

Eventivity effects in early grammar: The case of non-finite verbs

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Abstract

During the Root Infinitive (RI) stage children produce both stative and eventive finite verbs, but their non-finite verbs are restricted to eventive predicates (Hoekstra & Hyams, 1998; Wijnen, 1997). This Eventivity Constraint (EC) holds cross-linguistically – for RIs in Dutch, German, French, and Russian, ‘bare perfectives’ in Greek, bare participles (participles without an auxiliary) in Italian, French, and German – but not for English bare verbs. Hyams (2007) proposes the ‘aspectual anchoring hypothesis’ (AAH), which requires that non-finite root clauses be temporally anchored via the aspectual system. This article demonstrates that without any additional stipulations the AAH also accounts for the EC and the lack of such an effect in English bare verbs.

Keywords

aspect, bare verb, cross-linguistic, eventivity, modal, participles, root infinitives

1. Introduction

Beginning with de Haan (1987), various people have observed a relationship between finiteness and eventivity in early grammar (see also Becker, 2000; Ferdinand, 1996; Hoekstra & Hyams, 1998; Jordens, 1990; Wijnen, 1997). The simplest generalization, formulated in Wijnen (1997) and Hoekstra and Hyams (1998), is that root infinitives (RIs) are restricted to event-denoting predicates while finite verbs occurring at the same time may be eventive or stative.

It turns out that this simple generalization is too narrow. While it is true that RIs (1a) are restricted to eventive predicates, it is also true that other non-finite forms are similarly restricted. Bare participles (participles without an auxiliary in, for example,

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Italian, French and German) (1b) are eventive (in fact, they are mainly telic; Antinucci & Miller, 1976; Bittner, 2003). Greek 'bare perfectives' (1c) are also restricted to eventive predicates (Stephany, personal communication, and 1981, 1985). Interestingly, bare verbs in English (1d) are not restricted to eventive predicates:

- (1) a. Niekje buiten spelen.
Niekje outside play-INF.
'Niek wants to play outside.'
- b. Papa comprato tanti giocattoli.
daddy bought-part. lots of toys
'Daddy has bought lots of toys.'
- c. Pio vavási (child form of *ðiavási*)
Spiros read-PRF.3SG
'Spiro is going to/wants to read.'
- d. Becky have puzzle.

Putting English aside for a moment, we can state the Eventivity Constraint (EC) as in (2):

- (2) *Eventivity Constraint (EC)*
RIs and other non-finite root verbs are restricted to event-denoting predicates.

In Hoekstra and Hyams (1998) the EC is connected to the 'modal reference effect' (MRE), which is the modal reading often associated with RIs in languages like Dutch, and to the morphology of RI languages. This analysis accounted for the presence of the EC and the MRE in Dutch/German and other languages and the absence of both these effects in English. However, as I discuss in this article, the predictions of this analysis do not stand up when tested against a wider range of languages.

In Hyams (2007) an alternative analysis is offered of the modal reference of RIs and other temporal meanings, based on the aspectual anchoring hypothesis, given in (3):

- (3) *Aspectual anchoring hypothesis (AAH)*
In the absence of a tense specification, the temporal meaning of a sentence is given by its aspectual properties.

The thrust of AAH is that universal principles of aspectual interpretation, for example the punctuality constraint (Giorgi & Pianesi, 1997), interact with the specific aspectual properties of the target language to determine the possible meanings (past, present, modal) of the different non-finite forms used by children in several typologically diverse child languages, including Dutch, German, Russian, Greek, Italian, and English.

In this article, I show that without any additional stipulations, the AAH also accounts for the EC and the lack of such an effect in English bare verbs. I begin in section 2 by discussing the empirical evidence from a variety of languages showing an EC. In section 3, I review the Hoekstra and Hyams (1998) modal reference account of the EC, and also an alternative, 'denotational hypothesis' (Wijnen, 1997). Both the modal reference and the denotational analyses offer some insight into the effects of eventivity, but at the same

time, neither is able to account for the full range of empirical data. In section 4, I review the AAH and in section 5, I propose an account of the EC based on aspectual anchoring that incorporates insights of the modal reference and denotational accounts, but which I believe avoids the pitfalls. Finally, in section 6, I discuss the well-known aspectual restriction in English that eventive verbs cannot denote ongoing events (**John plays now*). I show that data from the child's bare verb stage provide insight into this aspectual restriction.

2. Eventivity effects in various languages

I begin by briefly reviewing the aspect terminology adopted in this article.

Verbs have been traditionally classified in terms of their inherent temporal properties. The following four classes are due to Vendler (1957/1967): states are non-dynamic and unbounded predicates, e.g., *love, resemble, believe, have, be dead, be sick, know*. Accomplishments are predicates that encode temporally extended (non-instantaneous) changes leading to an end, e.g., *melt, freeze, dry, learn*, also referred to as 'non-punctual' events. Achievements are predicates that encode instantaneous changes, also referred to as 'punctual' events, usually changes in state but also changes in activities, e.g., *explode, collapse, shatter*. Activities are dynamic and temporally unbounded predicates, e.g., *dance, run, swim, think*.¹ Telicity refers to whether the verb has an inherent endpoint. Thus, accomplishment and achievement predicates are telic while states and activities are atelic. Another classification is a simple division into stative vs. eventive predicates. Eventive predicates are dynamic and include Vendler's accomplishments, achievements, and activities.

With this brief background in mind, let us review the evidence for the EC in various child languages. I restrict my attention to those languages in which the phenomenon has been most systematically studied – Dutch, German, Russian, Greek, and English.

2.1 Dutch

Wijnen (1997, 1998) was the first large-scale quantitative study of eventivity effects in RIs. Of the verbs typically used by the children in his study, Wijnen (1998) classifies the following as stative, all others as eventive:²

- (4) Stative verbs: *hebben* (have), *zijn* (locative be), *zien* (see), *passen* (fit).

Some of the eventive verbs used by the children's are *spelen* (play), *kopen* (buy), *bouwen* (build), illustrated in the examples below:

- (5) a. Niek buiten spelen.
Niekje outside play-INF
'Niek wants to play outside.'
b. Eerst kaartje kopen.
First ticket buy-INF
'First buy the ticket!'

- c. Papa bouwen.
 Daddy build-INF
 ‘(I want) Daddy to build/Daddy must build.’

The quantitative results of Wijnen’s study are reported in Table 1, based on four Dutch-speaking children.³

We see a clear effect of eventivity in these data: RIs are overwhelmingly eventive (95%) while finite verbs are evenly split between eventive and stative verbs.⁴

Blom (2003) also investigates eventivity effects in Dutch RIs. She looked at six children, three of whom are also in Wijnen’s study.⁵ Like Wijnen, she finds a strong eventivity effect: the percentage of stative RIs range from 4% to 18% depending on the child, while the percentage of finite stative verbs ranges from 42% to 63%.⁶

2.2 German

The EC is not restricted to Dutch. Becker and Hyams (2000) report an eventivity restriction in the six German-speaking children they studied.⁷ These results are given in Table 2.

For five of the six children the percentage of eventive RIs is between 95% and 100%, while approximately one-half of finite verbs are stative.⁸ Lasser (1997) also observes an

Table 1. Number and percentage of eventive/stative predicates in Dutch finite clauses and RI

| Child | RI | | Finite | |
|--------------|------------|---------|-----------|-----------|
| | Eventive | Stative | Eventive | Stative |
| Josse | 272 (95%) | 14 (5%) | 48 (45%) | 58 (55%) |
| Matthijs | 677 (97%) | 24 (3%) | 124 (43%) | 166 (57%) |
| Niek | 348 (96%) | 15 (4%) | 120 (56%) | 94 (44%) |
| Peter | 498 (93%) | 40 (7%) | 57 (63%) | 32 (36%) |
| Total (mean) | 1795 (95%) | 93 (5%) | 349 (50%) | 350 (50%) |

Table 2. Number and percentage of eventive/stative predicates in German finite clauses and RIs

| Child | RI | | Finite | |
|---------------|-----------|---------|------------|------------|
| | Eventive | Stative | Eventive | Stative |
| Julia 2;2–2;5 | 57 (100%) | 0 (0%) | 12 (25.5%) | 35 (75.4%) |
| Andreas 2;1 | 192 (95%) | 10 (5%) | 94 (41%) | 136 (59%) |
| Wolfgang 2;5 | 25 (100%) | 0 (0%) | 36 (66.7%) | 18 (33%) |
| Johanna 2;5 | 6 (46%) | 7 (54%) | 9 (64%) | 5 (36%) |
| Sophie 2;5 | 5 (100%) | 0 (0%) | 19 (73%) | 7 (27%) |
| Philip 2;9 | 16 (100%) | 0 (0%) | 9 (64%) | 5 (36%) |
| Total (mean) | 301 (95%) | 17 (5%) | 179 (46%) | 206 (54%) |

eventivity effect in her German-speaking children, though she does not provide quantitative data on this issue.

2.3 French

That Dutch and German behave similarly is not surprising, but the EC extends beyond the Germanic V2 languages. Ferdinand (1996) finds an eventivity restriction in four French-speaking children.⁹ Her children alternate finite and non-finite verbs, as is typical during this stage. The non-finite forms include both RIs and bare participles and as in Dutch and German, they are always eventive verbs. The children do use stative verbs, including *avoir* (have), *être* (be), *s'appeler* (be called), *manquer* (be absent, lack), *vouloir* (want), *croire* (believe), *plaire* (please), *aimer* (love), *adorer* (adore), *espérer* (hope), *savoir* (know), *se souvenir* (remember), *devoir* (must), *falloir* (be necessary), *pouvoir* (can), aspectual *aller* (go), and these are always finite during the period under investigation.¹⁰

Labelle (2000) analyzes the non-finite forms (RIs and bare participles) of another French-speaking child, Melani, between the age of 1;7 and 1;9 and confirms Ferdinand's finding for French, that these non-finite forms are always eventive. Similarly, Meisel's (1985) study of three German–French bilingual children shows an EC in both languages.

2.4 Russian

Russian also obeys the EC. Table 3, from Brun and Babyonyshev (2003), shows the strength of the effect, only 5% of RIs are stative, as compared to 26% of finite verbs.

Van Gelderen and van der Meulen (1998) report similar results for Varvara; 98% of her RIs are eventive.¹¹

2.5 Greek

Greek child language does not show an RI stage per se because Greek does not have an infinitival form. However, Greek children go through a period in which they use an arguably non-finite form. Elsewhere I refer to this form as the 'bare perfective' because it is a perfective form of the verb that neither has past tense morphology nor is supported by a modal particle, one or the other of which would be required in the adult language

Table 3. Number and percentage of eventive/stative predicates in Russian finite clauses and RIs

| Child | RI | | Finite | |
|------------------|-----------|---------|-----------|----------|
| | Eventive | Stative | Eventive | Stative |
| Sasha J. 2;4–2;8 | 44 (94%) | 3 (6%) | 98 (79%) | 26 (21%) |
| Sasha P. 1;6–2;5 | 85 (96%) | 4 (4%) | 167 (80%) | 41 (20%) |
| Total (mean) | 129 (95%) | 7 (5%) | 265 (79%) | 67 (21%) |

Table 4. Number and percentage of eventive/stative predicates in Greek finite clauses and bare perfectives

| Child | Bare perfectives | | Finite verbs | |
|------------|------------------|---------|--------------|----------|
| | Eventive | Stative | Eventive | Stative |
| Spiros 1;9 | 69 (100%) | 0 (0%) | 46 (61%) | 29 (39%) |
| Janna 1;11 | 143 (100%) | 0 (0%) | 138 (72%) | 53 (27%) |
| Total | 212 (100%) | 0 (0%) | 184 (69%) | 82 (31%) |

(Hyams, 2003, 2005; Varlokosta, Vainikka, & Rohrbacher, 1998). The bare perfective is illustrated in (6):

- (6) a. Pio vavási. (child form of *diavási*)
Spiros read-PRF.3SG
'Spiro is going to/wants to read.'
- b. Pári yugunáki?
Take-PRF.3SG the piggy
'May I take the piggy?'
- c. Xalási toa.
break-PRF:3SG
'It is going to break.'

Stephany (personal communication) provides figures on the aspect of bare perfectives and finite verbs for two Greek-speaking children in the 'RI stage' (see also Stephany, 1981, 1985).¹² As shown in Table 4, bare perfectives are 100% eventive while approximately one-third of finite verbs are stative.

Under the hypothesis that the bare perfective is a root non-finite form – an RI analogue, Greek provides further support for the EC. The Greek findings also show that the restriction to eventive aspect is not linked to a specific morphology, viz. the infinitive. As I discuss in the next section, this is one argument against the account of the EC proposed in Hoekstra and Hyams (1998), which relates the EC to the presence of an infinitival (irrealis) morpheme.

2.6 English

I turn finally to English, whose behavior is directly at odds with the EC. Hoekstra and Hyams (1998) note that statives figure prominently among the bare forms produced by English-speaking children. This generalization was initially based on an analysis of the early files of Adam and Eve (Deen, 1997) and then later confirmed in the corpora of Nina, Naomi, and Sarah (Madsen & Gilkerson, 1999; Torrence & Hyams, 2004). Some examples of English bare statives are provided in (7) and quantitative data are provided in Table 5:¹³

- (7) a. Becky have puzzle.
b. The baby want a bottle.
c. Ann need Mommy napkin.

Table 5. Number and percentage of eventive/stative predicates in English finite and bare verb clauses

| Child | Bare verbs | | Finite verbs | |
|-------|------------|-----------|--------------|-----------|
| | Eventive | Stative | Eventive | Stative |
| Adam | 139 (74%) | 50 (26%) | 69 (92%) | 6 (8%) |
| Eve | 60 (80%) | 15 (20%) | 12 (86%) | 2 (14%) |
| Sarah | 33 (63%) | 19 (37%) | 29 (71%) | 11 (28%) |
| Nina | 73 (62%) | 45 (38%) | 106 (64%) | 60 (36%) |
| Naomi | 25 (71%) | 10 (29%) | 87 (55%) | 70 (45%) |
| Total | 330 (70%) | 139 (30%) | 303 (67%) | 149 (33%) |

Table 5 shows that on average 30% of English bare verbs are stative. This is substantially higher than the percentages we find in the other languages. In fact, the percentage of bare statives in English is only slightly lower than the percentage of finite statives (33%). The EC does not appear to operate in early English.¹⁴

Summing up thus far, the cross-linguistic data clearly show that RIs and other non-finite forms, such as the Greek bare perfective, are aspectually restricted, occurring almost exclusively with eventive predicates. It is not the case that children fail to produce statives early on. Rather, their statives are basically limited in distribution to finite contexts. English represents an exception to the otherwise robust EC.

3. Previous account of the EC

There have been two general approaches to the EC, which I discuss in this section. I refer to these as the modal reference hypothesis and the denotational hypothesis.

3.1 The modal reference hypothesis

In Hoekstra and Hyams (1998), it is proposed that the EC derives from the modal reference associated with RIs in many (child) languages. Two specific claims are made: (i) that the infinitival morpheme in languages with true morphological infinitives, such as Dutch (*spelen* ‘play’), German (*eten* ‘eat’), French (*dormir* ‘sleep’) among others, is associated with an irrealis or deontic modal feature (Duffley, 1992; Stowell, 1982), and (ii) that this modal feature selects an eventive predicate (Barbiers, 1995). Stative RIs are thus excluded in languages with true morphological infinitives. This account can be schematized as in (8) (EN refers to infinitival morphology):

$$(8) \text{ EN} \rightarrow \text{MRE} \rightarrow \text{EC}$$

This proposal rests on the observation of a strong interaction between aspect and modality, and more specifically, that the most easily accessible modality with eventive predicates is deontic while statives are most compatible with epistemic modality, as discussed in Barbiers (1995) (see also McDowell, 1987; Steedman, 1977).¹⁵ This is illustrated most straightforwardly with the modal ‘must’, as in (9):

- (9) a. John must leave immediately. (deontic)
 b. John must need help. (epistemic)
 c. John must know the answer. (epistemic/deontic with inchoative meaning)

In sentence (9a), the verb *leave* is eventive and the most natural construal of the modal is deontic, expressing that it is necessary that John leave immediately. In (9b) the verb *need* is stative and the most natural construal of the modal is epistemic, i.e., according to the available evidence it must be the case that John is in need of help. Stative verbs are possible under deontic modals, as in (9c), but in this case the stative takes on an inchoative, i.e., eventive, meaning roughly John must come to know/learn/find out the answer. The semantic association between eventivity and deontic modality, coupled with the familiar observation that young children only have deontic modality (see Becker & Hyams, 2000; Blom, 2003; Ferdinand, 1996; Papafragou, 2000; Stephany, 1986, among others), entails that their RIs will be restricted to eventive predicates.

To sum up, the modal reference hypothesis predicts that in languages with true infinitival morphology, such as Dutch, German, and French, RIs will have modal meaning and also obey the EC.¹⁶ Conversely, neither effect will hold for English: bare verbs lack infinitival morphology, hence there is no source for modal reference and consequently no selection with respect to eventivity under the hypothesis schematized in (8).

Although the modal reference analysis seems to capture the split between true RI languages, such as Dutch, vs. English, a bare verb language, it ultimately fails as a general account of the aspectual properties of RIs and related phenomena in other child languages. For example, Russian RIs are true morphological infinitives, but they are not overwhelmingly modal in interpretation. Rather, Russian RIs can have past, present, or modal meaning (Brun & Babyonyshev, 2006). On the other hand, the Greek bare perfective has the same deontic modal meanings as Dutch RIs and yet it is not an infinitival form. So the association between morphology and modality hypothesized by Hoekstra and Hyams fails in both directions. Also, Russian RIs are restricted to eventive predicates despite the fact that they have the range of temporal interpretations just noted (Brun & Babyonyshev, 2006). So the relationship between modality and eventivity postulated by Hoekstra and Hyams (1998) also fails.

Ferdinand (1996) also proposes a modal reference analysis of the EC. Her account postulates that RIs contain a null deontic modal that selects an eventive predicate. Ferdinand's null modal account of RIs, based on Boser, Lust, Santelmann, and Whitman's (1992) null aux hypothesis, is also problematic in several respects. First, this hypothesis fails to account for the absence of a modal reference effect in English bare verbs. As illustrated in (10a), bare verbs are selected by modals just as infinitives are selected by modals in Dutch, etc., illustrated in (10b), and there is therefore no reason why the English bare verb construction should not also contain a null modal. Yet, English bare verbs virtually never have modal meaning, a point we return to later:

- (10) a. John must sleep.
 b. Jan moet slapen.
 'John must sleep-inf.'

The central problem with the null modal hypothesis is that it conflates two assumptions. The first is that there is a null modal in the structure of RIs, the second that the structure is otherwise identical to the adult sentence with an overt modal, in particular that it is finite (Boser et al., 1992). This second assumption obliterates the morphosyntactic distinction between finite utterances and RIs. In doing so, it fails to capture those properties that are dependent on finiteness and which are missing in RIs, outlined in (11):¹⁷

- (11) (i) RIs do not occur in *wh* questions (Crisma, 1992; Haegeman, 1994; Kursawe, 1994) (cf. **Wat Papa doen?* ‘what papa do-inf?’).
- (ii) RIs do not occur with non-subject topics (in the V2 languages) (Haegeman, 1994; Platzack, 1992; Poeppel & Wexler, 1993; Verrips & Weissenborn, 1992).
- (iii) RIs occur overwhelmingly with null subjects while finite clauses usually have overt subjects (Behrens, 1993; Haegeman, 1994; Krämer, 1993).
- (iv) RIs do not occur with subject clitics (in French) (cf. **Je dormir* ‘I-sleep-inf.’) (Pierce, 1992).

In the account that I propose in this article, based on the AAH, I adopt elements of the null modal analysis, but I reject the finiteness assumption.¹⁸

3.2 The denotational hypothesis

A second approach to the EC is the denotational hypothesis. Kratzer (1989) and others have argued that events, but not states, have an event argument. In line with this proposal, Wijnen (1997) suggests that in early grammar the event variable can be deictically interpreted, i.e., not bound to a tense operator as required in adult grammar. Tense can therefore be omitted because the event variable allows for a contextual interpretation of event time. Statives lack an event variable (according to Kratzer, 1989) and hence do not have a deictic option. They must have a tense specification to be temporally interpreted.¹⁹

The denotational approach has a lot of appeal. It captures the eventive/stative split and it fits well with the intuition that child language is more context/discourse dependent than adult language. However, a problem for the denotational approach is that in languages such as Dutch, German, Swedish, and French, the majority of RIs have a modal or irrealis interpretation and thus strictly speaking, do not refer to any event. Rather, they express a desire, intention, or need with respect to some eventuality. Russian also has a significant number of modal RIs and the Greek bare perfective is almost exclusively modal. The modal reference facts are discussed shortly. Without some further elaboration, the denotational hypothesis does not offer any explanation for the modal reference of RIs or of the variation that different child languages show with respect to the referential possibilities of non-finite verbs.²⁰ A further weakness of the denotational approach is that it does not explain why English does not obey the EC. Like the other languages discussed, stative verbs in English also lack an event argument, and should not therefore occur as bare verbs, contrary to fact.²¹

Table 6. Temporal and modal characteristics of non-finite eventive clauses in child language

| | Present | Past | Modal/future |
|---------|---------|------------|----------------------|
| English | 65% | 25% | 8% ins. ^a |
| Russian | 26% | 48% | 26% |
| Greek | ins. | ins. | Approx. 100% |
| Dutch | 10–26% | 1%–3% n.s. | 73%–86% |

^ains. (insignificant) < 10% across children.

Despite these limitations, both the denotational and modal references accounts offer insights into the eventivity issue. In the following I propose an account of the EC which incorporates elements of both these accounts, but which avoids the problems associated with both, in particular the problems raised by the finiteness assumption.²²

4. The aspectual anchoring hypothesis

The analysis I propose to account for the eventivity effects discussed in the preceding sections relies crucially on the aspectual anchoring hypothesis (Hyams, 2007), originally proposed to account for the different temporal and modal meanings associated with non-finite forms across different child languages. Therefore, in this section I first review the AAH and then return to the eventivity constraint in light of this hypothesis.

4.1 Modality and aspect in early non-finite forms

A thorough examination of the temporal and modal meanings of early RIs and other non-finite forms, such as the English bare verb and the Greek bare perfective, shows a complex pattern. For ease of exposition I present the basic interpretive facts in Table 6. In the interest of space the table displays aggregate data from several children.²³

Looking first at English, bare verbs are mainly past or present in reference. Examples are provided in (12). In accordance with general norms that allow for 10% noise in spontaneous speech (e.g., Brown, 1973), I treat the 8% of bare verbs with modal meaning as noise in the data.

- (12) a. Child: He fall down. (Sarah, file 40)
 Mother: He did?
- b. Mother: What's she doing with the tiger now?
 Child: Play # play ball with him. (Nina, file 39)

A further fact about English, which is not reflected in Table 6, is that the temporal reference of the bare verb is strongly contingent on the telicity of the predicate (Torrence & Hyams, 2004): telic verbs typically denote past events (as in 12a) while atelic verbs almost always express present tense events (as in 12b). This contingency is shown in Table 7.^{24,25}

Table 7. Temporal reference and (a)telicity in English bare verbs

| Interpretation | Bare verbs Aspect | |
|----------------|-------------------|----------|
| | Telic | Atelic |
| Past | 48 (94%) | 9 (6%) |
| Present | 16 (15%) | 88 (85%) |

Table 8. (Im)perfectivity and temporal reference in Russian RIs

| Interpretation | Root infinitives | |
|----------------|------------------|--------------|
| | Perfective | Imperfective |
| Past | 67 (94.6%) | 4 (5.4%) |
| Present | 2 (1.7%) | 36 (98.3%) |
| Future/modal | 40 (53%) | 36 (47%) |

Turning to Russian, Dina Brun (personal communication) reports that Russian RIs have temporal and modal meanings in the proportions given in Table 6. Examples are provided in (13) (from Brun, 1999):

- (13) a. Mama maslo kupit'. (past)
 mommy butter-buy-INF
 'Mommy has bought the butter.'
- b. Kupat'sya. (present)
 bath-INF
 '(He) is bathing.'
- c. Rubaška snimat'. (modal/future)
 shirt take-off-INF
 '(I will/want to) take off the shirt.'

Russian verbs are marked for grammatical aspect, either perfective or imperfective. Brun, Avrutin, and Babyonyshev (1999) show that in Russian RIs perfectivity correlates with temporal reference. In this respect the Russian RI data are very similar to the English bare verb data. As shown in Table 8 (from Brun et al., 1999), perfective verbs occur overwhelmingly in past tense contexts while imperfective verbs always occur in present contexts.

Turning to Greek, the 'bare perfective' is overwhelmingly modal in meaning (about 100%), expressing wishes, intentions, obligations (Stephany, 1995, among others) parallel to the modal meaning associated with RIs (see Hyams, 2005; Varlokosta, 2002). Finally, Dutch RIs, illustrated in (5), have predominantly a modal meaning (between 73% and 86% depending on the study) with some 10%–26% of verbs referring to ongoing events. As noted in Table 6, fewer than 4% of Dutch RIs have past reference and

according to the criteria mentioned earlier I ignore these as noise. Similar results have been reported for German (Behrens, 1993; Lasser, 1997).

4.2 Deriving the interpretations

In Hyams (2007) the interpretive differences shown in Tables 6–8 are analyzed through a system of aspectual anchoring. This system is based on general principles of aspectual interpretation in interaction with specific lexical and grammatical aspectual properties of the target languages. In the following section I show that the EC (and lack thereof in English) also falls out from the aspectual anchoring hypothesis without any additional stipulation. To do this I first review how the aspectual anchoring system handles temporal interpretations of non-finite clauses.

The essence of the AAH is that in the absence of finiteness the temporal meaning of the clause is determined by the event/aspectual structure of the predicate, by the property of event closure, or more precisely, the opposition between a closed and open event in the sense of Giorgi and Pianesi (1997). Within this framework, imperfective and atelic verbs denote non-closed or *open* events and perfective and telic verbs denote *closed* events, as noted in (14):

- (14) Perfective/telic → closed event
Imperfective/atelic → open event

There are several general principles that I assume, which seem fairly uncontroversial. The first is that to be interpreted events must be assigned a temporal reference, as in (15):

- (15) *Temporal Anchoring Requirement (TAR)*²⁶
Events must be temporally interpreted, that is, they must be ordered with respect to a reference time (which, following Stowell, 1982, 1997, and others, I take to be utterance time [UT]).


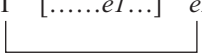

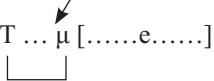
Further, I assume the Default Anchoring Requirement (DAR), as in (16), which says that in the absence of a tense specification, there is a default assignment of event time (ET) to utterance time (UT):

- (16) *Default Anchoring Requirement (DAR)*
In the absence of a tense specification, the event time coincides with the utterance time, $UT = ET$.

Finally, I follow Giorgi and Pianesi's punctuality constraint on the temporal anchoring of closed events, given in (17):

- (17) *The Punctuality Constraint (PC)* (Giorgi & Pianesi, 1997)
A closed event cannot be simultaneous with the utterance time (UT).

The assumptions in (15) through (17) lead to a rather restricted set of temporal options in the early grammar. These options are given in the schemas in (18):

- (18) a. UT.....e..... present ongoing reference

- b. UT [...e1...] e2 past reference

- c. UT [...e1...]

- d. UT ... μ [...e.....] modal reference


Events are either open or closed. In the case of an ‘open’ predicate (= imperfective or atelic) the event variable links to UT (by default anchoring) rendering an ongoing interpretation, as represented in (18a). If the event is ‘closed’ (represented by the brackets around the event variable), there are two options corresponding to (18b) and (18c). Following Higginbotham (2000), Pustejovsky (1995), Tenny (1994), I assume that a telic event, schematized in (18b), has two event variables, the first corresponding to the process and the second, the telos. If the event is closed by a second event variable, then *e1* (the process) is not accessible to UT (i.e., this anchoring is blocked by the punctuality constraint). However, default anchoring (DAR) requires a link to UT. This conflict can be resolved if UT is linked to the second event variable, the telos. This possibility is schematized in (18b). If UT is anchored to the telos, this entails that the processual part of the event, *e1*, leading up to the telos, is prior to the telos, hence past. So the past reading is derived as an entailment.²⁷

The second closure mechanism is direct closure by perfectivity, as in (18c). In this case there is no event variable in the structure that is accessible to UT. I propose that the structure is saved by the insertion of a null modal, symbolized by the Greek letter μ , which provides a link to UT, as schematized in (18d). In contrast to proposals by Ferdinand (1996), Boser et al. (1992) and others, I assume rather crucially that the null modal is *non-finite*.

The options schematized in (18) are those that are made available by general principles of aspectual interpretation such as the PC and the DAR. But how these options play out in a particular child language also depends on the aspectual system of that language. In what follows I briefly outline the effects for each of the languages we have reviewed in order to account for the distribution of temporal and modal meaning across the various languages in Table 6.

As a point of reference Table 9 again shows the four languages. The shaded cells show the possible readings, which will now be derived from the principles just outlined.

We begin with Russian. As noted previously, Russian RIs are either perfective or imperfective. Since imperfective verbs denote open events, default anchoring links the single event variable to UT and hence imperfectives have ongoing reference, as schematized in (18a). Perfective verbs denote closed events. There is considerable debate over the exact nature of Russian perfective affixes, whether they in fact encode perfectivity or telicity. A number of researchers, most recently Borer (2004), have argued that these affixes mark telicity (see Schoorlemmer, 1995; Verkuyl, 1999). I follow this hypothesis. Within the framework outlined here, this corresponds to the schema in (18b), in which

Table 9. Summary of possible event/temporal structures of non-finite verbs in different child language

| Temporal schema | Reference | Language | | | |
|-----------------|-----------|---------------|------------------------|-----------|--------------------|
| | | Russian RIs | Greek bare perfectives | Dutch RIs | English bare verbs |
| 18a | Present | imperfective | – | | atelic |
| 18b | Past | perfective | – | – | telic |
| 18c, → d | Modal | | | – | – |
| 18d | Modal | perf./imperf. | | | – |

the telos links to UT giving rise to a past reading. Alternatively, the structure can be anchored by a null modal as in (18d), which I assume to be a free option – and which yields the modal reading. The various options given in Table 6 for Russian are thereby derived. Note that Russian also has imperfective RIs with a modal reading, supporting the hypothesis that the null modal is available as a free option and not simply contingent on the failure of (18c).²⁸ This is also shown in Dutch, which I discuss shortly.

As I noted earlier, the assumption that Russian ‘perfective’ affixes induce telicity is not uncontroversial. The adult data are not entirely straightforward in this regard. I think this is a case in which the acquisition data may help to clarify the situation. The behavior of Russian RIs favors an analysis in which the affixes mark telicity. As we see shortly, early Greek, a language that also has perfective–imperfective verb pairs, behaves quite differently from Russian. The Greek bare perfective behaves like a perfective verb, not a telic one.

On that note, let us now turn to Greek and recall that the bare perfective has modal meaning virtually 100% of the time, as shown in Table 6. Why should this be? I propose that the Greek bare perfective has the temporal schema in (18c), that is, the perfectivity of the verb closes the event. As before, the punctuality constraint blocks a link between UT and the single event variable. So the only way to satisfy the anchoring requirement is through the insertion of a null modal, as in (18d).

We turn next to Dutch. It is often noted that Dutch verbs are aspectually neutral (see Boogaart, 1999; Giorgi & Pianesi, 1997). For example, the simple present in Dutch can denote either an ongoing or habitual event and the simple past is neutral between a perfective and imperfective reading, as illustrated in (19):

- (19) a. Jan eet een appel.
 ‘Jan eats/is eating an apple.’
 b. Jan at een appel.
 ‘John ate/was eating an apple.’

All the evidence suggests that the Dutch verb is neither overtly nor covertly marked for perfectivity. The lack of closure in the Dutch verb means that the closed event schemas (18b/c) are unavailable and we should therefore not find Dutch RIs with past tense reference, which is the case.²⁹ The second option for Dutch is the insertion of a null

modal, as in (18d), giving rise to modal RIs, the predominant reading in Dutch, as shown in Table 6. A similar analysis will hold for the German facts presented in Behrens (1993) and Lasser (1997).

Let me turn finally to the English bare verb. The strong contingency between telicity and temporal reference shown in Table 7 is explained as follows: atelic predicates denote open events, as illustrated in (18a). Accordingly, temporal interpretation is ongoing at UT. Telic bare verbs denote closed events; specifically, they are closed by a second event variable, *e*₂, as schematized in (18b) and the interpretation is therefore past.

4.3 Null *do*

Before returning to the eventivity issue, there is one final point to be clarified concerning English. We have seen that the modal insertion option (18d) shows up to varying degrees in Russian, Greek, and Dutch, but not with the English bare verb, which never has a modal reading. Why is this so? The answer I propose is that the modal option is in fact realized in English, but it is realized uniquely by a null *do* – symbolized by the Greek symbol Δ . This is the only English ‘modal’ that is compatible with a non-finite structure, as the ‘true’ English modals are inherently tensed (cf. *John hopes to be able/*can/*must/ to visit Prague.*). *Do*, on the other hand, has the desired properties; it has a non-finite form, viz. *do*; it is non-modal in meaning, and it is aspectually neutral, hence compatible with both telic and atelic verbs, as illustrated in (20):

- (20) John did (so) reach the top/dance.

The insertion of *do* provides an anchor to UT to satisfy the default anchoring requirement. I further assume that null *do* is replaced at LF by the verb to satisfy the principle of full interpretation (Chomsky, 1986, 1995) and thereby inherits the event structure from the verb, giving rise to the observed telicity effects.³⁰ The null *do* temporal structures are schematized in (21):

- (21) a. UT ... Δ ... e..... atelic
 └──┬──┘└──┬──┘
 b. UT ... Δ ... [...e1..] e2 telic
 └──┬──┘└──────────┘

The dual route available to bare verbs (direct anchoring to *e* and anchoring through Δ) may be responsible for some of the properties that distinguish the English bare verb structures from ‘true’ RIs. The availability of two possible derivations (21a/18a for atelics and 21a/18b for telics) may explain the higher frequency of bare verbs relative to RIs in other languages. For example, the rate of bare verbs for Adam, Eve, and Nina is 81%, 78%, and 75%, respectively while the RI rate in Dutch (German, and Icelandic), in contrast, falls between 26% and 40% depending on the child (see Hoekstra & Hyams, 1998; Phillips, 1996; Sano & Hyams, 1994). In addition, null *do* may explain why English does not adhere to the generalizations in (11i, iii), in contrast to other RI languages. A possible explanation for why English has non-finite *wh* questions, for example, *What teddy eat?*

(see 11i) is that null *do* carries the *wh* features that license the *wh* phrase, as per the *wh*-criterion (Rizzi, 1996). Also English may have a lower rate of null subjects with bare verbs (see 11iii) because null *do* governs subject position and thereby blocks PRO (which I take to be the null subject in non-finite root clauses) (Sano & Hyams, 1994).

Given the availability of null *do*, it is reasonable to ask if overt *do* is also licensed in non-finite contexts.³¹ I assume that null *do* is the null variant of the non-finite *do* hypothesized by Harris and Wexler (1996) and Schütze (2001) that occurs in negative contexts such as (22) providing the negative clitic (*n̄*) with a phonological host:³²

- (22) a. The hulk don't like chocolate.
b. He don't want some money.

We may assume that economy considerations prevent null *do* from being overtly realized unless a phonological specification is required by the grammar for independent reasons. A conjecture is that the overtness of *do* is determined by the different requirements of the two interfaces; *do* is overt to satisfy PF requirements, e.g., to host a clitic or inflectional affix, as in *do* support, but may remain null when satisfying LF requirements such as temporal anchoring.³³

Independent support for the null *do* analysis comes from a study of three English-speaking 2-year-olds by Tesan and Thornton (2004). They observe that bare verbs (null *do* contexts by our hypothesis) and 'non-agreeing *do*,' as in (22), occur during a period in which finite agreeing *do/does* (i.e., *do*-support), as in (23), is virtually absent:

- (23) He doesn't like pizza.

They also note that bare verbs as well as examples such as (22) drop dramatically once *do*-support becomes productive. The co-occurrence of overt, non-agreeing *do* and bare verbs and their parallel disappearance with the emergence of obligatory finiteness is consistent with our hypothesis that at least some bare verb structures contain a null *do*: once root tense becomes obligatory, *do*-support is required in the relevant contexts (when tense is 'stranded'), and non-agreeing *do* and bare verbs are no longer licensed.

5. The EC and aspectual anchoring

We are now set to return to the eventivity effects discussed at the beginning of the article.

I have proposed two options for deriving a temporal interpretation in the absence of tense. The first is linking to an event variable (18a, b) and the second, the insertion of a null modal (18d). Eventive verbs, depending on their aspectual structure, will be subject to one of these anchoring possibilities. Statives, on the other hand, cannot avail themselves of either of these options. According to Kratzer (1989), individual-level predicates (including statives) do not contain an event variable. Among her various arguments is the observation that stage-level predicates (eventive verbs, for our purposes) allow spatial and temporal modifiers (24a, b) and can also appear in *when* clauses (24c) (in which she assumes there is a covert 'always' operator). Statives do not allow such modification or operator binding (24d, e) or do so only on a stage-level reading:

- (24) a. Manon is dancing on the lawn.
 b. Manon is dancing this morning.
 c. When Mary speaks French, she speaks it well.
 d. *When Mary knows French, she knows it well.
 e. ??Manon knows French this morning/in France.

According to Kratzer, the modifiers and the ‘always’ operator relate to the verb via the event argument, and thus statives, which lack an event argument, are not possible.³⁴

The AAH requires that RIs (and other non-finite clauses) be anchored to UT in order to receive a temporal interpretation. The most direct means of anchoring is through an event variable, as in (18a, b). Following the logic of Kratzer’s approach, if statives have no event variable, then they cannot satisfy the anchoring requirement in this way. The essence of the denotational account of the EC (Avrutin, 1997; Wijnen, 1997) – that statives do not occur as RIs because they lack an event variable – follows without further stipulation from the AAH.

But what of the second option, insertion of a null modal? We have discussed the modal insertion option (18d) as a way for closed events to satisfy the DAR. But given the system developed thus far, there is nothing to block the insertion of a null modal in the stative case as well. This would have the untoward result of allowing stative RIs (with modal meaning), contrary to fact (but see note 16). How can this option be blocked? The modal reference hypothesis offers a way. We observed that the modality most compatible with stative predicates is epistemic (see 9). As noted earlier, young children (under age 5 or so) have deontic, but not epistemic modality, the latter being the modality most compatible with stative predicates. Thus, both mechanisms provided by the AAH for anchoring a non-finite clause – anchoring to an event variable and insertion of a deontic modal linked to utterance world – are unavailable to statives.³⁵ English, on the other hand, has the null *do* option. *Do* is aspectually neutral, as illustrated in (20) and (25), compatible with eventives and statives, and thus provides a possible anchor for statives, as in (26) (=21a), hence the lack of an EC in English:

- (25) a. John does so have a bicycle.
 b. John does so dance well.

- (26) a. UTΔ....e..... atelic (including statives)
 └──┘└──┘

In summary I am proposing that the denotational hypothesis and the null modal hypothesis are both correct in some sense. Both mechanisms are required to capture the eventivity effect and both fall out from the AAH. Previous denotational accounts (Avrutin, 1997; Wijnen, 1997) did not straightforwardly explain the modal reference effect because it is not obvious how a deictic reading of the event argument could give rise to modal meaning. This problem is avoided on the AAH because it is not an event variable that gives rise to the modal reading, but a null modal.

Earlier versions of the null modal hypothesis (e.g., Boser et al., 1992; Ferdinand, 1996), which assumed a finite null modal, failed to account for the clear differences between finite and non-finite clauses (see 11). An assumption of the present account is

that the null modal is non-finite. Thus, past/present RIs and modal RIs will exhibit the same range of morphosyntactic properties, differing only in their interpretation.

Note also that in contrast to the account proposed by Hoekstra and Hyams (1998) and also by Ferdinand (1996) under somewhat different assumptions, the eventivity of RIs is not directly or uniquely an effect of modal reference. Under the AAH the modality of RIs and the EC are derived independently, but within a unified system. Thus, the AAH also avoids the criticism of Brun and Babyonyshev (2003), who point out that the EC holds for all Russian RIs, not just those with modal meaning. Under the AAH, Russian RIs with present and past meaning are anchored through an event variable and modal RIs, through a null modal.

The absence of an EC in English bare verbs – which was not explained on the traditional null modal account – also follows directly from the AAH. As in other languages, English statives do not have the event variable option to anchor non-finite clauses. However, in contrast to the other languages discussed, English modals require finiteness (e.g., **I told John to should/may/etc. dance*). Therefore, there is no modal escape hatch for non-finite closed predicates in English, and hence no modal meaning associated with English bare verbs. The only non-finite modal-like element is null *do* (Δ). Like its overt counterpart, Δ is aspectually neutral and so compatible with *both* eventive (telic and atelic) and stative predicates.

In this section, I have shown that without further stipulations the AAH hypothesis, which accounts for the range of interpretive differences in non-finite clauses in different languages (Hyams, 2007), also accounts for the EC and its absence in English.

6. Aspectual properties of the English verb

Before concluding I would like to discuss a quirky property of the English verb that has direct implications for the anchoring analysis I have proposed.

As is well known, the English present tense verb cannot denote an ongoing event, but rather has only a property or habitual reading, as illustrated in (27a). We have seen, however, that the English-speaking child's bare verb can have a present ongoing reading. Example (11) is repeated for ease of exposition in (27b):

- (27) a. John plays a lot/**now*.
 b. Mother: What's she doing with the tiger now?
 Child: Play # play ball with him. (Nina, file 39)

To account for this particular property of adult English, Giorgi and Pianesi (1997) propose that eventive verbs in English are inherently perfective. That is, they denote closed events, and hence by the punctuality constraint (see 17), cannot be linked to UT. This is further illustrated by the behavior of verbs in perceptual reports. In (28a) the closure of the crossing event is included in the meaning of the verb in the small clause complement (John reaches the other side) and hence the interruption of the event is ungrammatical. This is to be contrasted with (28b) in which the progressive morphology cancels the closure.³⁶ The example in (28a) is interesting because it shows that the perfectivity feature is associated with the bare verb, independent of the tense specification. I return to this point below:

Table 10. Aspectual interpretation of non-past eventive verbs

| | Finite verb (–s) | | Bare verb | |
|--------------|------------------|----------|-----------|----------|
| | Ongoing | Habitual | Ongoing | Habitual |
| Nina | 0 | 21 | 26 | 7 |
| Naomi | 1 | 22 | 7 | 2 |
| Sarah | 0 | 10 | 5 | 5 |
| Total (mean) | 1 (2%) | 53 (98%) | 38 (73%) | 14 (27%) |

- (28) a. I saw John cross the street (*when he was hit by a car).
 b. I saw John crossing the street when he was hit by a car.

Despite this robust property of adult English, a substantial number of children's bare verbs (72%) have an ongoing interpretation, as shown in Table 10.^{37,38}

A possible explanation for the adult–child difference is that young children have not yet learned that the English eventive verb is perfective (not surprising since perfectivity is not overtly or unambiguously marked in English). Alternatively, it might be that the PC has not yet matured, under the assumption that UG principles can mature (Borer & Wexler, 1987). However, a maturational account would be at odds with what we observe in the Russian and Greek data discussed earlier, where the PC does block an ongoing meaning of perfective verbs. Moreover, the virtual absence of ongoing meaning in finite (–s) verbs in Table 10 argues that English-speaking children do know that the English eventive verb is perfective, and that they also obey the PC (or whatever derives its effects).

A closer look at Table 7, however, reveals that it is the atelic verbs that occur in ongoing contexts – in apparent violation of the PC, while the telic verbs are generally restricted to past contexts. This suggests that telic and atelic verbs – while perhaps both perfective as proposed by Giorgi and Pianesi – are behaving differently with respect to the PC, prompting a modification of their analysis.

Let us assume, in line with Giorgi and Pianesi (1997), that the English eventive verb is indeed perfective, but that the closure of the event is enforced differently in telic and atelic predicates, as suggested in (29):

- (29) (i) A telic predicate is closed by the telos.
 (ii) An atelic predicate is closed by tense, otherwise,
 (iii) An atelic predicate is open.

In (29) it says that event closure in English must be enforced (or licensed) by a tense or telic feature. Clause (29i) is consistent with the temporal schema proposed in (18b), in which *e2* closes the event giving rise to a past or (resulting state) interpretation, and never ongoing. The assumptions in (29ii) and (29iii) entail that in *finite* clauses an atelic predicate is perfective and so cannot denote an ongoing event.³⁹ This is true for adults and children alike, as shown in Table 10. However, when an atelic clause is tenseless (as in the bare verb stage), event closure is not enforced and the PC applies vacuously. Thus, bare atelic verbs may be linked to UT, as in (18a).

We can formalize the proposal in (29) by assuming that a null perfective morpheme in AspP (as proposed by Giorgi & Pianesi) must be licensed either by the telicity feature in the verb, as in (30a) or in the c-command domain of the specified tense, as in (30b):

- (30) a. $[_{TP} [_{ASPP} 0_{\text{perf}} [_{VP} V_{[+\text{telic}]}]]]$ Non-finite
 b. $[_{TP} [+tense] [_{ASPP} 0_{\text{perf}} [_{VP}]]]$ Finite

Why should perfectivity in English behave differently from languages like Greek and Russian, in which event closure is enforced even in the absence of tense/telicity? One speculation is that the tense/telicity licensing is required because the perfective morpheme in English is null. Or perhaps it is related to the fact that in English past tense and perfective aspect are morphologically fused, while in Greek and Russian they are separate morphemes. The role of telicity is obscured in the adult language because the root clause is always finite. Even in perceptual reports, although the embedded verb is non-finite, the temporal reference is determined by the tense/aspect of the matrix verb, viz. *saw* (in 28) is past/perfective. Thus, the root bare verb phenomenon, though non-adult-like, opens a window into the workings of the English aspectual system that is closed in the adult language.

7. Concluding remarks

In this article I have provided an account of the eventivity constraint on RIs and other non-finite forms in early language based on insights from both the modal reference (Ferdinand, 1996; Hoekstra & Hyams, 1998) and denotational (Avrutin, 1997; Wijnen, 1997) accounts of the EC, but which avoids many of the empirical problems of those proposals. The desired effects of the modal reference and denotational accounts follow without further stipulation from the system of aspectual anchoring developed in Hyams (2007) to account for the temporal/modal interpretations of non-finite verbs. The assumptions of AAH also explain why English does not show an eventivity effect. Finally, I have suggested that Giorgi and Pianesi's (1997) hypothesis that the English (bare) verb is perfective requires some modification in light of the acquisition facts. Root non-finite verbs in child language, though non-target-like, provide a window into aspectual properties of English that are masked in the adult language by the requirement that a root clause be finite.

In Hyams (2007) a system is proposed for temporally interpreting non-finite clauses. In this article the aspectual anchoring hypothesis is extended to explain a particular restriction on non-finite verbs, the eventivity constraint. There is, of course, the more general question of how and why the early grammar licenses non-finite verbs in root contexts, which is possible in adult grammar only in pragmatically marked circumstances, as in Mad Magazine sentences (*What, me worry?*), jussives (Dutch: *Hier geen fietsen plaatsen!* 'No bicycle parking here'), and so on. I have not attempted here to provide a general account of RIs and there are many such proposals in the literature (Hoekstra & Hyams, 1998; Rizzi, 2005; Wexler, 1994, among many others). It is tempting to imagine that non-finite verbs are possible in child language precisely because there is a system of aspectual anchoring in place for children but not for adults in the

general case, as suggested in Becker (2000, 2002). Such a hypothesis would have to explain (among other things) why RIs are possible in some languages (including those discussed here) and not in others, for example, the Romance pro-drop language (but see Pratt & Grinstead, 2007).

It is interesting to note in this regard that the aspectual system of the Romance pro-drop languages (e.g., Italian, Spanish) is like Dutch with regard to the absence of an event closure in simple verbs, as illustrated in (31) (cf. the Dutch examples in (19)):

- (31) a. Gianni mangia una mela.
John eat.3rd per. an apple
'John eats/is eating an apple.'
- b. Ho visto Gianni attraversare la strada.
(I) have seen John cross-INF the street
'I saw John cross/crossing the street.'

Italian (and Spanish) differ from Dutch, however, in that there is a perfective/imperfective aspectual opposition in the past tense, as in (32):

- (32) a. Gianni ha mangiato una mela
John has eaten-perf. Part. an apple
'John ate an apple.'
- b. Gianni mangiava una mela
John ate-imperf. an apple
'John was eating an apple.'

If we assume that RIs are licensed when an aspectual anchor is available (Becker, 2000), then a possible explanation for the lack of an RI stage in Italian and other Romance pro-drop languages is that a potential aspectual anchor (perfectivity) in these languages entails the projection of T (past tense), and hence finiteness. On the other hand, as was noted in the introduction, child Italian and Spanish do exhibit bare participles, as in (1c), an arguably non-finite structure. The participle is perfective and hence, following the assumptions of the AAH, provides a potential anchor to UT. No tense projection is required. Thus, in these languages we find bare participles, but not RIs.⁴⁰ A complete exploration of the implications of an aspectual anchoring account of RI licensing (as opposed simply to RI interpretation) is beyond the scope of this article. We leave this very interesting question for future research.

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Notes

1. These definitions of Vendler's aspectual types are from van Valin and LaPolla (1997).
2. Although Wijnen (1997, 1998) also considered the modal verbs *willen* (want), *moeten* (must), and *kunnen* (can) as statives, these verbs never occur as RIs and hence were excluded from his calculations.
3. The names and ages of the children are:

| | |
|----------|---------------|
| Josse | 2;0.7–2;6.22 |
| Matthijs | 1;11.10–2;8.5 |
| Niek | 2;7–3;2.13 |
| Peter | 1;9.6–2;1.26 |

4. In Table 1 and subsequent tables, I present the percentage of RIs and finite verbs that are eventive vs. stative. A reviewer has noted that it is also possible to organize the data to show the percentage of eventive and stative verbs that are finite vs. non-finite. The alternative method does not substantially change the results, as can be seen by comparing the mean percentages in the table below to those in Tables 1–5 in the text. However, because the EC is stated as a condition on RIs, it seems more natural to present the data as I have done in the text.

| Table/language | % of RIs/eventives | % of RIs/statives |
|-----------------|--------------------|-------------------|
| Table 1/Dutch | 84% (1795/2144) | 21% (93/443) |
| Table 2/German | 63% (301/480) | 8% (17/223) |
| Table 3/Russian | 33% (129/394) | 9% (7/74) |
| Table 4/Greek | 54% (212/396) | 0 (0/82) |
| Table 5/English | 52% (330/633) | 52% (149/288) |

5. The names and ages of the children in Blom's study are:

| | |
|----------|----------|
| Abel | 1;10–2;7 |
| Daan | 1;8–2;9 |
| Josse | 2;0–2;8 |
| Matthijs | 1;9–3;4 |
| Peter | 1;7–2;3 |

6. Blom (2003) classified as stative, verbs of possession (*hebben* 'have') and verbs of position (*zitten* 'sit', *staan* 'stand', *zijn* 'be', *liggen* 'lie'), as well as modal verbs *kunnen* 'can', *moeten* 'must', *willen* 'want'. Blom's data (and Wijnen's) support the observation originally due to de Haan (1987) that modals never occur as RIs. The criteria for Blom's classification into eventive and stative are not given explicitly.
7. Julia and Andreas's data are from the Childes database: Julia (Clahsen, 1986), Andreas (Wagner, 1985). The remaining four children are from Becker (1995).
8. One child, Johanna, does not adhere to the EC. Approximately 54% of Johanna's RIs are stative. Johanna's data are unusual in other respects as well, for example, she produced infinitival modals, which are completely atypical, as observed by de Haan (1987), Ferdinand (1996) and others.
9. The French children's data are from the Childes database (MacWhinney & Snow, 1985, 1990); the names and ages of the children are:

- Natalie 1;9–2;3 (Lightbown, 1977)
 Grégoire 1;9–2;3 (Champaud, CNRS, Paris)
 Daniel 1;8–1;11 (Lightbown, 1977)
 Philippe 2;1–2;6 (Suppes, Lévêille, & Smith. 1974)
10. Ferdinand found that in the first file (age 1;9) of two of the children, Natalie and Grégoire, eventive verbs were *always* non-finite while the two statives that occurred (*avoir* 'have' and *être* 'be') were finite. Such a 'no overlap stage' was first reported by de Haan (1987) for Dutch (but not confirmed by Blom, 2003), and also by Meisel (1985) for his bilingual French–German speaking children. Most of the studies reporting a non-overlap stage have not provided quantitative data and so it is difficult to determine whether or the stage is real or an artifact of the low number of utterances during the earliest sessions.
 11. Vavara's data are from Childes (MacWhinney & Snow, 1985, 1990). The data were collected by E. Protassova.
 12. Stephany (personal communication, and 1981) excludes the verbs *exo* (have) and *ime* (be) from the analysis of statives because they do not have separate perfective and imperfective forms.
 13. The data in Table 5 are based on the following files: Adam age 2;3–3;5; Eve 1;6–1;11; Sarah 2;11–3;3; Nina 2;4–3;0; Naomi 2;5–3;5 (Childes: Brown, 1973; Suppes, 1974; Sachs, 1983; MacWhinney & Snow, 1985, 1990).
 14. A reviewer observes that the English-speaking children are on average older than the non-English-speaking children reported on in the other tables. This raises the possibility that the lack of an EC in English is due to the older age of these children, and indicates a developmental change rather than a difference between languages. While this cannot be ruled out conclusively without further data and children, there are a couple of facts that argue against this hypothesis. First, two of the Dutch children are as old as the average English-speaking child: Niek's data go to age 3;2 (see note 3) and Matthijs's to age 3;4 (see note 5) and the eventivity effect in their data is as strong as for the younger children. Second, Eve is as young or younger (1;6–1;11) than most of the non-English speaking children, and her data are in line with the older English-speaking children.
 15. Simplifying somewhat, Barbiers proposes that deontic modality involves what he calls a 'polarity transition': the expression *must P*, where P is a proposition modified by the modal, presupposes that P is not the case and states that a transition from not P to P is required. Because statives have a homogeneous internal structure (i.e., there is no beginning or end of an event), the requirement of a transition cannot be satisfied.
 16. A possible counterexample to this claim is the finding in Blom (2003) (and also Wijnen, 1997) of stative RIs with modal meaning in Dutch. Blom finds 37 such cases, 31 of which contain the stative verb *hebben* 'have' and which typically undergo type-changing to an eventive, meaning roughly 'get', as illustrated in (i) and (ii).
 - (i) Ik ook hebben.
I also have-inf.
'I also want to have (get) one.'
 - (ii) Soel (stoel) hebben.
Chair have-inf.
'I want to have (get) a chair.'
 17. As a reviewer notes, the generalizations in (11i) and (11iii) do not hold in English. English does have non-finite *wh* questions (Roeper & Rohrbacher, 1994) and also has a lower proportion of null subjects with non-finite verbs than is typical of RI languages (see Hoekstra & Hyams, 1998 for a review of statistics). Various proposals have been made to explain these differences (and others) between English and other languages that show an RI-like stage. Several of these involve some version of the hypothesis that the English bare verb may be

non-finite or finite (but lacking agreement) (see Blom, 2002; Gavrusseva, 2002; Hoekstra & Hyams, 1998). If some bare verbs are 'hidden' finite structures, then English bare verbs will not pattern uniformly like RIs in other languages, which do adhere to (11i, iii). I briefly address the hidden finiteness hypothesis later (see note 21 and section 6), and suggest an explanation for the absence of the effects in (11i, iii) in section 5. The relevant point for our present purposes is that the null modal account will not work for RIs in languages which have true morphological infinitives, e.g., Dutch, French. And irrespective of the status of (11i, iii), the null modal hypothesis cannot work for English because English does not show a model reference effect, as noted in the text.

18. The finiteness assumption is also problematic in that it fails to explain the lack of agreement in the Greek bare perfective. Children's bare perfectives always end in *-i*, the default, 3rd person ending, irrespective of the grammatical person of the subject, e.g., (6b) where the intended subject is the child herself. The lack of agreement is further evidence for the claim that the bare perfectives are non-finite. See Hyams (2002, 2005) and Varlokosta et al. (1998) for further discussion of this point.
19. See also Avrutin (1997) for a different version of the denotational account of the EC based on Heim's (1982) discourse representation theory.
20. Indeed, Wijnen (1997) notes that his analysis allows RIs to have 'free reference,' i.e., past, present, and modal options are equally accessible. As discussed in Hyams (2007) and in section 3, however, reference is not really free in RIs: past tense is not an option in Dutch and German and languages vary widely with respect to the modal option.
21. Blom (2003) addresses the lack of an EC in English. She proposes that English bare verbs form a heterogeneous set: some bare verb tokens are true non-finite forms while others are finite verbs that lack 3rd person morphology. Blom's hypothesis is a weaker version of a generalized *-s* drop hypothesis, which says that all bare verbs are really finite forms in which 3rd person morphology is omitted either because it is weakly stressed (Gavrusseva, 2003) or because the bare form is the least specified form in the paradigm (Ferdinand, 1996). Under the heterogeneous set hypothesis, English does not violate the EC because the apparent bare statives are really finite. While not implausible, several facts argue against the the *-s* drop and heterogeneous set hypotheses. First, bare and *-s* forms behave differently with respect to negation (Harris & Wexler, 1996). Bare forms frequently occur following *no/not* as in (i) while finite forms, as in (ii), rarely do. (But see Tesan & Thornton, 2004, who find that two of the three children in their study produced examples such as (ii) about 25% of the time.)
 - (i) Mommy not sit chair.
 - (ii) @Mommy not sits chair.

Second, finite *wh* questions typically have overt subjects while bare *wh* questions occur overwhelmingly with null subjects (Roeper & Rohrbacher, 1994).

- (iii) Where __ go?
- (iv) Where Mommy goes?

Third, the majority of bare eventive verbs used by English-speaking children denote ongoing events, in contrast to their finite present tense verbs that denote only habitual events or have a property reading, as is correct in the adult language (Deen, 1997; Madsen & Gilkerson, 1999; Torrence & Hyams, 2004). (This last point is discussed in section 6.) The differences between finite and bare verbs in English constitute strong arguments against the claim that bare verbs are hidden finite forms in the general case.

However, as we see in section 6 (Table 10) 27% of the children's bare eventive verbs have a habitual/property reading. It might then be that these tokens (or some subset thereof) are

- precisely the finite verbs that are masquerading as non-finite forms, having undergone a process of *-s* deletion, while the remaining 73% (or higher) ongoing bare verbs are true bare verbs (hence, a heterogeneous set). However, the heterogeneous set effect, if it exists, should hold for both stative and eventive verbs. If statives undergo the same process of *-s* deletion (at the same rate) the number of non-finite statives in Table 5 would be reduced by 27% (from 139 to 102). But even applying this function, statives still constitute about 22% of the total number of bare verbs (102/469), a substantially higher proportion than in other child languages.
22. Gavruseva (2002, 2003) proposes an account of RIs and the eventivity constraint on RIs based on the aspectual features of telicity and punctuality. Torrence and Hyams (2004) tested this hypothesis in English (using data from Adam, Eve, and Sarah) and found that it did not make the correct predictions with respect to the distribution of finiteness and aspectual class in English. Blom (2003) tested the hypothesis in Dutch and found it similarly inadequate. See Torrence and Hyams (2004) and Blom (2003) for further details.
 23. The findings reported in Table 6 and all other tables in this section are based on eventive verbs only. The data in Table 6 are from English data: Nina (2;4-3;0), Naomi (2;1-3;5), Sarah (2;11-3;0), Adam (2;3-3;5), Eve (1;6-1;11) (Hoekstra & Hyams, 1998 and references cited therein; Torrence, 2002). Russian data: Brun (personal communication): (Sasha P. 1;6-2;5; Sasha J. 2;4-2;8; Varvara 1;6; Zhenya 1;6). Greek: Stephany (1985, and personal communication) (Natali 1;8; Spiros 1;9; Janna 1;11; Mairi 1;9). Dutch: Wijnen (1997) (Josse 2;0-2;6; Mathijias 1;11-2;8; Niek 2;7-3;2; Peter 1;9-2;1). Blom (2003) (Abel 1;10-2;7; Dann 1;8-2;9; Josse 2;0-2;8; Laura 1;9-3;4; Matthijs 1;9-2;11; Peter 1;7-2;3). See Hyams (2007) for individual subject data.
 24. Some of the data in Table 7 are from Torrence and Hyams (2004) and additional data were provided by Jill Gilkerson, based on the following Childes files: Nina 2;4-3;0 (files 20-32; 39-45); Naomi 2;5-3;5 (files 63-73; 74-86); Sarah 2;11-3;3 (files 39-53) (Childes, Brown, 1973; MacWhinney & Snow, 1985; Sachs, 1983; Suppes, 1974).
 25. Most of the bare atelic verbs have an ongoing ('here and now') meaning, as illustrated by the example in (12b). This is in contrast to finite present tense verbs in adult (and child) English which are generic or habitual, viz. *John smokes a lot/*now*. I return to this issue in section 6.
 26. Becker (2000, 2002) proposes a somewhat different version of aspectual anchoring, and specifically of the TAR. On her account languages may vary with respect to whether the tense operator (in CP) binds Infl or Asp. In the former case, the clause is finite, in the latter non-finite (as in child language). Becker is specifically concerned with explaining certain aspectual restrictions on copula drop in early English (e.g., *this empty, my pen down there*), and does not discuss the non-finite lexical verbs such as those discussed here. It would be interesting to see to what extent the EC might also be derived from the system of aspectual anchoring proposed by Becker.
 27. See Brun et al. (1999) for a similar proposal with the difference that under the AAH it is the telic event, *e2*, that provides the anchor point while Brun et al. propose that it is the event boundary. The relevance of the difference will be obvious shortly.
 28. This analysis of Russian aspectual anchoring departs from that proposed in Hyams (2007), where it is assumed that Russian has a mixed system in which some prefixes mark telicity and others perfectivity. Brun and Babyonyshev (2006) criticized that analysis, arguing that Russian children treat all perfective RIs similarly, arbitrarily assigning either a modal or past interpretation. The revised analysis presented here is more in line with their findings. I am grateful to Hagit Borer for her help with the Russian analysis.
 29. According to Boogaart (1999) past tense achievement verbs (e.g., *die*) in narrative discourse only have a perfective reading, as illustrated in (i), in contrast to accomplishments as in (19) in the text.

- (i) Toen ik thuiskwam, stierf opa.
When I came home died grandpa
'When I came home, grandpa died/*was dying.'

Given the assumptions of the AAH, we predict that the few past tense RIs that do occur in Dutch (see Table 6) are achievements and not accomplishments, a hypothesis that is yet to be tested.

30. The principle of full interpretation requires that all superfluous (non-interpretable) symbols be eliminated before logical form, symbols such as expletive *it*, existential *there*, and dummy *do*.
31. I am grateful to one of the anonymous reviewers for raising this question.
32. *Do* differs from *be* in this respect in that *be* never occurs overtly in non-finite clauses. Rather, we find null *be*, as in *Mommy happy/going*. It is reasonable to ask why there is no similar need for non-finite *be*, resulting in sentences such as *Mommy ben't happy*. As pointed out by C. Schütze (personal communication), this is because non-finite *be* does not raise above negation.
33. We would not, therefore, expect children to produce overt *do* in non-finite affirmative sentences, e.g., *The doggie do bark*. Thanks to Norbert Hornstein for first bringing this issue to my attention.
34. See Kratzer's paper for extensive arguments, semantic as well as syntactic.
35. Blom (2003) observes in finite clauses containing modals (e.g., *ik moet daar zitten, he 'I must there sit-inf., huh'*) stative verbs occur very infrequently (8% of stative verbs). That finite modal sentences as well as RIs are constrained by the EC supports the hypothesis that the eventivity effect is associated with deontic modality.
36. Compare, for example, the Dutch sentences below. As noted in the text, the Dutch verb is aspectually neutral, and hence does not trigger the Punctuality Constraint in these cases.
- (i) Jan spelt veel/nu.
'John plays a lot/now.'
- (ii) Ik zag Jan de straat oversteken toen hij door auto aangereden werd.
'I saw John cross/crossing the street when he was hit by a car.'
37. Nina 2;4-3;0 (files 20-45); Naomi 2;5-3;5 (files 63-73); Sarah 2;11-3;3 (files 39-53) (Childes, MacWhinney & Snow, 1985; Sachs, 1983; Suppes, 1974).
38. Deen (1997) shows that Adam (Brown, 1973; Childes, MacWhinney & Snow, 1985) also uses a substantial number of bare verbs with ongoing meaning. Of 66 bare verbs (in randomly selected files between Adam file 1 and Adam file 30), 69% (47) had an ongoing interpretation, while only 29% (19) had a habitual meaning. Most of the habitual RIs occur in the last two files (Adam 28 and Adam 30). The proportions in the files up to Adam 28 are 92% 'here and now' and 8% habitual. Deen did not include finite verbs in his analysis and so it is not possible to say with certainty that Adam treated bare eventive verbs differently from finite eventive verbs, as do the children in Table 10, but it seems unlikely that he would have used many *-s* marked verbs with an ongoing meaning without this catching the attention of investigators.
39. Similarly, in perceptual reports like (26a), though the embedded verb is non-finite, its temporal reference is anaphoric on the tense/aspect of the matrix verb, e.g., *saw*. C. Schütze points out to me, in fact, that in (i) the small clause bare verb in the lower clause can have ongoing meaning, clearly showing that the perfectivity of the bare verb is sensitive to matrix tense. In this example, the matrix verb is progressive which cancels the completion entailment of the telic verb in the lower clause.
- (i) I am watching John cross the street.

40. Like the other non-finite verbs discussed in this article, bare participles are restricted to eventive verbs. Indeed, they are almost exclusively telic. This ‘super-eventivity’ also follows from the AAH: the only option for anchoring a participle is through the second event variable (*e2*) in a telic predicate (see 18b). The process event (*e1*) is closed, hence by the punctuality constraint not a possible anchoring point, and the modal option is excluded because modals do not select for participles (see Hyams, 2007; Hyams & Schaeffer, 2008 for details).

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