Clahsen & Penke 1992, Meisel 1994, Pizzuto & Caselli 1994). Furthermore, non-3sg. verb forms are very rare and not overgeneralized (Table 7). For example, Spiros only produced 4 instances of a 1sg. verb form (all of them in 1sg. contexts). Rather similarly, Janna – for whom we have longitudinal data – produced 1sg. verb forms only 9% of the time at Stage I, as opposed to 33% of the time at Stage II (calculated on the basis of Tables 5 and 7). Given the low proportion of non-3sg. forms there is little evidence for the Agreement paradigm in this stage. Finally, there is no evidence for Tense or Modals.

During Stage II, on the other hand, which corresponds to the speech of Janna at 2;5 and Mairi at 1;9, we observe a completely different pattern with respect to the distribution of the *i*-form. Thus, *i*-forms are used much less than at Stage I, as shown in Table 5, and most of them are used appropriately in 3sg. contexts (Table 6). Moreover, the Agreement paradigm is used productively as indicated by the high proportion of the 1sg., 2sg., and 1pl. verb forms in Table 7. In addition, the Future Tense has clearly been acquired and some modals are attested.

Table 5. Distribution of the *i*-form in sentences with verbs. (excluding the copula and modals)

	Spiros 1;9	Janna 1;11	Janna 2;5	Mairi 1;9
	Stage I	Stage I	Stage II	Stage II
i-form	96 (76%)	45 (51%)	62 (35%)	50 (38%)
other	31 (24%)	43 (49%)	116 (65%)	83 (62%)
TOTAL	127	88	178	133

Table 6. Proportion of correct vs. incorrect uses of the *i*-form (excluding the copula and modals)

	Spiros 1;9	Janna 1;11	Janna 2;5	Mairi 1;9
	Stage I	Stage I	Stage II	Stage II
i-form in 3sg. context	58 (60%)	28 (62%)	62 (100%)	35 (70%)
i-form in other contexts	38 (40%)	17 (38%)	0 (0%)	15 (30%)
TOTAL	96	45	62	50

Table 7. The distribution of the non-3sg. verb forms (excluding the copula, modals and imperatives).

	1SG		2SG		1PL		2PL		3PL	
	corr.	inc.	corr.	inc.	corr.	inc.	corr.	inc.	corr.	inc.
Spiros, Stage I	4	0	2	1	5	1	0	0	4	1
Janna, Stage I	7	1	0	0	11	0	0	0	3	1
Janna, Stage II	58	0	20	0	19	0	2	0	6	1
Mairi, Stage II	29	0	8	0	19	0	0	0	1	0

The following summarizes the two stages:

- Stage I (Spiros 1;9, Janna 1;11):
  1. The *i*-form used over half the time (Table 5)
  2. A large proportion of *i*-forms used in non-3sg.contexts (Table 6)
  3. Non-3sg. verb forms very rare and not overgeneralized (Table 7); thus there is little evidence for the Agreement paradigm
  4. No evidence for Tense or Modals
- Stage II (Janna 2;5, Mairi 1;9):
  1. *i*-forms used much less than at Stage I (Table 5)
  2. most *i*-forms used appropriately in 3sg. contexts (Table 6)
  3. the Agreement paradigm used productively (Table 7)
  4. Future Tense and Modals have been acquired

5 Arguments for the *i*-form as the Early Non-finite form

5.1 Evidence for non-finiteness

5.1.1 Incompatibility with finiteness

As we have just seen, at Stage II the *i*-form is rarely overgeneralized to non-3sg. contexts; rather it appears to be appropriately used as the 3sg. Agreement marker. We take this to indicate that Stage I – where the *i*-form is frequently overgeneralized – represents the *Early Non-finite Stage* (i.e. the 'Root Infinitive' Stage), whereas Stage II corresponds to a stage where INFL-related functional projections are typically realized.

On the other hand, if the overgeneralized *i*-form were a *finite* form, we would expect it to emerge along with other finite forms such as Modals and verbs with productive Tense and Agreement morphology. In fact, the distribution of the overgeneralized *i*-form is in a sense the *reverse* of the finite verb forms: it is used at Stage I and practically disappears at Stage II. The frequency of the *i*-form at the earliest observed stage and its decline at later stages is comparable to the pattern of Root Infinitives observed in other languages.

5.1.2 Null subjects

Another piece of evidence in favor of the non-finiteness of the *i*-forms comes from the distribution of empty and overt subjects in child Greek. The emergence of overt subjects in child languages has been claimed to be associated with the acquisition of Agreement, even in Null Subject languages such as Spanish or Modern Greek (Grinstead 1994 for Spanish and Catalan; cf. also Krämer 1993 for Flemish, Dutch, and German). This suggests that overt subjects are licensed by a functional projection.

In Spiros's data the overgeneralized *i*-form mostly occurs with an empty subject (cf. also Tsimpli 1992 on null subjects with agreement errors). Overt subjects are predominantly used with correct Agreement, as shown in Table 8 (20 out of 25, i.e. 80%). Thus an overt subject implies correct Agreement while incorrect Agreement implies an empty subject. Since subject distribution depends on the presence vs. absence of correct Agreement, this argues for two different sentence types. Given the Romance data, there is reason to treat the predominantly null subject sentence type as an earlier developmental structure, associated with non-overt realization (or non-realization) of functional projections. On the other hand, the sentences with correct Agreement and an overt subject would involve the overt realization of functional projections.

Table 8. The distribution of subjects with 3sg. verbs (the *i*-form) (Spiros 1;9, files 1-2)

	Null subjects	Overt subjects	TOTAL
Correct	38 (66%)	20 (34%)	58
Incorrect	32 (86%)	5 (14%)	37
TOTAL	70 (74%)	25 (26%)	95

The idea that the earliest stage correlates with the absence of overt subjects (and no Agreement) is further supported by Janna's data, as shown in Table 9. We see that 42 out of Janna's 46 subjects are null, i.e 91%).

Table 9. The distribution of Janna's subjects with 3sg. verbs (the *i*-form)

	Null subjects	Overt subjects	TOTAL
Stage I (1;11)	42 (91%)	4 (9%)	46
Stage II (2;5)	43 (73%)	16 (27%)	59

Since the overgeneralized *i*-form rarely occurs with an overt subject, contrary to the situation with finite verbs, this provides another argument for treating the *i*-form as an Early Non-finite form comparable to the Root Infinitive in other languages.

5.1.3 Verb Raising

More evidence for treating the *i*-form as an Early Non-finite form in Child Greek could potentially come from various diagnostics for Verb Raising, such as adverb placement, position of Negation, and word order.

In the Early Greek data there are few temporal adverbs. Moreover, they occur either preverbally or postverbally and thus do not provide conclusive evidence about Verb Raising. Furthermore, given that there are several options for temporal adverb placement in Adult Greek (Alexiadou 1994, pp. 130-133), the adverb data are not obviously relevant for determining Verb Raising in Greek. Similarly, Negation in Adult Greek is not a diagnostic for Verb Raising because Negation precedes all verbal forms in the sentence.

The position of the Subject is potentially revealing: the majority of children's early overt subjects are postverbal (about 75%; Tsimpli 1992). However, since postverbal subjects might be generated postverbally, the strongest evidence for Verb Raising would come from VSO orders. In fact, it turns out that at Stage I this order is not attested (cf. also Tsimpli 1992); all postverbal subjects occur in VS sentences. However, if the subject is generated in a *preverbal* SPEC VP position, as it is reasonable to assume, the VS orders do provide evidence for raising to some functional projection at Stage I. Given the evidence from null subjects and incompatibility with finiteness, we assume

that this projection is low in the tree, presumably Aspect Phrase (see Section 6 below).

5.2 Evidence for the Participle analysis: The Perfective stem

Up to this point, we have seen arguments that the overgeneralized *i*-form is a non-finite form (i.e. it doesn't raise as high as finite verbs). We will now turn to evidence favoring the *participial* nature of this non-finite verb.

An unexpected pattern is attested in our data: the overuse of the *i*-form is more prominent with the Perfective stem than with the Imperfective stem, as shown in Table 10. Thus, more than half of the Perfective *i*-forms involve incorrect uses of the *i*-suffix. Interestingly, although there are some incorrect uses of the *i*-form with the Imperfective stem as well (about 1/5 of the relevant sentences), it turns out that almost all of them (14 out of 16) involve verbs that *lack* a Perfective stem (i.e. verbs like *kani* 'do' for which the stem *kan-* is used everywhere).

Table 10. The distribution of the *i*-form with different stems (Spiros and Janna, Stage I).

	Imperfective		Perfective	
	correct agr.	incorrect agr.	correct agr.	incorrect agr.
Spiros	35 (78%)	10 (22%)	24 (47%)	27 (53%)
Janna	29 (83%)	6 (17%)	6 (35%)	11 (65%)

The usage of the Perfective stem is especially surprising given that the *Imperfective* stem is considered to be the unmarked stem in Adult Greek (cf. Philippaki-Warburton 1973) due to the fact that it is the only stem possible in the Present Tense (cf. Table 3). A straightforward explanation for the usage of the Perfective stem is that the relevant non-finite form is in fact the *participle*, which in Adult Greek requires the Perfective stem and moreover does not agree with the subject.

An analysis of the *i* suffix as the participle has advantages over the traditional analysis of the *i*-form as a finite 3rd singular form. Under the traditional analysis, the correlation between the Perfective stem and the overgeneralized *i*-form would remain unaccounted for, along with the non-finite properties of this form. If this form were a finite 3rd singular form, we would not expect it to cooccur more with the Perfective stem rather than the Imperfective form.

Furthermore, the analysis of the *i*-form as the active participle is attractive because it makes the child Greek data more comparable to the Root Infinitives in other languages, which also involve a non-finite verb form (cf. Sano & Hyams 1994 for English).

6 Discussion

Let us now consider the ramifications of our findings for the various analyses proposed in the literature for the "Root Infinitive" phenomenon.

At first glance, the null auxiliary analysis of Boser et al. (1992) seems to explain the occurrence of the participle form, since children's non-finite clauses are similar in form to the adult compound tense construction apart from the lacking auxiliary (*exo* 'have). However, this analysis predicts that the participle is used in similar *contexts* as in Adult Greek, namely in the Perfect Tense (cf. Table 4). This prediction clearly does not hold since the non-finite form is used by children in a wide variety of contexts, most of them incompatible with the adult Perfect context.

A further problem with the null auxiliary analysis is that it fails to unify the various non-finite forms attested in early child languages. Under this approach one would be forced to assume that there is parametric variation between child languages in terms of whether an auxiliary or a modal is omitted. Note that a null modal analysis is not possible for Child Greek, since modals do not select a participle.[4] In addition, given the Greek data, the theory would be considerably weakened by the fact that the semantics of the child construction need not be related to the corresponding adult construction.

According to a recent proposal by Hoekstra & Hyams (1995), the underspecification of Number Phrase is responsible for several phenomena in child grammars, including Root Infinitives, the distribution of null subjects, and omission of determiners. Under this approach, Root Infinitives are only found in languages with impoverished person agreement. In a language with rich agreement, such as Italian, Root Infinitives are not expected.[5] Modern Greek also has rich agreement according to their definition, and – rather than Root Infinitives – Child Greek is expected to demonstrate rich person agreement from the earliest stages on. Although it is technically true that Root Infinitives are not found in Child Greek (since the language has no infinitive form), we did not find evidence in the production data for the expected early person

[4] A further potential diagnostic for distinguishing the participle analysis from the null modal analysis comes from the distribution of the two sentential negators, *mi(n)* which is used in modal contexts and *dhen* which is used elsewhere. The early acquisition data contain too few examples to be able to conclusively determine the form of the Negation. However, Tsimpli (1992) reports an example which seems to support the participial analysis over the modal analysis (Alexia 1;11): *ze fiji, mama* [NEG (dhen) leave-PERF-3SG, mommy] 'Don't leave, mommy'.

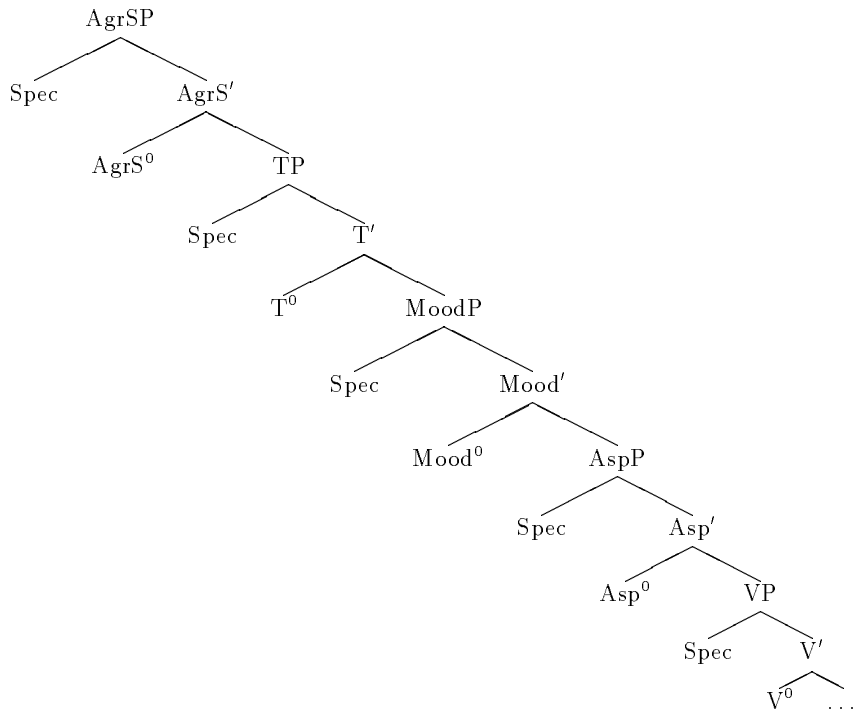
[5] Guasti (1993/4) has reported that the rate of Root Infinitives in early Italian is lower than in the languages represented in Table 1. However, as Guasti points out (footnote 7), this may be due to the omission of participles from her calculations. Given the Greek data and the analysis proposed here, if the use of participial forms in early languages represents the "Root Infinitive Stage", as well, then the Italian pattern reported by Guasti may be only an epiphenomenon.

agreement; rather, the ungrammatical *i*-form is used in various contexts. If anything, number agreement may emerge *earlier* than person agreement, given that the second agreement affix (after the 3rd singular) acquired appears to be the 1st plural affix (cf. Table 7). On the other hand, if the participle in Child Greek corresponds to the Root Infinitive attested in other languages – as we claim – then Child Greek *does* have "Root Infinitives", contra Hoekstra & Hyams's prediction. Thus, the underspecification of Number Phrase does not seem to be able to explain the Early Non-finite Clauses in Greek.

A more promising approach crosslinguistically is that of Rizzi (1993/4), according to whom the relevant form is "a root construction exhibiting whatever unmarked non-finite form the language possesses" (p. 379). Within Rizzi's approach, the participle analysis suggests that young children initially prefer the morphologically least marked wellformed item of the verbal paradigm. In languages like English or French, this item is the infinitive, not marked for agreement, tense, mood or aspect. In languages such as Greek, this item is the participle, marked only for aspect but not for agreement, tense or mood. Note that the relevant notion of markedness involves abstract features, not overt markers, since in Greek the perfective participle (bearing only an abstract aspect feature) is homophonous with the 3rd singular perfective (bearing abstract agreement and aspect features).

Both Wexler (1994) and Rizzi (1993/4) have proposed that Root Infinitives reflect a construction without verb raising. Combining this idea with Rizzi's approach of the least marked morphological form, we would expect that young children initially prefer trees that use (or project) as little of the functional hierarchy as possible. That is, given a standard tree such as the one in (6) (from Belletti 1990), the unmarked non-finite form involves Verb Raising no higher than to Aspect Phrase; that is, both children's early infinitives and participles would reflect such a structure. At the earliest stage, the verb does not raise any higher than this – children produce the morphologically least marked (well-formed) form by syntactically raising the verb to the lowest inflectional head. This allows them to either not use or not even project the higher projections.

(6)



In conclusion: regardless of the fact that Adult Greek has no infinitival forms, Greek children at the earliest stages nevertheless use a participial form which has the distribution of Root Infinitives in other languages. This means that the notion of 'Root Infinitive' is too narrow, while a broader term such as *Early Non-finite Form* is more appropriate.

The Child Greek data support the idea that children at an early stage construct sentences with an unmarked non-finite verb form. Under the participial analysis of the Child Greek *i*-form it is possible to state such a crosslinguistic generalization (cf. Rizzi 1993/4). The evidence for the non-finite participial analysis of the *i*-form comes from the incompatibility of this form with finite elements in the developmental sequence, from the distribution of null subjects, and from the prominent use of the Perfective stem in the relevant construction.

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