Clausal Structure in Child Greek:

A reply to Varlokosta, Vainikka and Rohrbacher and a reanalysis

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0. Introduction

Over the past few years the study of first language acquisition has profited enormously from the detailed investigation of different child languages. One important finding from this line of cross-linguistic research is that form the very earliest stages children are sensitive to morphosyntactic differences in the various input languages. Child languages manifest as much typological variation as the corresponding adult languages. This is true in the domain of head movement, for example - V2 languages are V2 languages "all the way down", that is, there is no stage at which children fail to respect the V2 requirement on finite verbs. (cf. Hyams 1992, Poeppel and Wexler 1993, Meisel and Muller 1992, Verrips and Weissenborn 1992, among many others). In the domain of null arguments, we find pro-drop in early "pro-drop" languages (Valian 1991, Rizzi 1994), topic-drop in early "topic-drop" languages (de Haan and Tuijnmann 1988). And even in the domain of inflectional morphology, where language particular variation is the richest, children acquire the specifics of the target language at a strikingly early age. In Hoekstra and Hyams (1998) we refer to this finding as Early Morphosyntactic Convergence (EMC).

A particular area of grammar where children seem not to converge immediately on the adult target concerns the requirement that root clauses be finite. In a number of different child languages we find infinitives in root contexts (henceforth, root infinitives (RIs)), as in (1).

(1) a. Papa schoenen wassen. Dutch
Daddy shoes wash-inf.
b. Michel dormir. French
Michel sleep-inf.
c. Thorstn das haben. German
Thorstn that have-inf.
d. Jag också hoppa där å där. Swedish
I also hop-inf. there and there
e. Eve sit floor. English

Children acquiring various languages including German, Dutch, French, Swedish show a robust RI effect. The age at which the phenomenon occurs is roughly between 2;0 and 2;6. During this time RIs constitute between 30%-70 of the children's verbal utterances. The remaining verbal utterances are adult-like finite clauses. Thus, RIs occur side by side well-formed finite sentences. This is an important property of this stage.

Wexler (1994) proposed that sentences such as in (1e) are the English analogue of the RI. As we will discuss shortly, the English construction differs from the other languages in various respects. Most notably, infinitival morphology is lacking. For this reason we refer to this as the 'bare verb' construction.

Although RIs are also possible in adult language, for example, the *Mad Magazine* sentences, discussed by Akmajian (1984) as in (2a), or jussives, as in the Dutch example in (2b), children's use of RIs (and bare verbs) is much wider, occurring in contexts that are not possible in adult language.

(2) a. John marry my sister. Never!
b. Hier geen fietsen platsen
'No bicycle parking here'

Interestingly, the RI phenomenon is not a universal property of child language. Children acquiring Italian, Spanish, Portuguese and Catalan do not show an RI stage. This finding leads to the hypothesis that the RI stage is tied to morphosyntactic properties of the adult target (e.g. Sano and Hyams 1994, Hoekstra and Hyams 1996, Rizzi 1994, Rhee and Wexler 1995) -- basically that RIs do not occur in languages with syntactically strong agreement. So, although at first blush RIs seem undermine morphosyntactic convergence, they actually support it in so far as their occurrence in different child languages mirrors a morphosyntactic property of the targets, the presence or absence of 'rich' or 'strong' AGR.

Although children acquiring the rich AGR/null subject languages do not exhibit an RI stage, they do produce bare participles (i.e. participles unsupported by an auxiliary), as in (3a). The adult target is given in (3b).

(3) a. Presa Checco campana (child utterance)
taken Checco bell
b. Francesco ha preso la campana (adult target)
'Francesco has taken the bell'

It is possible (though this remains to be shown empirically) that RIs and bare participles are manifestations of a more general root non-finite stage. However, as we show below, RIs and bare participles are nevertheless structurally and semantically distinct -- just as infinitives and participles are distinct in adult grammar. This difference is underscored by the fact that in languages where children use both RIs and bare participles, for example French, there is little evidence that the different forms are used interchangeably. We will have more to say about the interpretive properties of non-finite forms below.

In the context of early morphological convergence and the crosslinguistic differences among child languages, the findings of Varlokosta, Vainikka and Rohrbacher (VVR) (1998) on child Greek are extremely interesting. In a paper that appears in this journal, VVR consider the development of functional structure in early Greek. They argue that Greek children produce a structure that shares many of the properties of RIs. What is remarkable about this finding is that Greek is a language without an infinitival form. The kind of utterance that VVR analyze as the Greek analogue of the RI is exemplified by the sentence in (4).

(4) Pio vav<si (Stephany 1986)
Spiros read

The salient feature of this "RI analogue" is that it is a perfective verb with an *-i* affix. VVR refer to this verb form as the *-i* form and much of their analysis (and this reply) is centered on the status of the *-i* form. In the adult language, the *-i* form corresponds to two homophonous forms -- a perfect participle, as in (5a), and the 3rd person perfective form found in subjunctive and future clauses, as illustrated in (5b). These examples are from the adult language. [1]

(5) a. O SpPros exi ***iav<si** (adult sentence)
'Spiros has read '
b. O SpPros 2a/na ***iav<si** (adult sentence)
the Spiros future/subj read-perfective present 3rd sing.
'Spiros is going to/should read'

Henceforth, we will refer to sentences such as (4) as 'bare perfectives'. This is intended to underscore the fact that the perfective verb in these sentences is not supported by either a modal particle (as in the adult example in 5b) or an auxiliary (as in the adult example in (5a)). VVR argue that the bare perfective is a non-finite form, and more specifically, that it is a child version

[1] The child's form 'vavasi' involves a phonological substitution/simplification of the interdental fricative with a labio-dental, a very common early phonological process.

of the participial structure exemplified in (5a). Thus, on their analysis, it is analogous to the bare participles produced by Italian speaking children, illustrated in (3a). For reasons we will discuss below, VVR specifically argue against identifying the bare perfective as a child version of the subjunctive/future structure illustrated in (5b). [2]

VVR make a number of more general claims concerning the child's acquisition of functional structure and its relation to the RI and bare participle phenomena. First, they argue that Greek children (and by extension, all children) pass through a prefunctional grammar stage, that is, a stage during which the grammar lacks Infl-related projections (Radford 1990). During this stage children only project the lower "lexical" part of the tree (VP plus an ASP(ect) projection) and this gives rise to RIs and BPs (which they take to occupy VP and ASPP respectively). In order to explain the fact that Greek children pick a "participle" to instantiate the RI, while in other languages children use infinitives, VVR propose a markedness principle, a kind of minimal projection principle, according to which children project only as much structure as is needed to satisfy conditions of morphological well-formedness. Since Greek does not have

[2] Traditional Greek grammars refer to the second member of the periphrastic perfect following the auxiliary *exo/exi* etc. (have) as a participle and VVR follow this usage. However, this element does not exhibit the behavior of true participles (e.g. it cannot occur as a predicate of a linking verb and cannot be used adjectivally), while the forms that do occur in the latter environments cannot occur with the auxiliary *have*. For these reasons Holton, Mackridge and Philippaki-Warbutron (1997) refer to the *-i* form in (5a) simply as a 'non-finite verb form' to indicate that it is not a true participle. For ease of exposition we will follow VVR and refer to this form as a participle. This terminological issue does not affect the substance of the discussion. My thanks to one of the reviewers for pointing out this terminological problem.

an infinitive, Greek children cannot stop at VP (which houses the infinitive by their assumption) but must project up to ASPP -- where the participle resides. Dutch children, on the other hand, can stop at VP since there is an infinitive in Dutch.

Although the Greek results are quite interesting, we find much of the analysis that VVR propose problematic. On the assumption that functional structure is part of the basic blueprint of language, the hypothesis that Greek children have a prefunctional grammar violates the continuity assumption, that is, the restrictive hypothesis that child grammars do not fall outside the limits of Universal Grammar. Continuity is thus desirable on conceptual grounds. In addition, VVR's proposal runs into a number of empirical problems. In what follows we focus on 3 specific claims and argue that they do not hold up under empirical scrutiny. First, in section 1, we discuss the claim that children pass through a prefunctional grammar stage. Note that this claim is also directly at odds with the crosslinguistic findings of early morphosyntactic convergence mentioned above. Since there is a vast amount of literature on this topic, we will only review several of the relevant findings from other languages. In section 2 we turn our attention to the Greek data. We will see that Greek children also show an early convergence on the adult target and do not show evidence of prefunctional grammar, contrary to VVR's claims. In section 3 we focus specifically on the analysis of the bare perfective and argue against identifying this form as a participle. The evidence suggests, in fact, that the bare perfective corresponds most closely to the modal/future structure illustrated in (5b). In this section we also discuss VVR's markedness/minimal projection principle and show that it is not supported cross-linguistically. Finally, in section 4 we propose an analysis of the bare perfective that we believe to be a better fit with the empirical data. In this analysis we propose that the bare perfective used by young Greek children falls out of general principles of grammar that implicate high functional

structure. We also extend a proposal in Hyams (2001a,b) that takes the semantic values of particular morphosyntactic heads as a significant factor determining their acquisition and distribution in early grammar.

1. Early Morphosyntactic Convergence

As a point of departure we provide some background on the debate concerning the development of functional structure in early grammar.

There are various positions on the status of functional structure in early child language. One position, known as the 'full clause hypothesis' (Hyams 1992, Poeppel and Wexler 1993, Verrips and Weissenborn 1992) is that even though child languages vary (like their adult counterparts), probably as a function of differences in the spell-out of functional categories (cf. Borer 1981), they are identical at the level of the abstract functional architecture. To illustrate, according to the full clause hypothesis, all languages, adult and child, have a T/AGR-projection, an ASP-projection and so on. Differences between languages result from the different morphosyntactic specifications of these projections, e.g. in terms of richness of the paradigm. However, children are sensitive to the syntactic consequences of the AGR specification of the target even before they acquire the full set of agreeing forms of the adult language. For example, Italian children will allow pro-drop (while Dutch children do not), French children raise verbs (while Swedish children do not) and so on, and this is true even at a point at which Italian and French children are using only the singular present tense verbal affixes (cf. Pizzuto and Caselli 1992; Hyams 1992, Pierce 1992, Ferdinand 1996), that is, prior to the acquisition of a complete verbal paradigm.

The full clause hypothesis competes with the maturational position championed by

Radford (1990) and others, according to which there is a stage in which functional categories are entirely lacking. In view of early morphosyntactic convergence, however, this position is no longer tenable, as we will show below. There are also several intermediate positions in the literature, most notably the position advocated by Clahsen and associates (Clahsen 1991, Clahsen and Penke 1992, Clahsen, Eisenbeiss and Penke 1996). Their 'structure-building/lexical learning' model holds that functional structure is acquired piecemeal, driven by the acquisition of target forms (e.g. agreement and case paradigms). On this approach, children build up functional structure gradually and there is an early stage at which the tree is "flatter" than the adult tree.

As we noted earlier, there is substantial crosslinguistic evidence for early morphosyntactic convergence and against the hypothesis that children do not have full clausal structure. We focus on 3 areas that will be most relevant to the analysis of the Greek data: the status of agreement in early child languages and its relation to RIs, the use of null subjects, and the correlation of meaning to (inflectional) form.

1.1. Agreement and RIs

As has been amply documented, children obey spec-head agreement requirements from the earliest stage, even prior to the point at which they produce all the forms in a paradigm. For example, singular verb morphology is typically acquired before plural morphology, and 1st and 3nd person forms appear earlier than 2nd person. Nevertheless, agreement is almost always correct for those forms that are used. The following table summarizes the results of various studies. Across children and languages agreement errors are under 4% (cf. Hoekstra, Hyams and Becker (1996) for further discussion).

Table 1. Percentage of subject-verb agreement errors in early language[3]

Child	Language	Age	n	%error	Source
Simone	German	1;7-2;8	1732	1%	Clahsen and Penke 1992
Martina*	Italian	1;8-2;7	478	1.6%	Guasti 1994
Diana*	Italian	1;10-2;6	610	1.5%	Guasti 1994
Guglielmo*	Italian	2;2-2;7	201	3.3%	Guasti 1994
Claudia	Italian	1;4-2;4	1410	3%	Pizzuto and Caselli 1992
Francesco	Italian	1;5-2;10	1264	2%	Pizzuto and Caselli 1992
Marco	Italian	1;5-3;0	415	4%	Pizzuto and Caselli 1992
Marti*	Cat/Span	1;9-2;5	178	.56%	Torrens 1992
Josep*	Cat/Span	1;9-2;6	136	3%	Torrens 1992
Gisela*	Catalan	1;10-2;6	81	1.2%	Torrens 1992
Guillem*	Catalan	1;9-2;6	129	2.3%	Torrens 1992

These results are compatible with the full clause hypothesis, which dissociates grammatical and lexical knowledge. Children may have the relevant structure even when they have an incomplete paradigm. On the other hand, the input-driven, structure-building/lexical learning hypothesis

[3] The corpora marked with an asterisk are to be found on CHILDES, MacWhinney and Snow, 1985: Martin, Guglielmo, Diana corpora, Cipriani et al. 1991; Marti, Josep, Guillem, Gisela corpora: Serra and Solé, 1992.

postulates that all children start out with a 'no AGR' stage. The syntactic AGR-node is only projected when the child has acquired a sufficient number of forms in a paradigm, and only if the (adult) language manifests agreement to begin with. On this model, early morphosyntactic convergence is not expected, contrary to fact. Similarly, the prefunctional grammar hypothesis predicts a random use of inflectional morphemes, since these do not correspond to any grammatical category, again contrary to fact.

As noted earlier, the RI phenomenon itself seems to be dependent on properties of AGR. The Romance pro-drop languages - e.g. Italian, Spanish, Portuguese -. do not show an RI stage even though the adult versions of these languages do have an infinitival form (e.g. *parlare, hablar, etc.* 'speak'). Hoekstra and Hyams (1996) proposed that the RI stage is related to the 'richness' or 'strength' of Person agreement morphology. Italian, Catalan and Spanish - the non-RI languages - have syntactically rich person morphology, while Dutch, French, German - the RI languages - do not .[4] As we can see, the effects of early morphosyntactic convergence may be rather subtle and complex. Children do not necessarily exhibit an RI stage just because the adult language has an infinitival form. Other morphosyntactic conditions must be fulfilled as well. It

[4] There are various ways to understand the notion 'syntactically rich' person agreement. The RI and non-RI languages differ in terms of their pro-drop possibilities. Thus, 'rich' agreement may refer to those features are that sufficient to license null subjects. Alternatively, 'rich' agreement can be understood as referring to ability of AGR to attract infinitives (cf. Belletti 1990). This would also make the right cut between the RI and non-RI languages (as suggested in Rizzi 1994). Any attempt to more precisely characterize the morphological difference between RI and non-RI languages is beyond the scope of this paper, but see Rizzi (1994), Rhee and Wexler (1995), Sano and Hyams (1994), and Hoekstra and Hyams (1998) for some proposals.

is thus clear that theories which postulate a no-AGR stage, such as the prefunctional grammar hypothesis or the structure-building/lexical learning hypothesis, cannot account for the RI phenomenon in principle because they cannot exploit differences in the AGR systems of the relevant languages

A final important point concerning agreement and RIs is that RIs typically alternate with finite forms. RIs generally comprise between 30-70% of the verbal utterances in a corpus. (The reasons for the variability across children and languages is not well understood, but see Philips 1995 for some interesting ideas. The literature provides several hypotheses concerning this RI/finite verb alternation. Schütze and Wexler (1996) and Hoekstra and Hyams (1996, 1998) among others, argue in favor of optional underspecification of functional categories; for Schütze and Wexler, Tense and/or AGR is optionally underspecified, while Hoekstra and Hyams argue that the underspecification of Number yields RIs. Rizzi (1994) proposes that RIs result from the optional truncation of the syntactic tree at a level below TP. The truncation hypothesis is based on the assumption that children, unlike adults, are not subject to the requirement to uniformly project full CP structures. Although these hypotheses differ in the precise description of RIs, they are in agreement with respect to the full clauses hypothesis. It is the availability of full clausal structure, hence higher functional projections AGRP, TP, etc., that allows for the generation of the adult-like finite forms that co-occur with RIs.

1.2. Null Subjects

One of the more robust findings emerging from the investigation of RIs in early grammar is that the subjects of these sentences are typically null, while the subjects of finite clauses occurring during the same period are typically overt. Table 2 (from Hoekstra and Hyams 1998)

summarizes the results of various studies that have looked at the null subject-RI contingency.

Table 2: Percentage of null and overt subjects in finite and non-finite clauses

		Finite Verbs			*Non-finite Verbs*			
Lang.	Child	overt	null	total	overt	null	total	source
Flemish	Maarten 1;11	75%	25%	92	11%	89%	100	Krämer
German	Simone 1;8-4;1	80%	20%	3636	11%	89%	2477	Behrens 1993
German	Andreas	92%	8%	220	32%	68%	68	Krämer 1993
French*	Nathalie 1;9-2;3	70%	30%	299	27%	73%	180	Krämer 1993
French*	Philippe 2;1-2;6	74%	26%	705	7%	93%	164	Krämer 1993
Dutch	Hein 2;3-3;1	68%	32%	3768	15%	85%	721	Haegeman 1994

*for French, only preverbal subjects were counted

In finite clauses the subject is overt between 70-92% of the time, while RIs have an equally high rate of null subjects, between 73-93%. There are important implications of this finding. First, it casts serious doubt on the claim that early null subjects in non-null subject languages such as English and German represent a missetting of the null subject parameter, as originally argued in Hyams (1983,1986). If children acquiring German, Dutch, French, etc. had a null subject grammar, we would expect a substantially higher proportion of null subjects in finite contexts. The rate of null subjects in young Italian speaking children is roughly 70%, similar to the rate in the adult language (Valian 1991), but far higher than the rate in the languages represented in table 2. As originally argued by Valian, the crosslinguistic differences in the rate

of null subjects in finite contexts strongly suggests that the null subject parameter is correctly set early in development, in line with early morphosyntactic convergence. Moreover, the high rate of null subjects in RI contexts supports the claim that RIs are indeed non-finite. As non-finite clauses they provide a licensing context for the null subject, analogous to the situation in the respective adult languages, which license PRO in embedded infinitival clauses. [5]

1.3. Form meaning relations

Children are not only sensitive to the formal features of the adult 'target' grammar, but also to the interpretive properties associated with different tense and aspectual forms. This sensitivity is

[5] With regard to the null subject-non-finiteness relation, English presents a complicated situation. With lexical verbs English-speaking children seem to use overt subjects in roughly equal proportions in finite and non-finite contexts: For example, according to Philips (1995) Eve's (1;6-2;3) rate of overt subjects in finite contexts is 90% and 89% in non-finite contexts. Similarly, Adam (2;3-3;0) uses overt subjects 69% of the time with finite verbs and 80% of the time with non-finite verbs. However, in English the overt subject-finiteness contingency shows up in other contexts: null subjects so not occur with finite forms of the verb *be* (Sano and Hyams 1994), nor with (the inherently finite) modals (Valian 1991), and the subject-finiteness contingency also shows up in *Wh* questions (*Where going? vs. Where Mommy goes*?) (Roeper and Rorhbacher 1994; Bromberg and Wexler 1995**).** The lack of a contingency with lexical verbs in declarative contexts may be due to an additional 'topic/diary drop' option for finite verbs (cf. Hyams and Wexler 1992; Rizzi 1994, Haegemann 1994), though this raises the question of why there is no topic/diary drop with modals or *be*. (This latter point was noted by Colin Philips (p.c.) and an anonymous TLR reviewer.)

shown, for instance, by the way in which inherent verbal aspect (Aktionsart) influences the distribution of different tense/aspect forms in child language. For example, English *-ing* is an early acquisition and children appropriately restrict the progressive affix to eventive verbs (Brown 1973). Brown's finding is replicated in numerous studies of other languages, which show that children have early knowledge of stativity/eventivity and adhere to the language particular morphological restrictions imposed by this semantic distinction (cf. Cziko, 1989 for discussion of Japanese and Aksu-koç, 1988 for Turkish.) Similarly, in various languages, the perfect participle is mainly used with change of state and accomplishment verbs, as first reported for Italian by Antinucci and Miller (1976). Such claims abound in the literature. For example, Bloom et al. (1980) point out that English speaking children's use of different inflections is conditioned by inherent aspect. This is confirmed in a recent study by Olsen and Weinberg (1999), who find that children largely restrict *–ed* to telic verbs and *-ing* to dynamic, durative verbs. De Haan (1986) and Jordens (1990) both point out that in Dutch there is a strong correlation between form/position of verbs and their inherent semantics. (See Wagner, 1998 for review of much relevant literature.)

More recently, Hoekstra and Hyams (1998) showed that the interpretation of root infinitives is also conditioned by morphological properties of the adult languages. It has regularly been observed that there is an constraint on the aspectual nature of RIs in languages such as Dutch and French, which is that only eventive verbs show up as RIs, while stative verbs typically require finiteness (de Haan 1986, Jordens 1990, Ferdinand, 1996, Wijnen 1996). Wijnen observes that the overwhelming majority of Dutch RIs are eventive, while finite verbs are split evenly between eventive and statives. In Hoekstra and Hyams we call this the 'eventivity constraint' on RIs. A second finding is that RIs typically receive a modal interpretation, as

illustrated by the examples in (5) (cf. Hoekstra and Jordens 1994; Wijnen 1996; Plunkett and Strømqvist 1990; Ingram and Thompson 1996). Hoekstra and Hyams refer to this as the 'modal reference effect'. For example, Wijnen (1996) calculates that approximately 86% of Dutch RIs have a modal reading (cf. Wijnen, 1996 and Hoekstra and Hyams, 1998 for further discussion.)

(6) a. Niekje buiten spelen.
Niekje outside play-INF
'Niek (talking about himself) wants to play outside.'
b. 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 marked contrast to the situation in Dutch, Hoekstra and Hyams note that the English bare verb observes neither the eventivity constraint (25% to 40% of English bare verbs are non-eventive) nor the modal reference effect (86% of English bare verbs have a temporal (past or present) rather than modal interpretation). The English bare verb sentences in (7) are typical. (See Hoekstra and Hyams 1998 for further discussion.)

(7) a. Papa want apple.
b. Adam write pencil (while writing on someone's pencil)

The fact that Dutch (and many other languages) show both the eventivity constraint and the modal reference effect, while English shows neither suggests that the two effects are related. Hoekstra and Hyams (1998) argue that the modal or irrealis interpretation of RIs comes from the infinitival morpheme itself (cf. also Bolinger 1968, Duffley 1992, Stowell, 1982).

The modal reference effect has been observed in German (Ingram and Thompson 1996, Lasser 1997, Becker and Hyams 2000; French (Ferdinand 1996, de Cat (p.c.); Swedish (Plunkett and Strømqvist 1990). These are all languages that have distinct infinitival morphology. Further evidence for this claim is provided by Blom and Wijnen, (2000) who observe that the modal meaning of RI in Dutch child language emerges at the point at which children first recognize the

internal structure of the infinitive, as distinct from the finite forms. Prior to this point Dutch children use only RIs, which may have either a modal or temporal meaning. [6]

Turning to English, if the modality of RIs is due to the infinitival morpheme, then we expect that the English bare form, which lacks an infinitival ending, will not show a modal reference effect. As we have seen, this is the case. Rather, English bare verb sentences receive a (pragmatically determined) temporal interpretation.[7]

Hoekstra and Hyams further propose that the eventivity constraint follows from the modal nature of RIs. Deontic modality tends to exclude stative predicates. Thus, the sentence in (8), for example, is ungrammatical on a deontic (non-inchoative) reading. (cf. Barbiers 1995 and Hoekstra and Hyams 1998 for further discussion of the relation between eventivity and modality). [8]

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[6] Later we will modify the hypothesis that the modality comes from the infinitival morpheme itself and propose instead that infinitival morphology licenses or 'Agrees' with a Mood head that expresses modality. For our present discussion these technical differences are not relevant.

[7] The irrealis interpretation associated with infinitives in adult English is due to the presence of *to,* which we would argue licenses MoodP (See Stowell 1982 and Duffley 1992 for discussion of the modal properties of English infinitives). In Hyams (2001) I suggest that the functional equivalent of the RI for English speaking children are clauses with semi-auxiliaries such as *gonna, wanna hafta*.which contain an incorporated *to*.

[8] In a very interesting analysis van Gelderen (2001) proposes that English deontic modals originate in the head of AspP and that statives also occur in this same position. Deontic modals and statives are therefore in complementary distribution and a deontic reading of statives is excluded for structural reasons.

(8) Jan moet/kan het antwoord weten
'John must/can the answer know'

Since children's RIs express deontic modality, stative predicates are excluded. In the English bare verb structure, in contrast, there is no infinitival morpheme, hence no modality and thus both stative and eventive predicates are possible. The main point for our present purposes is that children have essentially correct morpho-semantic mappings. They understand the aspectual and modal meanings of the inflectional forms in their language. They do not, for example, use past participles to refer to ongoing events, or imperfective morphology to mark completed events. And even their use of RIs is conditioned by knowledge of the semantic properties associated with infinitives vs. bare forms.

In summary, across a wide range of child languages we find early morphosyntactic convergence on the target grammar. We see this with respect to the syntactic (eg. verb raising) and morphological reflexes of Agr(eement), as well as in children's null subject use. Even in the domain of root infinitives, which are not themselves a central feature of adult languages, we see the indirect effects of early convergence; children acquiring languages with strong Agr features do not exhibit an RI stage. Finally, the research into the semantics of children's early inflections shows that there is a strict mapping between form and meaning (often more restrictive than in the adult grammar), (e.g. perfective or past morphology is initially restricted to telic predicates.) The notion that children pass through a prefunctional grammar stage precisely misses the point that child grammars, even at the earliest stage, differ from each other in complex and subtle ways that reflect the variation found in the corresponding adult languages.

In their study of early Greek, VVR make a number of claims concerning the development of functional structure that are at odds with the picture of early development just outlined. Therefore, it is important to review the claims and their empirical basis. We will do this is the

following sections. We begin with the claim that Greek children pass through a prefunctional grammar stage.

2.0. Stages in the acquisition of Greek

VVR identify two distinct stages in the acquisition of Greek. Stage I is characterized by two properties. The first is the overgeneralization of *–i* affix to non-3rd person contexts (what we have called the 'bare perfective'). The second property of VVR's stage I is the purported lack of Infl-related elements. They claim that during stage I children show no evidence of having tense, modals, or the agreement paradigm, According to VVR, it is not until Stage II that Infl-related elements are used "productively" and the *–i* affix is no longer overgeneralized (i.e. no more bare perfectives). VVR thus conclude that during stage I the early grammar does not project Inflectional categories, such as AGRP and TP. In other words, they claim that the grammar is prefunctional and crucially, that the bare perfective is an effect of the grammar being prefunctional.[9] According to VVR, stage II marks the acquisition of agreement (and the other Infl-related elements) and AGRP is projected. Hence, at this point the number of bare

[9] VVR adopt a version of Clahsen et al's structure-building/-lexical learning modal, but with a truncation/minimal projection twist (cf. also Grimshaw 1994, Weissenborn 1994). Although VVR adopt a version of the structure building/lexical learning hypothesis to account for the alleged contingency between the bare perfective and the absence of an AGR projection in stage I, it should be noted that Clahsen et al. in fact find that German children continue to use RIs well beyond the no-AGR stage (i.e. after the acquisition of the agreement paradigm). Thus, there is no independent support for the claim that RIs correlate with a lack of Infl-related elements, or for the hypothesis that that RIs results from the absence of an AGR projection

perfectives decreases. The question we address in this section is: is there indeed evidence for two stages in the acquisition of Greek, in particular for an early stage during which children do not have agreement?

VVR's determination of stages is based on the transcripts of 3 children. For two of the children, Spiros and Mairi, there is only one data point represented. For the third child, Janna, there are data from two periods, ages 1;11 and 2;5. VVR place Spiros and Janna 1;11 at Stage I and Janna 2;5 and Mairi at Stage II,. Table 3 provides the relevant breakdown into stages.

Table 3. VVR's breakdown into stages

Stage I:	Spiros 1;9	Janna 1;11
Stage II:	Janna 2;5	Mairi 1;9

2.1. Agreement

Let us turn first to the claim that children at Stage I do not show agreement. Following that we will briefly consider the question of modals.

Analysis of VVR's data does not seem to support the breakdown into stages or the claim that there is an early stage without agreement. In table 4 we present the rate of correct agreement for verbs marked with 1st or 2nd person affixes, that is the percentage of cases in which a 1st or 2nd person verb is used with an appropriate 1st or 2nd person subject (based on VVR's table 7).

Table 4. Percentage of 1st and 2nd person verbs with 1st and 2nd person subjects

	Number correct	*Percentage correct*
Janna I	21/23	91%
Spiros I	15/18	83%
Janna II	105/106	99%
Mairi II	57/57	100%

Table 4 shows that at all data points agreement errors with 1st and 2nd person verbs are very infrequent - under 10%, except for Spiros I. The low error rate in early Greek is consistent with the agreement facts of most of the languages that have been examined (cf. table 1), and argues strongly that the early grammar contains AGR. As noted above, although young children may not use all of the forms in a paradigm, agreement is generally correct for those forms that are used. Thus, we should not confound acquisition of a complete paradigm with knowledge of the grammatical requirement of Spec-head agreement and the functional architecture involved therein. Children may clearly have the latter without the former.

Spiros has a lower rate of correct agreement than the other children. However, 83% correct agreement is still extremely high when we consider what VVR's no-AGR hypothesis predicts. If there is no AGR, there is no basis for checking agreement features, and thus the child should perform essentially at chance. Since the children use 3 affixes at this point (1st, 2nd,and 3rd person singular), chance performance would be about 33.3%. Thus, if affixes were assigned on a random basis, there would be only a 33% chance of correct agreement. Spiros' 83% rate is quite high by comparison, and is unexplained under the hypothesis that there is no AGR.

The agreement data also fail to support the claim of two distinct stages. There is only one data point for 2 of the 3 children, Spiros and Mairi, and Mairi, at the age of 1;9, is already at Stage II, (i.e. an adult for the purposes of this analysis). Janna, with two data points, is the only child for whom a comparative analysis can be done and her data can hardly be taken to support a stage model. First, the rates of agreement at Janna I and Janna II are very close (91% vs. 99%), certainly well above what would be expected by chance at both stages. In terms of frequency,

there are far more 1st and 2nd person verb tokens at Janna II than at Janna I, but absolute frequency is not in and of itself a very revealing measure of linguistic knowledge**.** In this regard it is interesting to note that verb frequency is not a good predictor of correct agreement. Mairi II uses far fewer (1st and 2nd person) verbs than Janna II, but has the same rate of correct agreement.[10] Let us now consider agreement with the 3rd person verbs -- the bare perfective.

Greek has two verbal stems, perfective and imperfective, and each may occur with the (3rd person) *-i* affix. The adult structure containing the finite perfective form was given in (5a). The imperfective form is provided in (9). The imperfective stem with an agreement affix forms the simple present tense

(9) Spiros pezi
Spiros play-imp-3rd per.
'Spiros is playing'

Thus, there are two *-i* forms that enter into an agreement relation - the 3rd person perfective form presented in (5b) and the 3rd person imperfective verb, presented in (9). Let us first consider how children do with the imperfective verb. Unfortunately, VVR present the relevant data only for Spiros I and Janna I. But since these are the children who are claimed not to have AGR, we can limit our attention to them. Table 5 presents the relevant figures.

[10] Valian (1991) proposes that the proportion of verbs to total utterances is a revealing measure of overall grammatical development, similar to MLU (mean length of utterance), but better for crosslinguistic comparisons. However, this is different from absolute frequency of verbs, which may simply reflects how talkative the child is.

Table 5. Percentage of 3rd person imperfective verbs with 3rd person subjects

	Number correct	*Percentage correct*
Janna I	29/35	83%
Spiros I	35/45	78%

Again we see that the rate of correct agreement, though lower than with 1st and 2nd person forms, is still rather high, certainly as compared to the chance performance we would expect to find if children did not have AGR at this stage. But in fact, the percentages in table 5 grossly underrepresent the rate of correct agreement. VVR note that 14 of the 16 agreement errors in table 5 are with verbs that have only a single stem form (e.g. *kani* - 'do-3rd person') and thus may be perfective forms. If we eliminate these cases, the rate of correct agreement with (clearly) imperfective 3rd person forms is 97% across the two children..

Let us now turn to the 3rd person perfective verbs (bare perfectives). As VVR note, here we see a rather different picture. Many of the bare perfectives occur in non-3rd person contexts, i.e. with 1st and 2nd subjects. An example is given in (10). It should be noted that most of these sentences contain null subjects and hence the 1st/2nd person reference is inferred on the basis of discourse context.

(10) PBri (u(un<ki
Take-perf. 3rd sing. Piggy
'May I take the piggy?'

The percentage and absolute number of correctly agreeing 3rd person verbs is given in table 6 (based on VVR's table 6).

Table 6. Percentage of perfective 3rd person verbs *(-i* form) with 3rd person subjects[11]

	Number correct	*Percentage correct*
Janna I	28/45	62%
Spiros I	58/96	60%
Janna II	62/62	100%
Mairi II	35/50	70%

Indeed, we find that the bare perfective occurs in non-3rd person, that is, non-agreeing contexts considerably more often than any of the other verb forms we have considered. Two questions arise: First, why do we find an 'overgeneration' of the bare perfective? Second, do these overgenerated forms provide evidence of two distinct stages?

We address the stage issue first. Although Mairi is identified by VVR as being in Stage II, she is rather close to Spiros I and Janna I, on both the measures that VVR take a criterial. For example, if we take absolute number of verbs as a measure of stage (as VVR do), we find there are fewer verbs occurring at Mairi II than at Spiros I (50 vs. 96). Moreover, if we consider rate of correct use of 3rd person forms, it is unclear on what basis VVR decide that 60% -- 62% correct agreement indicates a prefunctional grammar, while 70% indicates an AGR projection. If anything, Stage I should be defined as chance performance (i.e. 33.3%), as noted above. Thus,

[11] In the figures for Janna II and Mairi II both perfective and imperfective *–i* form are included since VVR do not provide the breakdown for the stage II children. In the case of Janna II, this is irrelevant since her rate of correct agreement is 100%, hence there are no errors in either the perfective or imperfective forms. For Mairi II the issue is less clear since there is a 30% error rate. Given the overall findings, it is likely that most of the errors occur with the perfective form, but we do not know this for sure.

it is not at all clear that Mairi represents a distinct stage from Spiros I and Janna I. In Janna's data, we do see a sizable jump from 62% to 100% correct 3rd person agreement between the ages 1;9 and 2;5. If such a jump were to happen across the board, it would be suggestive of a developmental shift, but as we observed earlier, there is no similar change in her performance with 1st and 2nd person verbs. (cf. table 3). The difference in agreement rates at the two data points is a fact to be explained, but it is certainly not evidence for a prefunctional stage.

We return to agreement issue in section 4. First, we briefly discuss the other evidence for a prefunctional stage, the lack of modals in stage I.

2.2. Modals

As noted in the introduction, Greek has a modal construction consisting of a subjunctive particle *na* or a future particle *θa* preceding the verb. *θa* occurs in root contexts as in (11a). *Na* is most commonly used in embedded contexts under intensional verbs such as *theli* (want*)* or *prepi* (have to) as in (11b), and it may also occur in root contexts with various modal meanings as exemplified in (11c). [12] *Na/θa* have been analyzed as functional elements occupying a position within IP (cf. for example, Veloudis and Philippaki-Warburton 1983, Campos 1989, Tsimpli 1990, Rivero 1994 among others) or within the CP domain (Agouraki 1991; Tsoulos 1993; Rousseau 2000). We will have more to say about the phrase structure position of *na/θa* in section

[12] Philippaki-Warburton and Veloudis (1985) list the following among the possible meanings for a root *na* clause in the adult language: desire, will, exhortation or prohibition, wish or curse, etc. What all these meanings share is an irrealis core. Further differences in interpretation may be due to pragmatic factors. See for example, Rouchota (1991) for a relevance-theoretic account of the different varieties of irrealis meaning associated with *na*-clauses.

4.

(11) a. O SpPros 2a ∗iav<si/ ∗iav<zi
the Spiros future read-perf./imperf.- 3rd sing.
'Spiros will read/be reading'

b. O SpPros theli/prepi na ∗iav<si/ ∗iav<zi
the Spiros want-3rd per./need-3rd per. subj. read--perf./imperf.-3rd sing
'Spiros wants/needs to read/be reading.'

c. O SpPros na ∗iav<si / ∗iav<zi
the Spiros subj. read-perf/ imperf-3rd sing.
'Spiros should read/be reading' or 'I want Spiros to read/be reading'

VVR report that the *na* construction is used less frequently in Stage I than in Stage II. This is argued to follow from the lack of Infl-related projections during Stage I. Table 7 presents the frequency of modals out of all verbal utterances in Stages I and II.

Table 7. Percentage of verbal utterances with modal particles

Janna I	--	(1/88)
Spiros I	8%	(10/127)
Janna II	23%	(42/178)
Mairi II	17%	(21/133)

VVR claim that *na* is "productively used" at Stage II, but not at Stage I, but they do not provide a criterion for "productive" use nor do they provide adult frequencies. Without adult norms we do not know what would constitute an average frequency of *na* in the adult language, hence what we should be comparing the children's frequencies to. We can infer from the discussion that VVR's criterion for productive use is somewhere between (Spiros') 8% and (Mairi's) 17%, but no rationale is provided for this cut-off. As we did for the agreement rates, we can compare the frequency of *na* to the predictions of the prefunctional grammar model: if there are no Infl-related projections at stage I, we should not find any instances of *na*. While this is essentially

confirmed in the case of Janna, it is not for Spiros, although both children are classified as stage I. The only thing that is really clear from table 7 is that the frequency of *na* increases over time.

Summarizing the discussion thus far, we see little support for the claim that there is an early stage of Greek during which children do not have Infl-related projections. The rate of correct agreement with 1st and 2nd person verbs is very high, as it is in 3rd person imperfective verbs, even at the early stage. Modal use is lower in Stage I than Stage II, but it is greater (for Spiros) than is predicted by the prefunctional grammar model. If we reject the prefunctional grammar hypothesis, which has little empirical basis, we are left with two facts to explain: First, what accounts for the breakdown in agreement with the bare perfective, and second, why the increase in *na* (modal) structures over time? In section 4 we will outline an analysis of the bare perfective that addresses these issues. But first we discuss VVR's participal analysis of the bare perfective .

3.0. The Bare Perfective

3.1. The participle analysis

As noted earlier, VVR propose that the bare perfective (repeated as (12a)) is the Greek analogue of the RI found in languages such as German and Dutch. More specifically, they claim that the bare perfective corresponds to the (adult) participial structure (repeated as 12b), repeated below for ease of exposition.

(12) a. Pio v<vasi
b. O SpPros exi ***iav<si** (adult sentence)
'Spiros has read '

Below we will show that VVR's analogy is right in one sense – the bare perfective shares one crucial property with RIs, which is its interpretation. Like the RI, the bare perfective typically

expresses the child's wish, need, intention with respect to some eventuality. In other words, it has a modal or irrealis interpretation. However, the very fact of its interpretation is a strong argument against treating this form as a participle.

As discussed in section 1.3, there are robust crosslinguistic data showing that even very young children respect the semantic restrictions of particular morphological forms. For example, the bare participle used by Italian-speaking children (cf. 3) typically refers to past or closed events or resulting states of past events (Antinucci and Miller 1976). Thus, if the bare perfective is a bare participle we would expect it to have a perfective, i.e. completive meaning, as it does for Italian children. It should denote closed events. VVR do not discuss the meaning of the bare perfective in much detail. They do note, however, that it is not used in contexts where an adult would use the perfect (VVR p. 202). In other words, the bare perfective does not have the meaning of a participle. Indeed, Stephany (1981, 1986), and more recently, Baltazani (1997), looked closely at the meanings of bare perfectives. They point out that the interpretation of sentences like (4) is clearly modal, expressing intentions, wishes, and obligations (cf. also Katis 1984, Tsimpli 1992). Thus, with respect to interpretation, the bare perfective does not correspond at all to a participle. On the contrary, the meaning is closest to what in adult Greek is expressed by the *2a/na* clause (cf. 5b) – except that it lacks the modal, and as noted earlier, the meaning is also that expressed by RIs in other child languages.[13] Given that children do not

[13] Recall that in RIs the modal reference effect gives rise the eventivity contraint, viz. the restriction to eventive predicates. (cf. section 1.3) Interestingly, the bare perfective also shows an eventivity effect. Stephany (1981) provides a breakdown of the Greek children's verbs into aspectual classes. Her data show that 99% of the perfective forms (all but 4 of 984 examples) are eventive. Thus, the meaning of the *-i* form, as well as the aspectual restriction to eventive

typically assign wrong aspectual or modal meanings to inflectional forms, i.e. they show early convergence on the target form-meaning correlates, we take the mismatch between the modal meaning and participle form to be a very strong argument against analyzing the bare perfective as a participle. Thus, we take it as a desideratum of any analysis of the bare perfective that it explain its interpretation. On the one hand, the analysis must capture the relation of the bare perfective to the adult *ƨa/na* clauses, and on the other, its relation to the RI phenomenon.[14] We

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verbs, supports the hypothesis that it is an irrealis form, and not a participle.

[14] VVR's arguments for treating the bare perfective as the RI analogue are based on alleged similarities between it and the RI in distribution and frequency. However, each of these arguments is problematic in some respect. VVR argue that the bare perfective has the same frequency as RIs, but the frequency of RIs varies considerably from language to language -- from about 30% to 80% of verbal utterances -- and there is also variability among children within a particular language (Phillips 1995; Sano and Hyams 1994). It is not clear what significance to attach to these frequencies (beyond the fact of establishing that the RI phenomenon is a robust one and not likely due to performance error). Moreover, the range is so wide that it is not very surprising that the Greek data fall within it. Lots of things that are clearly not RIs will also fall within the 30% to 80% range. VVR's second argument is that the bare perfective typically occurs with null subjects (as do RIs (cf. section 1.2)). However, null subjects cannot be diagnostic of non-finiteness in early Greek. Unlike the RI languages, Greek is a null subject language and hence, null subjects are licensed in both finite and non-finite clauses. Finally, VVR claim that the bare perfective occurs during a stage when there are no other Infl-related elements (their no-AGR stage), and therefore must itself occupy a low (non-finite) position in the tree.

return shortly to the lack of overt modals in early Greek.

3.2. Minimal projection and markedness

VVR's motivation in analyzing the bare perfective as a participle is to find a structure that will not involve higher functional categories since by their hypothesis the early grammar does not project infl-related levels. They make the further claim that the early grammar is constrained by a minimal projection kind of economy principle according to which children project only as high as is required by morphological well-formedness requirements of the language. The markedness principle is also intended to explain the crosslinguistic variation that is found with respect to "RI-type phenomena". VVR's point of departure is that all children will go through a prefunctional grammar stage (which for them equates to an RI-stage - but see note 9), but that the "RI" will take a different form depending on the target language, the infinitive in Dutch, German, etc., the

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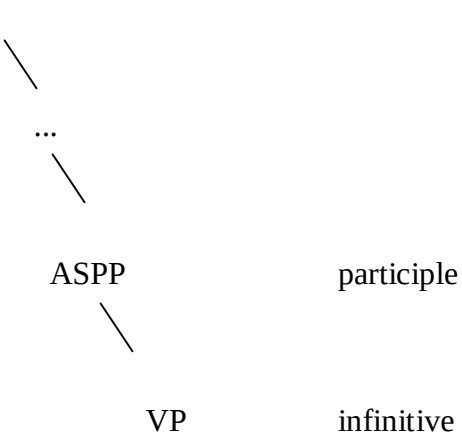
They argue that if the bare perfective were finite, "we would expect it to emerge along with other finite forms such as modals and verbs with productive tense and agreement morphology" (p. 198). As discussed in section 2.1, this claim is not empirically justified in light of the high rate of correct agreement. But even putting these data to the side, the formulation that VVR adopt simply asserts their hypothesis of a prefunctional stage. They take the low frequency of modals *na/2a* to indicate an absence of functional architecture, and then argue that it follows that bare perfectives cannot be finite (since that would require functional structure). If we carry this logic over to the RI languages that VVR take as criterial, we would have to assume that the presence of RIs in early French means that the apparently finite forms are also non-finite. Thus, *Mama dors* ('mommy sleeps') would then be non-finite because *Papa dormir* ('daddy sleep-inf') is non-finite. But it is well established that during the RI stage children use **both** finite and non-finite verbs and clearly distinguish the two. (cf. Pierce 1992, Poeppel and Wexler 1993, etc.).

bare form in English, the participle in Italian and Greek. According to VVR, the form that instantiates the "RI" is the 'least marked verbal form' in the language. To define least marked verbal form, VVR exploit the concept of truncation (Rizzi 1993/1994) (though they depart significantly from Rizzi in assuming that the Stage I children do not have functional structure). The least marked verbal form is that verb form of the language that involves the minimal projection, or put differently, a form for which the tree is truncated at the lowest possible point. The functional structure they assume is as in (13). (Irrelevant projections are omitted)

(13)



A further assumption is that a structure truncated at the VP-level yields an infinitive, a structure truncated at the ASPP level yields a participle, and the projection to AGRS yields a finite verb form. VVR posit a markedness hierarchy as in (14) (where < means less marked than).

(14) VP/infinitive < ASPP/participle < AGRS/finite verb

According to this hierarchy, infinitives are the least marked verbal form. Since Greek has no infinitives, Greek children cannot truncate at the VP-level. For these children the least marked verbal form is the participle, contrary to French, German, Dutch children, whose languages contain infinitives (cf. examples in (1)).

The markedness hierarchy that VVR propose is a rather technical approach to the

variation question and one that disregards the grammatical and semantic differences between participles and infinitives. To define the choice of infinitive vs. participle in a particular language as a function of markedness without any reference to the different semantic properties misses the very important point that children use particular forms in their language to express particular meanings – like adults do. But even putting semantic considerations to the side, the proposal is empirically inadequate as an account of the distribution of finite and non-finite forms across different child languages.

First, according to VVR's hierarchy finite forms are highly marked. However, as has been amply documented, non-finite forms alternate with finite forms even at the earliest stage of development (Dutch: Jordens 1990; Wijnen 1996; Haegemann 1994, German: Verrips and Weissenborn 1992; Meisel and Müller 1992; Poeppel and Wexler 1993, French: Pierce 1992; Ferdinand 1996). A theory that postulates a hierarchy according to which finite forms are highly marked does not explain this fundamental property of child language. Second, with respect to the use of non-finite forms, VVR's assumptions lead them to predict that a child language will use participles only if the target does not contain an infinitive. This prediction is clearly wrong. bare participles are found in French, side by side with RIs, and they are also found in Italian and Spanish, where there is both an infinitive and a participle in the adult language (eg. Italian *mangiare* 'eat'/ *mangiato* 'eaten'), but where the child language does not have RIs, as discussed earlier. By VVR's logic, Italian and Spanish-speaking children should project only as high as VP -- and not to ASPP. They should therefore have RIs, but not bare participles, directly contrary to fact (cf. Antelmi 1992; Guasti 1994; Sano and Hyams 1994). Thus, overall, there is little empirical support for the markedness hierarchy proposed by VVR as an explanation for different non-finite forms that children use.

Neither the prefunctional grammar hypothesis nor the minimal projection markedness hierarchy provides an empirically adequate description of the of bare participle phenomenon in early Greek, or the early crosslinguistic findings more generally. In what follows we consider two hypotheses more in line with the interpretative evidence.

3.3. A Null AUX hypothesis

Given the interpretation associated with the bare participle, an obvious alternative to the participle analysis is to say that the bare perfective is an approximation to the adults *na/2a* clause, given in (5b) (repeated below for ease of exposition). In other words, the bare perfective is an irrealis clause that lacks a modal.

(5) b. O SpPros 2a/na ***iav<si**
'Spiros is going to/should read-perf.'

One implementation of this idea would be to posit a null modal (null *na/2a*) in the child structure, along the lines that Boser et al. (1992) propose for German RIs.

Boser et al. argue that RIs and other non-finite structures in early German contain a null auxiliary in I (which raises to C), as in (15).

(15) $[_{CP}$ Papa $[_{C}\ 0_{aux\ i}\ [_{IP}$ Buch lesen] $t_i\ ]$
Daddy book read

They propose that the null auxiliary is licensed by an overt element in its specifier (similar to licensing conditions on null pronominals (cf. Speas 1994, among others)). The null aux hypothesis explains the sentence final position of the verb in RIs; the verb cannot raise to C because that position is occupied by a (null) auxiliary, and it also accounts for the modal interpretation of RIs (on the assumption that the null aux can be a modal). Prima facie, the null aux hypothesis would seem to provide a straightforward structural analysis of the Greek bare

perfective. We might posit a structure containing a null *na/2a*, as in (16).

(16) [$_{IP}$ O SpPros [$_{I}$ 0 $_{na/2a}$ [***iav<si**]]
Spiros (is going to/wants to) read'

There are, however, a number of empirical problems with the null aux hypothesis, both as an account of RIs, and as an account of the bare perfective. Most of the empirical problems associated with this hypothesis stem from the fact that it obliterates the distinction between finite and non-finite clauses. In order to motivate the V2 position of the auxiliary, Boser et al. must assume that the structure in (15) is finite. But if RIs are actually hidden finite structures, then there is no basis to explain the different distribution of RIs and finite verbs, for example, the fact that RIs typically occur with null subjects, while finite verbs occur with overt subjects, as discussed in section 1.2. (For discussion of other distributional differences that are unexplained on the null aux hypothesis, see Hoekstra and Hyams (1998)). The RI-null subject contingency also casts serious doubt on Boser et al's licensing condition, which requires that a null auxiliary have an overt specifier. Recall that the specifier of an RI is typically null (see table 2). An additional problem with the null aux account is that it fails to explain why non-finite forms in different child languages have different interpretations. If the grammars of young Dutch and German-speaking children allow a null modal, then so must the grammar of young English speakers. Yet, as we noted in section 1.3 the English bare form does not have a modal reading. What excludes a null modal in this case?

A null *na/2a* analysis is problematic as an account of the Greek child's bare perfective for the same reasons that make it an unlikely explanation for the RI phenomenon. Boser et al. assume that the only difference between the child's grammar and the adult's is the overtness of the auxiliary. Otherwise, the structures are identical. It therefore fails in principle to provide a

basis for explaining the salient differences that do exist between the child's irrealis structure and the adult's. There are three properties in particular that are in need of explanation. First, there is the "trade-off " that occurs between bare perfectives in the child grammar and overt modals in the adult grammar, discussed in section 2.2. VVR note that during the bare perfective stage *na/2a* occur very infrequently and they increase as the rate of bare perfectives decreases. Why do we find this trade-off? Second, in the adult grammar, the verb embedded under *na/2a* can be either perfective or imperfective, as illustrated in (17).

(17) a. O SpPros theli/ prepi na ***iav<zi**
the Spiros want-3rd per./need-3rd per. Subj. read--imperfective-3rd sing
'Spiros wants/has to be reading.'

b. O SpPros theli/ prepi na ***iav<si**
the Spiros want-3rd per./need-3rd per. Subj. read--perfective-3rd sing
'Spiros wants/has to read.'

In the child's grammar, in contrast, the irrealis form is overwhelmingly perfective. Stephany (1981) reports that of 1017 irrealis (eventive) verbs in her data, only 3% (36) are imperfective, as shown in the following table: [15]

[15] These data are based on Stephany 's (1981) table 3. Stephany reports separate figures for resultative and non-resultative eventives. Since this distinction is not relevant to our concerns, I have collapsed these two categories. Stephany also reports on the breakdown of stative verbs, which I have not included in table 8. There are a total of 54 stative verbs in her data, only 4 of which are irrealis, and hence relevant to this discussion. As just noted (see note 13), the Greek *-i* form shows an eventivity effect parallel to what we find with RIs, i.e. the irrealis forms are overwhelmingly eventive. Finally, I should note that although Stephany and VVR are working with the same corpora, the data is Stephany's table 3 covers a longer period than VVR's stage stage 4 (Stephany 1986).

Table 8. Breakdown of eventive verbs according to mood and aspect
(based on Stephany 1981)

	Mood	
Aspect	Irrealis	Realis
Perfective	981 (97%)	114 (30%)
Imperfective	36 (3%)	261 (70%)
Total	1017	375

This should be compared to the realis category which consists of both past perfective and present imperfective verbs. Since the imperfectives refer to on-going eventualities (which is what very young children talk about), it is not surprising that they outnumber the past perfectives. Returning to the irrealis forms, *w*hy do we find this restriction to the perfective form in the child's grammar but not the adult's? Finally, in the adult language the verb inside a *na/2a* clause agrees with the subject, whereas in the child's grammar, the bare perfective is an invariant, i.e. non-agreeing form**.** Let us summarize these points in (18):

(18) *Adult-child differences*
- Only perfective verbs have an irrealis interpretation in the child's grammar, while both perfective and imperfectives occur in *na/2a* clause in the adult grammar.
- Bare perfectives "trade-off" with *na/2a* clauses over time.
- Adult *na/2a* clauses show agreement, while the bare perfective does not.

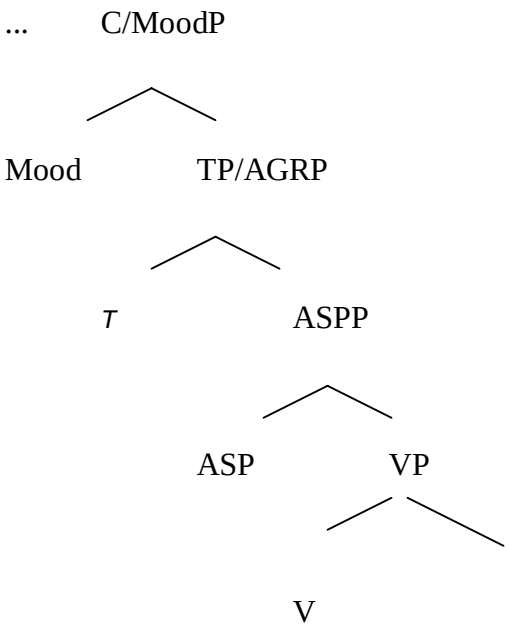
In what follows we will outline an analysis of the bare perfective that captures the essentially modal character of the structure (without the problems associated with the null aux hypothesis), and which also accounts for the grammatical differences between the adult and child grammar presented in (18). We will briefly outline that analysis below, but see Hyams (2002) for further details.

4.0. A Mood based analysis of the bare perfective

As a point of departure, we will assume that for adults and children alike temporal, aspectual and modal meanings are determined by the functional structure of the clause and not by the functional elements themselves. The functional elements are the spell-out of syntactic features that license functional structure [16]. We will therefore assume that the irrealis interpretation of the bare perfective is provided by an active MoodP in a manner to be described below.

I assume the relative ordering of functional heads in Greek is as in (19).

(19)



The structure in (19) follows proposals by Roussou (2000) and others, who have argued that in

[16] This is similar to the position adopted in Stowell (1995), where the temporal interpretation of the sentence is provided by TP (and related temporal arguments). According to Stowell, the English past and present tense morphemes do not themselves provide the meaning of temporal ordering; rather, they function as polarity items that are licensed by a particular scope relation to a phonetically unrealized past Tense.

the adult grammar the modal and future particles *na/ʔa* occur in a C-related position. There have been various proposals as to the exact specification and location of the inflectional category hosting the modal particles. For example, Rivero (1994) suggests that *na/ʔa* are located in a ModalP just above TP, Tsimpli (1992) argues that they head MoodP, Philippaki-Warburton (1992) proposes that *na* heads a MoodP just below C and *ʔa* heads TP, Agouraki (1991) and Tsoulas (1993) argue that *na/ʔa* are complementizer elements. We will adopt the proposal of Roussou (2000), who argues that *na* and *ʔa* are both generated in a lower C head that is specified for mood --$C_{M(ood)}$. [17] Roussou assumes an extended CP domain along the lines of Rizzi (1997) and her C_M is roughly equivalent to Rizzi's Fin (the lowest of his CP projections). Roussou further assumes that *na* (but not *ʔa*) raises to a higher $C_{Op(erator)}$ position (roughly Rizzi's Force), thus accounting for differences in the relative ordering of *na* and *ʔa* with respect to negation, and reflecting the fact that *na* is both a modal element and a clausal typing element that can occur in a root clause (cf. 11c). In Roussou's terms, *na* spells out both Mood and Force features. This movement of *na* will be largely irrelevant to our concerns. The relevant portion of Roussou's structure in given in (20).

(20) .... [C_{Op} [(Neg) [C_M *na/ʔa* [...I...]]]]

In the tree in (19) we have omitted all irrelevant heads. We also assume a unitary T/AGR projection and an ASP projection above VP. Henceforth, we refer to the projection containing modal/mood elements as MoodP for ease of exposition.

Zanuttini (1997) proposes that as with other functional heads, an active MoodP must be licensed by syntactic features. MoodP may be licensed by a modal element merged in its head or

[17] See Roussou (2000) for an overview of the relative merits and problems with these different proposals.

through checking by “appropriate" features in the verb. Appropriate features are features which "match" in some sense. We return to this issue below.

Zanuttini 's analysis of Mood is motivated by a curious interaction of imperative mood and negation in various Romance languages.[18] Her generalization is that preverbal negative markers are incompatible with true imperatives, as illustrated by the contrast in (21a,b).

(21) a. Telefona! (Italian)
call-imp.2nd sing.
'Call!' (familiar)
b. *Non telefona!
Neg call-imp. 2nd sg
'Don't call'

Zanuttini hypothesizes that the negative marker triggers the "activation" of a Mood Phrase, which must then be licensed by functional features. Lexical imperatives are deficient in features required to license Mood. Instead, the licensing requirement on Mood may be satisfied by various non-imperative inflectional features on the verb, e.g. subjunctive inflection, infinitival inflection, etc., as illustrated in (22 a,b). [19] Or it is licensed by a functional element merged into

[18] In fact, her generalization holds more widely (e.g. Greek, Icelandic, etc.), but she discusses only the Romance cases. The negative imperative phenomenon is also discussed in Rivero and Terzi (1995); Postma and van der Wurff (to appear).

[19] To be more precise, Zanuttini assumes (following Kayne 1992) that the infinitive structure in (22b) contains a null modal in the head of MoodP that does the licensing. The null modal analysis of Italian negative imperatives (like the null modal account of children's RIs - cf. section 3.3) runs into empirical problems. As noted by Rizzi (2000), overt restructuring modals can be followed by negative adverbs as in (i), but the same possibility does not exist for the assumed

Mood, for example, the subjunctive particles *mi/mu/ma* in the southern dialects of Italian (related to Greek *na*.), as in (22c).

(22) a. Non telefoni!
Neg call-3rd sg. subjunctive
'Don't call!' (polite)

b. Non telefonare!
Neg call-infinitive
'Don't call!' (familiar)

c. Mi nun nΠsci! (eastern Sicilian)
PRT neg. leave
'Leave!' (polite form)

Zanuttini notes further that in certain dialects of Italian, Mood in negative imperatives is licensed by the aspectual auxiliary *sta* (stay), as in (23a,b) [20] or a form of the perfective auxiliary 'have', as in (23c).

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null modal in the negative imperative in (ii). The only possibility for the adverb in this case is as in (iii).

(i) Non lo voglio pi⁂ mangiare
'I don't want it anymore to eat.'.

(ii) *Non lo pi⁂ mangiare!
'Don't it anymore eat!'

(iii) Non lo mangiare pi⁂!
'Don't eat it anymore!'

Thus, as we will discuss below (section 4.3), we assume that it is features in the infinitive itself that license MoodP.

[20] Although *sta* seems to be specific to the negative imperative in these dialects, it is related to (standard) Italian *stare* (stay/be), which occurs in the progressive construction *Gianni sta mangiando* - 'Gianni is eating'.)

(23) a. No sta (a) crodi! (Friulian)
Neg aux-stay *a* believe-inf.
'Don't believe that!

b. No st< parlare (Paduan)
Neg stay talk-inf.
'Don't talk!'

c. Nnə vv'avəssP a credərə (Molisse)
Neg you'had-pst. subj. a believe-inf.
'Don't believe that!'

In other languages, for example Portuguese, Mood in negative imperatives is licensed by the auxiliary 'go'.

(24) Nvo v< se afogar, moHo! (Portuguese)
Neg go self drown, young man
'Don't drown yourself, young man'

Notice that the auxiliaries in (23) and (24) are in the imperative form. In contrast to the lexical imperative illustrated in (21b), which does not have features to licenses Mood, Zanuttini assumes that the aspectual auxiliaries can license Mood through Merge, much like the modal particles exemplified (22c). However, if imperatives are lacking in those features required to license Mood, it is not obvious how imperative auxiliaries are able to overcome this deficiency. We will suggest that it is the aspectual feature in the auxiliary that licenses Mood in the examples in (23) and (24), hence the grammaticality of these cases, in contrast to examples such as (21b), which contains a lexical imperative verb. This relationship between mood and aspect will also explain the range of properties associated with the irrealis *-i* form used by Greek children. Before returning to the Greek data, let me say a bit more about the mood-aspect connection.

4.1. The mood-aspect connection

It is frequently observed that past tense features can have a modal or irrealis interpretation. For example, in counterfactual wishes and counterfactual conditionals, the tense morphology is

modally construed, as in the examples in (25a-b).

(25) a. I wish I **were/lived** in Italy now.
b. If Michael **took** driving lessons now, he could use the car this summer.

In these examples the bold-faced verbs do not have a past tense interpretation, as indicated by the adverbials. To adopt an expression from Iatridou (2000), the past tense in these cases is "fake". As discussed by Jesperson (1965) and Lyons (1977), and more recently, Iatridou (2000) and Ippolito (2001) (among many others), this syncretism between tense/aspect and mood morphology is a general feature of adult language. Iatridou proposes that the past tense feature is an 'exclusion feature' that takes both the time dimension and the world dimension in its range. Thus, the past feature can refer either to a or a world that is removed from the actual world , as in the counterfactual wishes and conditional in (25a,b) or a time that is removed from the actual time (past), as in (26).

(26) Michael took driving lessons last summer.

Thus, on Iatridou's analysis, one and the same morphosyntactic-semantic feature can have either a temporal or modal interpretation.

Translating these observations into a syntactic framework in which Tense and Mood are independent heads in a phrase structure configuration (as in (19)), one way of understanding the behavior of the past tense feature (Fpast) is in terms of feature checking. Fpast "matches" both Tense and Mood features and may license either. However, feature checking is biunique, so that Fpast may license Tense or Mood, but not both. A past irrealis interpretation, as in (27), requires two past features, one that licenses Tense and one that licenses Mood.

(27) If Mary had taken her medicine, she would feel better now.
[+pst] [+pst]

In what follows we will suggest that aspect features show a similar behavior. They can be

construed aspectually or modally. In particular, the perfective feature (Fperf) "matches", and hence, may license either Asp or Mood heads. The aspectual licensing of Mood is a property of early grammar, and may also be a property of adult grammar under certain conditions. To explore this hypothesis further, we return to the discussion of early Greek. We will then discuss possible related effects in adult grammar.

4.2. The licensing of Mood in early Greek

In adult Greek irrealis clauses, MoodP is licensed by the modal particles *na/2a*. As we have already established, the child's irrealis clause does not contain a modal particle. Indeed, it is in part the absence of the modal particles which leads VVR, and also Tsimpli (1992), to argue that the early grammar lacks higher functional projections. We will propose instead that the child grammar of Greek has the adult clause structure in (19) and that it is the aspectual feature in the bare perfective that is responsible for the licensing of Mood in the child's grammar. This hypothesis allows us to explain why the irrealis interpretation shows up with the perfective forms, while the imperfective forms typically have a temporal reading, as observed by Stephany (1981) and Katis (1984). We can explain this association between perfectivity and modality if the aspectual specification in the verb is necessary to license MoodP.

With this hypothesis in mind, let us return to the adult-child differences noted in (18), which we are now in a position to explain. The first observation was that in the child's grammar only the perfective form has an irrealis interpretation, while in adult Greek irrealis clauses can be either perfective or imperfective, as illustrated in the examples in (17). This difference is due to the availability in adult Greek of the modal particles -- *na/2a* . Following Zanuttini's hypothesis, we propose that these particles license MoodP through Merge. The aspectual feature in the verb

is thus free to do the "aspect job". Since in the adult grammar the perfective feature is not doing the "modal job", it follows that there will be no aspectual restriction on the verb. Indeed, as exemplified in the sentences in (17), adult *na/2a* clauses can be either perfective or imperfective. (Thus, the difference in the two grammars reduces to whether Mood is licensed by the merging of a modal particle *na/2a* or through checking by the aspect feature in the verb.)

This proposal raises the important question of why it is specifically the perfective feature that can do the modal job, rather than, say, the imperfective feature. One possibility has to do with the semantic closeness of perfectivity to past tense . For example, Shirai and Anderson (1995) propose a prototype treatment of tense and aspect according to which a closed (perfective) event is the prototypical past tense event**.** Demirdache and Uribe-Extebarria (1996), based on ideas of Klein (1995) and Stowell (1995), reduce tense and aspect to the same set of syntactic primitives. Perfective aspect and the past tense are both analyzed as spatio-temporal predicates with the meaning 'after'. This semantic closeness is reflected in the fact that in many languages without a tense system, Mandarin for example, temporal meaning comes about through aspectual marking. In these languages, perfective morphology gives rise to a past tense interpretation, while the imperfective is used to denote present tense. Thus, we might assume that the perfective morpheme is also an exclusion operator, as suggested by Iatridou for the past tense. As such, it has a dual function of ranging over times and over worlds**.** Thus, we will assume that the features Fpast and Fperf both "match" Mood in the sense relevant to feature checking and hence are both potential licensers. Shortly, we will return to the question of why we find Fpast doing this job in the adult grammar, and Fperf in the child grammar.

The second observation in (18) concerns the “trade-off” between the bare perfective and the *na/2a,* that is, the bare perfective occurs at a point in development when there are few if any

modals and then disappears when the modals become productive (cf. section 2.2). By our hypothesis, the bare perfective is a licenser of MoodP. As such, it fulfils the grammatical function of the *na/2a* in the adult grammar. Thus, the bare perfective decreases as the *na/2a* clause increases bare because there is a trade-off between functionally equivalent structures. [21] This proposal yields a prediction, which is that the productive use of *na/2a* should correlate with the use of both perfective and imperfective verbs in modals contexts: once the modals are acquired and the aspectual feature is no longer required to license MoodP, there should be no further restriction on the aspect of the verb. VVR do not provide the relevant information so this is a prediction to be tested.

The last point in (18) that we need to address is why the irrealis form is typically an invariant (i.e. non-agreeing form), or more precisely, why do we find a higher rate of non-concordance between the verb and the subject in this case. In considering this issue, the first thing to bear in mind is that this is not an agreement error in the strict sense. If children violated agreement rules, the errors would go in both directions, i.e. we would also find 1st and 2nd person verb forms with 3rd person subjects, contrary to fact (cf. table 4). If the bare perfective does not involve an agreement error, then it must be the case that this structure does not provide the syntactic context for agreement. Why would this be? We will suggest that the lack of agreement on the bare perfective follows as a direct structural consequence of the aspect-mood relation discussed above.

Thus far we have said little concerning the checking mechanisms involved in the

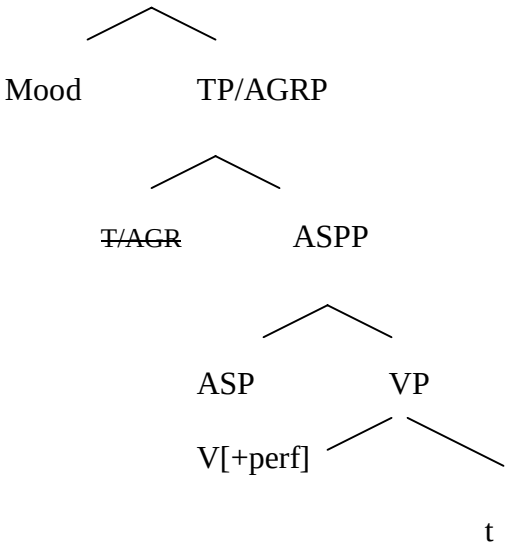
[21] This is rather similar to the effect found in Hyams and Wexler (1992), in which children's early null subject use decreased as their use of overt pronominal subjects increased. In the null subject case as well, there is a trade-off between functionally equivalent elements.

licensing of functional projections. Within the 'minimalist' framework, there are various feature checking proposals**,** some involving actual verb movement, others feature movement, and still others agreement without movement (Chomsky 1999)**.** What the various proposals share is an assumption that feature checking or licensing occurs under strict locality conditions, in other words that there be no intervening features between the two agreeing elements. For concreteness sake, we can adopt Chomsky's (1995) Attract F, which incorporates this locality condition (the Minimal Link Condition) as follows:

(28) K attracts F if F is the closest feature that can enter into a checking relation with a feature in K. (adapted from Chomsky 1995; 297)

We have assumed that a functional category is licensed either by merging a lexical element in the head of a functional projection (e.g. modal particles license MoodP in Greek) or through agreement with appropriate features in the verb. We argued that in the early grammar of Greek, Mood attracts the [+perfective] feature in the verb, and is thereby licensed. Returning to the phrase structure representation in (29), repeated below, it follows from (28) that there can be no features intervening between Mood and the perfective verb. In other words, T/AGR must be unspecified.

(29) C/MoodP



Thus, given the structural constraints on Attract/feature checking, the bare perfective is necessarily a non-agreeing form, with the unmarked *-i* affix emerging as the default where AGR is unspecified.[22]

To summarize, the analysis of the bare perfective we are suggesting is that under appropriate structural conditions certain temporal/aspectual features may license the higher MoodP. Following the intuition of Stephany (1981) and others, We are proposing that the bare perfective structure in early Greek is an instance of aspectually licensed mood. In structural terms, the bare perfective structure contains an active MoodP that is licensed by the perfective (Asp) feature in the verb under Attract. This explains both the modal meaning associated with

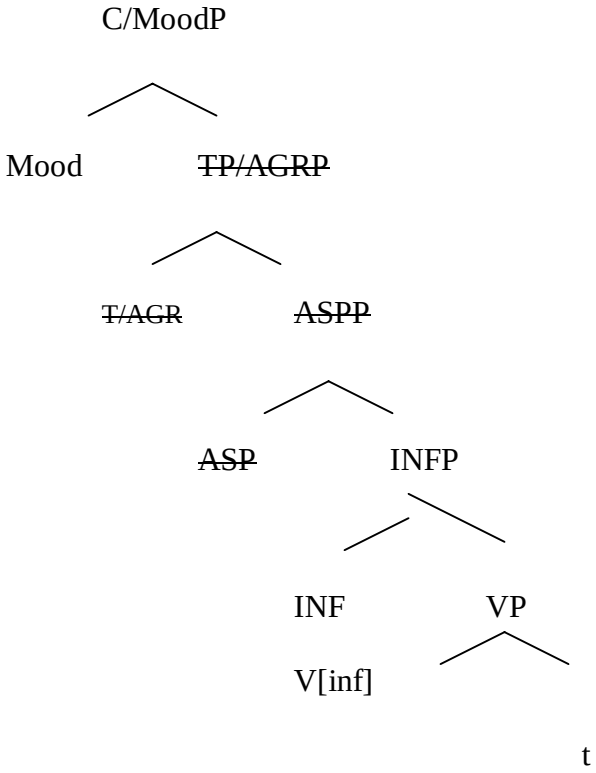
[22] It is not possible to determine empirically whether features are checked by verb movement to Mood or simply by feature attraction. Under verb movement we expect to find enclisis of object clitics, while feature attraction would result in proclisis. However, a search of the corpora reveals that there are no clitics at all during Stage 1.

the bare perfective (from MoodP), which is unexplained on VVR's participle analysis, as well as the restriction to perfective verbs (required for the licensing of MoodP). The various adult-child differences outline in (18) are also explained. In the absence of modal particles the early grammar avails itself of the feature checking option. The adult system emerges as the modals are acquired. We may assume, as proposed in Chomsky (1999), that Merge takes precedence over Move/Attract, such that once the modals are acquired, they push out the feature checking option.

4.3. Extension to RI languages

In this section we briefly discuss the implications of this analysis for the RI languages. As we noted earlier, RIs have an irrealis interpretation. We assume that as in the case of the Greek bare perfective, the modal interpretation of RIs is associated with an active MoodP. In RIs the MoodP projection is licensed by the infinitival morpheme, which we assume has an irrealis feature (cf. section 2.1 and Hoekstra and Hyams 1998 for discussion of the modal properties of the infinitival morpheme).

(30)



Given the locality condition on licensing, i.e. Attract, the irrealis feature in INF can license Mood only if T/AGR and ASP are underspecified. Three consequences follow: First, we predict the basic properties of RIs, viz. an underspecification of T/AGR and modal interpretation. Second, given that ASP must be underspecified as well, we do not expect to find RIs containing aspectual auxiliaries. As is well known, examples such as those in (31) are unattested in languages with an otherwise robust RI stage, e.g. French (Ferdinand 1996), Dutch (de Hann 1986) and German (Poeppel and Wexler 1993)[23]

[23] In Hyams (2002) this issue is discussed in more detail. I also consider the implications of this analysis for non-finite forms in early English and Russian, the basic properties of which also follow from the analysis presented in this paper.

(@ indicates an unattested utterance type)

(31) a. @Maman avoir mang— glace (French)
Mommy have-inf eaten icecream
b. @ De pop zijn gevallen (Dutch)
the doll be-inf. fallen

Finally, in line with our earlier prediction for Greek, we expect that the RIs will decline as true modals become productive, since the licensing function of the irrealis feature of the infinitive will be supplanted by the merged modals. According to Wijnen (1994) there is similar trade-off in Dutch; the proportion of RIs decreases as the proportion of modals increase. Wijnen was not, however, specifically investigating the acquisition of modals, and hence a more detailed investigation into the acquisition of modals in the RI languages is in order.

4.4. Some further considerations

At a descriptive level we have accounted for the basic properties of non-finite root clauses in Greek and in the RI languages, as well as differences between the adult and child grammars with respect to the licensing of MoodP. But we have not yet addressed a central issue raised by bare perfectives (and RIs), namely, does the early grammar differ in some fundamental respect from the adult grammar or can we maintain our assumption of continuity? Several considerations come into play in answering this question. Ideally, we would like to reduce the adult-child differences solely to the lack of modals in the early grammar, rather than to also posit different grammars. Since we know that modals have to be acquired, it would be desirable if the grammatical differences were a deductive consequence of the lexical differences. Thus, the first issue to address is whether the licensing of Mood by lower functional features is uniquely a property of child grammar or do we find similar effects in adult grammar. If we can find similar effects in some corner of the adult grammar, then this would support the continuity assumption.

A related question concerns the optionality of underspecification of T/AGR. We return to this issue below.

We have seen that in the adult grammar past tense can give rise to a modal meaning, as in counterfactual conditionals and wishes. In the child's grammar the underspecification of T/AGR allows Mood to find its matching feature in ASP or INF. Does a similar possibility arise in adult grammar? The negative imperatives, discussed by Zanuttini, may be such a case. Here, infinitival or subjunctive features on the verb can license Mood because – following Zanuttini's 1997 and Kayne's 1994) hypothesis -- imperatives have a defective tense specification.[24]

The jussive construction, illustrated in (2b) and repeated below, is another example in the adult grammar (Dutch, in this case) of an active Mood licensed by a infinitival verb.

(32) Hier geen fietsen platsen
'No bicycle parking here'

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[24] A potential problem for this idea is that suppletive imperatives also include forms with person agreement as in (i) and (ii):

(i) Andate via!
go-2nd.per. plu. away
(ii) Andiamo via!
go-1st per.plu. away
let's go'

If agreement features are part of the T projection (as proposed in Chomsky 1995), it is not obvious how T can be underspecified in imperatives. Alternatively, we might assume that Tense and Agreement features can be independently underspecified (cf. Schütze and Wexler1996). Under these assumptions, Mood would licensed by Agr features in (i) and (ii) though tense features are absent. In RIs and bare subjunctives T/AGR is fully underspecified making Asp an accessible licenser.

Thus, the licensing mechanism that we have proposed for early grammar seems to show up in adult grammar as well, though in more restricted contexts.

This brings us to the second issue, which concerns optionality. Is it the case that children have underspecification as a true grammatical option (as proposed, for example, in Wexler (1994)), in contrast to adults for whom underspecification is only a restricted possibility? The results presented here argue against this position. As we have seen, in early Greek agreement is fully productive and correct with 1st and 2nd person subjects and with imperfective verbs (cf. tables 4 and 5). In the RI languages as well, agreement on finite verbs is correct in the vast majority of cases (e.g. Clahsen and Penke 1992. cf. table 1.). Thus, the underspecification of T/AGR in these languages is associated specifically with modal meaning, or in other words, with an active MoodP, and it is not simply a free grammatical option. This result is in line with much current work on adult grammar showing that grammatical operations are triggered by syntactic features and that there is no true optionality. The availability of bare perfectives and RIs in early grammar is thus plausibly related to the lack of modals and not to any specific difference between adult and child grammars.

The parallelism between the adult and child grammar is highlighted by the non-modal sentences. For children, as for adults, when the verb is temporally anchored, for example [+past] as in (33), the perfective feature can only be interpreted aspectually. It has no modal option. The sentence in (33a) is an adult sentence; the sentence in (33b) is a child sentence (from Stephany 1981).

(33) a. O Nikos espasse to podilat✱ tou sto p·rko
The Nikos break-past. perf.-3 s the bike his in-the park
'Nikos broke his bike in the park'.

b. It·ki t·vala (= sto spit·ki t✳vala)
(into the) little house (I) it put- past. perf.
'I put it into the little house'

If Tense is specified, then by Attract, the aspectual features are not accessible to Mood. Thus, in a tensed clause, the aspectual feature must be interpreted aspectually in both the child and the adult grammars, as in (33).

In Hyams (2001a,b) I observed that the morphosyntactic opposition between finite verbs and RIs in the RI languages corresponds to a semantic opposition between realis and irrealis mood. I expressed this generalization in the form of a 'semantic opposition hypothesis', as in (34).

(34) *Semantic Opposition Hypothesis*

The (alternation between finite verbs and RIs during the) RI stage is the morphosyntactic expression of a semantic opposition between realis and irrealis mood.

I further proposed that among the various temporal and modal oppositions, realis vs. irrealis mood represents a primitive -- perhaps the most primitive -- opposition that children represent grammatically.[25] The Greek results are quite in line with the semantic opposition hypothesis. As first observed by Stephany (1981, 1986) and Katis (1984) in early Greek the realis-irrealis opposition is expressed through an aspectual opposition between perfective and imperfective verbs.

We are now in a position to understand the complementarity between tense and

[25] Wagner (1998) presents experimental results that are consistent with this hypothesis. Wagner tested English- speaking children on their interpretation of tense and aspect and found that children understood the future (irrealis) - non-future (realis) contrast significantly earlier than the past-non-past contrast.

modality in early grammar suggested by the semantic opposition hypothesis. This follows from the fact that aspectual features can be associated with either mood or aspect, but not both. In the adult grammar, in contrast, it is possible to have an aspectually construed modal clause, as in (17), because the modals (*na* or *2a*) license Mood, allowing the tense and aspect features to do the temporal job. Thus, the inverse relationship between temporality and modality in early grammar seems to be directly related to the unavailability of modals in the early stage.

4.0. Concluding remarks

VVR present an extremely interesting range of data from early Greek, as well as a provocative analysis. Upon scrutiny, however, the data are largely incompatible with the hypothesis of a prefunctional grammar stage. Children acquiring Greek, like children acquiring many other languages that have been studied, show a early convergence on the morphosyntax of the adult language, in particular the agreement system. We have been principally concerned with the interpretive properties of inflectional categories and their interaction, especially as regards what we refer to as the 'bare perfective'. VVR analyze the bare perfective as the Greek analogue of the root infinitive found in other child languages. We have argued that bare perfectives share a fundamental property with root infinitives -- a modal or irrealis interpretation. However, the meaning of the bare perfective renders implausible VVR's participle analysis, as well as the attendant minimal projection markedness hierarchy. We have proposed, instead, an analysis in which the modal interpretation is tied to an active MoodP - both in the adult grammar and the child grammar. Thus, in addition to the morphosyntax (e.g. productive agreement), the interpretive facts support our claim that children have higher functional structure. On our analysis, the child's system adheres to universal grammatical principles and thus differs

minimally from the adult's. We have proposed that the difference turns on the availability of modal particles (or modals) to license MoodP. The locality condition on feature checking (Attract) accounts for the underspecification of functional features in the bare perfective. Thus, the child does not rely on extra-grammatical or special developmental mechanisms to license the bare perfective. This analysis extends straightforwardly to the root infinitive phenomenon found in other child languages.

Over the past 20 years or so we have learned a great deal about the development of morphosyntax in the young children. We know far less about their semantic development, and even less about the interface of morphosyntax and semantics during the course of language development. Tense, aspect and mood are fundamental categories in human language. It is thus important for acquisition theory to uncover how these categories develop and interact in the child's development of grammar.

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