

Acquisition of the Malagasy voicing system: implications for the adult grammar

Nina Hyams · Dimitris Ntelitheos ·
Cecile Manorohanta

Received: 22 October 2004/Accepted: 28 June 2006 /
Published online: 1 November 2006
© Springer Science+Business Media B.V. 2006

Abstract In this paper we discuss the acquisition of the voicing system of Malagasy, an Austronesian language. Our study is based on the longitudinal data of three children ages 19–32 months, and is to our knowledge the first systematic investigation of the acquisition of Malagasy. The Malagasy voicing system has a distinctive morphology and involves the promotion of an argument (*actor, theme, instrument, etc.*) to a referentially and syntactically prominent position, typically clause-final. We look at two competing accounts of the Malagasy voicing system, one in which the promoted argument is analyzed as a subject and the promotion operation an instance of A-movement (Guilfoyle, Hung, & Travis, 1992) and a more recent account in which Malagasy is analyzed as a V2-like language in which the promoted argument is a topic and the promotion an instance of A'-movement (Pearson, M. (2001); Pearson, M.

We would like to express our deepest appreciation to the children and families who participated in our study. Our gratitude also to Ed Keenan, who spent countless hours going through the acquisition data with us and who never tired of explaining the fine points of Malagasy or sharing with us his adventures in Madagascar. Thanks also to Matt Pearson and Lisa Travis for their very detailed comments on an earlier draft of this paper, to Murat Kural, Nathan Klinedinst, and three NLLT reviewers whose careful reading has greatly improved this paper. Our appreciation also to Marcel den Dikken for his help throughout the review process. Parts of this paper have been presented at AFLA XIII and at GALA 2005. We are grateful to the audiences at these conferences for their helpful comments. Finally, our thanks also to Zahra Khalili and Nathan Klinedinst for editorial assistance. This project was partially supported by a UCLA Faculty Senate Grant to Hyams. All errors are of course our own.

N. Hyams (✉) · D. Ntelitheos
Department of Linguistics, UCLA,
405 Hilgard Avenue, Los Angeles, CA 90095, USA
e-mail: hyams@humnet.ucla.edu

D. Ntelitheos
e-mail: dntelith@ucla.edu

C. Manorohanta
Université Nord, B.P. 0, UNM 201
Antsiranana, Madagascar
e-mail: cmanoroh@dts.mg

(2005)). Both analyses have clear implications for acquisition, which we examine in this paper. Our acquisition results favor the analysis of the promoted argument as an A'-element. We also show that there is a developmental stage in Malagasy that parallels the root infinitive (RI) stage widely observed in various European languages. Apparent differences between the Germanic RIs and the analogous phenomenon in Malagasy are derived from differences in the functional structure associated with a voicing system as opposed to an agreement system.

Keywords Voice · Malagasy · Acquisition · A-chain maturation · A-movement · A'-movement · Passive · Topicalization · Root infinitives · Austronesian · Continuity

1 Introduction

Malagasy is an Austronesian language spoken on the island of Madagascar and is closely related to Philippine languages such as Tagalog. One of the most notable aspects of Malagasy grammar, which it shares with other Western Austronesian languages, is an elaborate voicing system. The voicing system has a distinctive morphology and involves the promotion of an argument (*actor, theme, instrument, etc.*) to a referentially and syntactically prominent position, typically clause final. Following Pearson (2005) (and Schachter (1987) for Tagalog) we refer to this prominent DP as the *trigger*. The voice morphology on the verb identifies the thematic role of the trigger as *actor, theme, instrument, location, etc.*

In this paper we explore the acquisition of the Malagasy voicing system based on a longitudinal study of three children ages 19–32 months. To our knowledge this is the first systematic study of the acquisition of Malagasy. Our study addresses an important debate within the Malagasy literature over whether the trigger is a clausal subject (Guilfoyle, Hung & Travis, 1992) or a clause external topic (Pearson, 2001, 2005) and the related question of whether the argument promotion involves A- or A'-movement. These issues have been explored extensively in the Malagasy adult literature. In this paper we examine these questions from a developmental perspective. To anticipate our results, the acquisition data favor the analysis of the promoted argument as an A'-element. We also show that there is a developmental stage in Malagasy that parallels the root infinitive (RI) stage widely observed in various European languages.

The acquisition of the Malagasy voicing system is interesting not only for what it can tell us about the structure of adult Malagasy, but also for the insights that it provides into the principles that guide morphosyntactic development in children. Because the voicing system involves aspects of grammar such as word order and finite morphology that are typically acquired very early and with few errors, it has the potential to shed light on various theoretical debates in first language acquisition. These include the nature of early clause structure and the specification of finiteness in the early grammar, the development of A- versus A'-movement, and the role of grammatical complexity versus input in driving syntactic development.

In the next section we outline the basic assumptions of the acquisition framework we adopt. In Sect. 2 we briefly discuss the voicing system of Malagasy and other aspects of the adult grammar that are relevant to our acquisition study. We then turn to the developmental issues. In Sect. 3 we discuss the acquisition-theoretic and

empirical context for understanding the Malagasy acquisition results and how these results can inform the debate concerning the structure of the adult language. We look in particular at the acquisition of A- and A'-movement and argument omission in various child languages that have been studied. In Sect. 4 we present the children in our study and the coding conventions we adopted for the Malagasy corpora. In Sect. 5 we report the results of our study and discuss the theoretical implications for the debate on the voicing system of Malagasy. In Sect. 6 we consider the possible effects of input frequency on the acquisition results. Finally, in Sect. 6 we offer some concluding remarks.

1.1 A universalist approach to grammatical development

In this paper, we adopt a 'universalist' approach to grammatical development. There are several assumptions of such a model. First, just as adult grammars do not vary in wild and unpredictable ways, we assume that child grammars as well fall within the limits imposed by the principles and parameters of Universal Grammar (UG). This assumption of 'continuity' (Hyams, 1983, 1986; Klein, 1982; Pinker, 1984; White, 1982, among others) has received wide empirical support. Where UG constraints have been directly tested, children are found to obey them to a significant degree (see, for example, Crain (1991), Crain and Pietroski (2001) for an overview). Though there are cases in which pieces of pragmatic competence (e.g. constraints on coreference) or even grammatical competence (passives, as discussed below) are subject to maturation, there is no compelling evidence that children violate principles of UG at any point in development (see for example Chien and Wexler's (1990) UG-constrained maturation).

Just as the comparative study of adult languages has uncovered deep commonalities, so the detailed comparison of different child languages has revealed striking uniformity in development with respect to core principles of grammar. For example, UG parameters are instantiated in early grammar in a predictable way. Across languages we find an early setting of many UG parameters, typically by the time children utter their first multi-word utterances. This is true in the domain of verb movement, for example: V2 languages are V2 languages 'all the way down'; there is no stage at which children fail to respect the V2 requirement on finite verbs (see Hyams, 1992; Meisel & Müller, 1992; Poeppel & Wexler, 1993; Verrips & Weissenborn, 1992, among many others). The phenomenon is not limited to the Germanic languages. Verb movement (V to I) is quickly fixed in French (Pierce, 1992) and Irish (Hickey, 1987), and other typologically diverse child languages. Similarly, children quickly determine whether their language is a *pro*-drop language, a topic drop language, or a language which requires the overt expression of arguments (de Haan & Tuijnman, 1988, Valian, 1991, Rizzi, 1994, Verrips & Weissenborn, 1992, Wang, Martin, Best, & Levitt, 1992, among many others). Hoekstra and Hyams (1998) refer to this property of language development as 'early morphosyntactic convergence' (EMC).

There are other aspects of language that show a more protracted development and which may be subject to maturation. For example, children under the age of six or so allow local coreference of pronouns in sentences like *Ernie washed him*. Various studies show that the principle blocking local coreference is delayed in development (Chien & Wexler, 1990; Grodzinsky & Reinhart, 1993). What is relevant to the present discussion is that we find a delay in the constraint against local coreference (however formulated) across various child languages, e.g. English, Dutch, Icelandic, and Danish.

Similarly, while verb movement is an early development, it has been argued, notably by Borer and Wexler (1987), that (certain kinds of) A-movement mature later in development (around age 4–5). The late A-chain hypothesis will be discussed in greater detail in Sect. 4.1. At this point we simply note that despite some claims to the contrary, it is the case that the relevant kind of A-chain is delayed for all children, not only those acquiring the European languages, again in line with a universalist approach to grammatical development. In short, the available cross-linguistic evidence shows uniform development with respect to the timing of core (morpho)syntactic parameters, a phenomenon that we refer to as ‘uniform principle/parameter instantiation’ (UPI).

There are cases, however, in which differences in the adult target influence the trajectory of development. Most notable is the RI phenomenon. It is well-known that children acquiring certain languages show an early stage (around age 2–3) in which root verbs appear in the infinitival form; for example, *Auch Teddy fenster gucken* (‘also Teddy window look-INF’) in German child language. In the various child languages that exhibit an RI stage the phenomenon is quite robust and relates to a number of other salient properties of early language. For example, as will be discussed in greater detail below, RIs tend to occur with null subjects (see Hoekstra & Hyams, 1998 for review of relevant literature). Various properties and contingencies point to RIs being a genuine grammatical effect, and not the result of production limitations or other performance factors. Nevertheless, they fall short of universality. Certain child languages do not show an RI stage, such as the Romance null subject languages Italian, Spanish, Portuguese, Catalan, as well as Hungarian and Slovenian. The variation in child languages with respect to RIs is closely tied to morphosyntactic properties of the target, the consensus being that RIs are blocked in languages with syntactically rich agreement (though analyses differ with respect to how the morphological features block RIs). Thus, even with respect to the RI stage, where we do find variation, the patterns are predictable (cf. Rhee & Wexler, 1995; Sano & Hyams 1994).

The evidence suggests that continuity and UPI are deeply rooted properties of grammatical development. That said, they are still empirical working hypotheses; it is always possible that the next child language will show that these principles are wrong. In this respect the study of child language is no different from the study of adult language, in which proposed principles of UG are continually subject to empirical scrutiny. In this paper we use the insights gained through the study of the European child languages, the Germanic and Romance languages in particular, to study the acquisition of the voicing system in Malagasy. If language development is guided by general linguistic and developmental principles, we expect that with respect to core properties of grammar Malagasy children will follow the same or a similar developmental trajectory, influenced perhaps by the particular factors of Malagasy morphosyntax. As we will see, Malagasy does not depart in dramatic ways from the other child languages that have been studied.

2 The Malagasy voicing system

The discussion of the Malagasy voicing system that follows is based largely on Pearson (2005). As noted above, Malagasy clauses generally contain a referentially and syntactically prominent constituent, the trigger, which appears at the right periphery of the clause, typically in final position, as illustrated in (1). (Sentence (1) and subsequent examples are from Pearson (2005) unless otherwise indicated. Following Guilfoyle

et al. (1992) and Pearson (2001, 2005) the trigger is **boldfaced** while the actor is underlined.)

- (1) Nametraka ny boky teo ambonin'ny latabatra **ny vehivavy**.
Pst.AT.put Det book Pst.there on.top'Det table Det woman
 The woman put the book(s) on the table.

The trigger denotes a referent that is given and must therefore be grammatically definite. Indefinite noun phrases, which lack an overt determiner, may not be triggers. The definiteness requirement on the trigger is one of the arguments in favor of a topic analysis, an issue we turn to below.

Constituency tests show that in addition to being clause final, the trigger is also external to the predicate phrase (the predicate phrase consists of the verb and its non-trigger dependents (Keenan, 1976, 1995)). For example, several particles including the yes-no particle *ve* occur at the boundary of the predicate phrase and the trigger, as in (2).

- (2) Nametraka ny boky teo ambonin'ny latabatra *ve* **ny vehivavy?**
Pst.AT.put Det book Pst.there on.top'Det table Qu Det woman
 Did the woman put the book(s) on the table?

The grammatical function of the trigger is encoded by voice morphology on the verb, as illustrated in (3) for the verb root *vono* 'kill'. In (3a) the verb form is *ma-mono*.¹ This is the form that is used when the trigger is the actor (external argument). Following Guilfoyle et al. and Pearson, we refer to this form as the AT (*actor-topic* or *actor-trigger*) form;² (3b) illustrates the TT (*theme-topic* or *theme-trigger*) form of the verb, *vonoin*, which occurs when the trigger is the *theme* (internal argument). The CT (*circumstantial-trigger* or *circumstantial-topic*) form *amonoan* occurs when the trigger is an oblique nominal expressing a 'peripheral' participant role, such as *instrument*, *location*, *manner*, etc., that is licensed by a preposition in non-CT clauses, as illustrated in (3c).

- (3)a. Mamono ny akoho amin'ny antsy **ny mpamboly**.
AT.kill Det chicken with'Det knife Det farmer
 The farmer is killing the chicken with the knife.
- b. Vonoin' ny mpamboly amin'ny antsy **ny akoho**.
TT.kill Det farmer with'Det knife Det chicken
 The chickens, the farmer is killing (them) with the knife.
- or The chickens are killed by the farmer with a knife.

¹ There are various phonological processes that happen when voice morphology is added to the root. These are described by Pearson (2001) as including nasal assimilation, deletion or mutation of root initial and root final consonants, vowel reduction and coalescence and (in forms such as *vonoina*) the insertion of extrametrical default vowel *a*. The child's acquisition of these phonological processes is of great interest but beyond the scope of our current study. Here and throughout the paper we will abstract away from the various phonological changes that accompany affixation of voice morphology.

² Pearson (2005), following Schachter (1987), uses the term *actor* not as the name of a thematic role but as a cover term for the argument to which the predicate assigns the external thematic role; the actor is typically the agent or experiencer argument. Similar remarks apply to *theme*, which is the cover term for 'internal argument of a transitive predicate.' We follow this usage. The terms *subject* and *object* are avoided because the subject status of the trigger in Malagasy is precisely what is at issue, as we will see shortly.

- c. Amonoan' ny mpamboly ny akoho **ny antsy**.
CT.kill Det farmer Det chicken Det knife
 The knife, the farmer is killing the chickens (with it).

or The knife is being used by the farmer to kill the chicken.

Malagasy voice morphology can involve prefixation, suffixation, both prefixation and suffixation, and in some cases the verb occurs as a root (bare) form. As illustrated in the sentences in (3), all of which contain the verb root *vono* 'kill', AT morphology (in 3a) involves the prefix *m-*, as in *m-amono*,³ TT morphology (in 3b) involves a suffix *in*, as in *vona-in* (a prefix *a-* and a suffix *an* are also used quite productively). The oblique CT form, *a-mono-an*, has both a prefix and a suffix. The morphological templates for the different voices are given in (4). Notice that in addition to *m-*, the AT form contains another verbal prefix realized as *an-* or *i-*, which is also found in the circumstantial, but not in the TT form.⁴

- (4) AT:*m-* + *an-/i-* + ROOT
 TT:ROOT+*-in*
 CT:*an-/i-* + ROOT + *-an*

The circumstantial is more complex than the other voices in its morphology and syntax.⁵ We will see that this additional complexity is reflected in the child's development of the different voices.

There are also cases in which the verb occurs in a root form, that is to say, without voice morphology. These root forms are mainly TT roots, as in (5a), but some AT verbal roots (functioning mainly as auxiliary verbs) exist as well, as in (5b).

- (5)a. Haino-ko **izy**
listen-1SG.GEN 3.NOM
 As for him, I listen(ed) to (him).
- b. Avy nisakafo **izy ireo**
come PST.AT.dine 3.NOM DEM.PL
 They just ate.

In addition to voice morphology, the Malagasy verb is inflected for tense. All the tense morphemes are prefixes. Malagasy has 3 tenses: present, past, future (future may also be considered an irrealis form (Pearson, 2001)). Present tense is unmarked (see note 3). The past tense morpheme is *n-/no-* and the future/irrealis marker is *h-/ho-*. However, the future/irrealis morpheme is pronounced only in very careful speech. The allomorphy is controlled by the initial segment of the verb, *h-/n-* occurring before

³ Traditionally, *m-* has been analyzed as the present tense morpheme (Rajaona, 1972; Rajemisa-Raolison, 1971) because it is in complementary distribution with the past and future tense markers (see (6)). However, Pearson (see also Builles, 1988; Travis, 1994) argues persuasively that it is an AT voice marker and that present tense is unmarked in Malagasy. He attributes the absence of *m-* in past and future contexts to a low level morpho-phonological rule that deletes *m-* after the past tense prefix *n-* and the future prefix *h-*. See Pearson (2001, 2005) for discussion. In our analysis we follow Pearson and take *m-* to be a voice marker.

⁴ This is an oversimplification of the system. Some AT verbs take the prefix *a-* (not to be confused with the TT voice prefix *a-*), as in *m-a-tory* 'sleep'. There are also a handful of verbs that take no prefix, so that *m-* attaches directly to the root, as in *m-ody* 'to go home'.

⁵ For example, Keenan and Manorohanta (2001) (see also Guilfoyle et al., 1992; Keenan & Polinsky, 1998) argue that the circumstantial verb is built from the AT form less the *m-* prefix.

vowels and *ho-/no-* before consonants or roots. The tense prefix precedes the *an-/i-* prefix in the AT and CT forms, and in the TT form the tense prefix affixes directly onto the verb root because the TT marker is a suffix (see (4)). The morphological templates for the tense paradigm (including voice morphology) are given in (6).

- (6) AT: T + *an-/i-* + Root
 TT: T + Root + *-in*
 CT: T + *an-/i-* + Root + *-an*

We have described the tense system for completeness, but we will have little else to say about tense marking except insofar as it relates to the children's expression of voice morphology. (For a more detailed discussion of Malagasy morphology, see Keenan & Polinsky, 1998.)

2.1 Information structure and promotion to trigger (PTT)

As discussed by Pearson (2005), the sentences in (3) all have the same propositional content. Though they are truth-conditionally equivalent, they differ in how the informational content is packaged, particularly with regard to which participant is identified as the principal subject matter (viz. the argument of sentence-level predication). Informally, then, the sentence in (3a) is about the farmer, the sentence in (3b) is about the chickens, and the sentence in (3c) is about the instrument, the knife. Following Pearson (2005), we refer to the operation that maps one of the verb dependents to the trigger function as *promotion to trigger*, or simply PTT.

The TT voice is functionally similar to passives in languages like French and English in that the theme is promoted over the agent to a structurally and pragmatically salient external argument position. Indeed, the traditional view of the PTT process is that it involves A-movement, either passivization (e.g. Keenan, 1976; Rajemisa-Raolison, 1971) or raising to subject (Guilfoyle et al., 1992). A more recent proposal is that PTT involves topicalization or A'-movement (Pearson, 2001, 2005; see also Richards, 2000). These competing analyses are reflected in the two sets of translations for the sentences in (3). At issue also is the identity of the trigger itself, whether it is properly analyzed as a subject in Spec IP (e.g. Guilfoyle et al., 1992), or as a right-peripheral topic (Pearson, 2001, 2005).

2.1.1 The trigger as subject

The trigger shares certain distributional properties with subjects in other languages. For example, it seems to obey the extended projection principle (EPP), the requirement that every predicate have one and only one subject (Chomsky, 1995). It also has distinctive (arguably nominative) case morphology (but see Pearson, 2005; Ntelitheos & Manorohanta, 2004 for discussion). For these reasons and others, the trigger has traditionally been identified as the subject of the clause. We henceforth refer to this as the 'subject hypothesis'. The subject hypothesis entails that non-AT constructions (e.g. (3b, c)), in which a theme or oblique argument is promoted to subject position, are passives, as originally proposed by Keenan (1976) and Rajemisa-Raolison (1971).

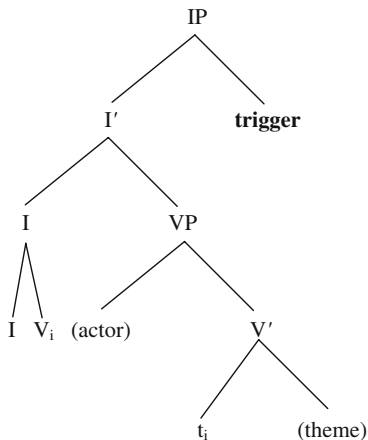
Guilfoyle et al. (1992) and others point out, however, that the non-AT constructions differ from passives in other languages in important ways. In particular, there is evidence that the non-trigger actor (the underlined constituent in the examples in (3)) is the subject of the clause. For example, it must be adjacent to the verb, as illustrated in

(3b, c). Pearson (2005) notes that this is unusual for a demoted or oblique argument in a passive (e.g. English *by* phrase), but is rather reminiscent of the adjacency requirement on subjects in Berber and in various Semitic and Celtic languages (Ouhalla, 1994). Also, in TT imperatives the non-trigger actor (the underlined constituent) is missing and not the trigger (the boldfaced constituent). Compare the imperatives in (7) and (3b, c).

- (7)a. Vonoy **ny akoho**
TT.kill.Imp Det chicken
 Kill the chickens!
- b. Amonoy akoho **ny antsy**
CT.kill.Imp chicken Det knife
 Use the knife to kill chickens!

In order to account for the fact that both the trigger and the non-trigger actor in TT clauses have subject characteristics, Guilfoyle et al. (1992) propose that there are in fact two subjects in the Malagasy clause, one in Spec VP (Fukui & Speas, 1986; Kitagawa, 1986; Koopman & Sportiche, 1991; Kuroda, 1988) and one in Spec IP. On their analysis the actor is generated in Spec VP while the theme is generated internal to VP. Either the actor or the theme raises to Spec IP and maps onto the trigger function. As illustrated in the structure in (8), the verb adjoins to INFL and winds up at the left edge of the clause immediately preceding the actor.⁶

(8)



The movement to Spec IP is motivated by case considerations. According to Guilfoyle et al., the voice affixes are case assigners that license all but one of the verb's dependents inside VP. The remaining argument must therefore raise to Spec IP to check nominative case. In AT clauses the AT voice morphology assigns case to the theme in situ and the actor raises to Spec IP where nominative case is checked. In TT clauses TT voice assigns case to the actor in the Spec VP position and the theme is forced to raise to the Spec IP to check nominative case. The circumstantial has two

⁶ An oblique argument can also raise to Spec IP (i.e. the circumstantial). For ease of exposition we ignore this part of the structure. We return to the circumstantial in Sect 6.

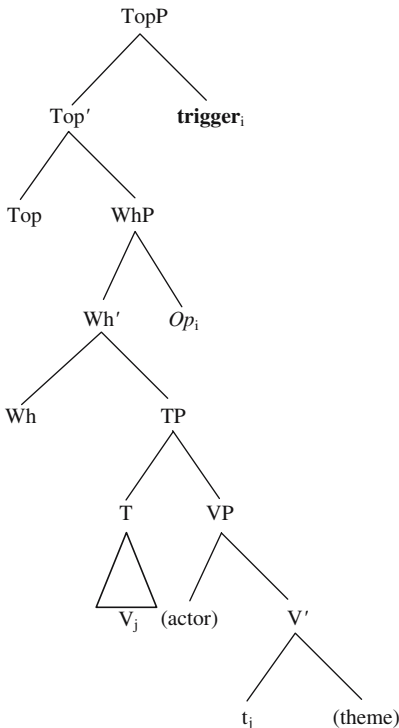
case assigning affixes (see (4)), and hence the theme and actor are both assigned case within VP. The oblique argument raises to Spec IP where it is assigned nominative case. The preposition associated with the oblique argument undergoes incorporation as in Baker’s (1988) analysis of applicatives. Preposition incorporation is one of the syntactic factors that make the CT voice a more complex structure. We return to this in Sect. 6.

Thus, in Guilfoyle et al.’s analysis, Malagasy (and other Austronesian languages) differs from a ‘single subject’ language like English in that the case-assigning voice morphemes license a second subject (in Spec VP) in addition to the canonical Spec IP subject.

2.1.2 The trigger as topic

Pearson (2001, 2005) departs from the subject/A-movement analysis and proposes instead that the trigger is a topic located in the C-domain. Henceforth, we refer to this as the ‘topic hypothesis’. More specifically, he assumes that the trigger is base-generated in Spec TopP (Rizzi, 1997) and receives case and theta properties through coindexation with a null operator (*Op*) that raises to the specifier of WhP (also in the C domain) from an argument position inside VP, either actor, theme, or oblique (for example, instrument, benefactive, etc.). Under Pearson’s topic hypothesis, PTT involves A’-movement, not A-movement. The structure he assumes is roughly as in (9).⁷

(9)



⁷ This is a simplification of Pearson’s proposal, which involves a much more articulated functional structure. The structure in (9) suffices for our present purposes. In Sect. 5.3 we present the more articulated TP structure proposed by Pearson.

Like Guilfoyle et al., Pearson assumes that the base order of constituents within VP is SVO. And he also follows Guilfoyle et al. in proposing that Malagasy voice morphology is case-related. On Pearson's account, however, the voice morphemes reflect the case of the position from which the operator has moved: AT morphology is realized on the verb when the operator raises from nominative case position to Spec WhP; TT morphology when it raises from accusative case position, and so on. On this analysis, voice morphology is the spell-out of the case features of an A'-chain, similar to the *wh*-agreement morphology found in a number of Austronesian languages, such as Chamorro (Chung, 1998). In Chamorro constructions involving A'-extraction, the normal person/number agreement morphology on the verb is replaced with special morphology indicating the grammatical function (subject, object, etc.) of the extracted element. Pearson proposes that voice marking in Malagasy (and other Philippine-type languages) is 'generalized' *wh*-agreement. In Chamorro this morphology is restricted to *wh*-questions and other marked constructions, while in Philippine-type languages it occurs on all verbs because of the requirement that Spec WhP be filled in all clauses. We thus take the voice morphology of Malagasy to be connected to a generalized version of the EPP that requires some clause-initial projection to have an overt element in its specifier. In this respect it is parallel to the tense/agreement morphology of the European languages which reflects the presence of an obligatory subject in Spec IP. This point will be important when we examine verb finiteness in the acquisition data.

Pearson shows that the trigger in Malagasy, as in (10a), shares important structural properties with clause-initial topics in V2 languages like German, in (10b).

(10)a. Tsy namaky (ny boky) **ny lehilahy**.
Neg pst.AT.read Det book Det man
 The man did not read the book.

b. **Der Mann** hat das Buch nicht gelesen.
The.nom man has the.acc book not read
 The man did not read the book.

First, Malagasy is like the V2 languages in that (virtually) every clause contains a predicate external A'-position that must be filled. Also, as noted above, the trigger, like the Germanic topic, must be definite and is associated with 'aboutness'.⁸

Another property that Malagasy shares with the V2 languages is an optional rule of topic/trigger drop. In informal registers in some of the Germanic languages a discourse salient pronoun may be omitted when it occurs in topic position. Deletion is possible with both subject and object topics, but crucially the rule affects only elements in topic position. A non-topicalized pronoun may not be dropped, as illustrated in the German sentences in (11), adapted from Huang (1984).

⁸ The topic hypothesis also provides an explanation for the fact that topicalization is blocked in clauses involving *wh*-movement because both operators occupy the same position. Pearson also provides evidence from binding to show that the trigger has properties of an A'-element while the non-promoted actor behaves like a subject. On Pearson's analysis a further parallel between Malagasy and the V2 languages is that the trigger-final word order is derived through the fronting of TP, which he treats as a phrasal movement analogue of T-to-C movement in the V2 languages. This is not directly relevant to the analysis of the voice marking or to the acquisition data.

- (11)a. (Ich) hab' *(ihn) schon gesehen.
 (I) have (him) already seen
 I already saw him.
- b. (Ihn) hab' *(ich) schon gesehen.
 (him) have I already seen
 Him, I already saw.

Pearson notes that a comparable pattern is observed in Malagasy. In informal conversation referential pronouns can be dropped, but only if they occur in trigger position, as illustrated in (12). In AT clauses a pronominal actor may be dropped, as in (12a), while pronominal theme may not, as in (12b). In TT clauses the opposite holds: a pronominal theme may be omitted, as in (12c), while a pronominal actor may not, as in (12d).⁹

- (12)a. Mamangy an'i Tenda (**izy**).
AT.visit obj-Det Tenda 3rd per.
 (He) is visiting Tenda.
- b. Mamangy *(azy) **i Naivo**.
AT.visit 3rd per. Det Naivo
 Naivo is visiting (him).
- c. Vangian' **i Naivo** (**izy**).
TT.visit Det Naivo 3rd per.
 (Him), Naivo is visiting.
- d. Vangian- *(-ny) **i Tenda**.
TT.visit 3rd per. Det Tenda
 Tenda, (he) is visiting.

Guilfoyle et al. do not discuss 'trigger drop.' However, because they place the trigger in Spec IP, their analysis entails that the omitted trigger is a null subject and hence that trigger drop is similar to the *pro*-drop found in Romance and other languages. The identificational requirements on the null trigger/topic—definite reference and discourse salience—also hold for the null subject (*pro*) in canonical null subject languages such as Italian. The null trigger phenomenon will figure prominently in our discussion of acquisition data in the next section.

At this point we have reviewed (albeit briefly) several aspects of Malagasy grammar that will be important to our discussion of the early grammar. Further details will be introduced as they become relevant. Let us turn then to the acquisition issues.

⁹ Omission of the pronoun in (12d) is grammatical only under the interpretation that Tenda is being visited by some arbitrary person. The omitted pronoun does not have the definite reading associated with the null topic.

3 Morphosyntactic development: cross-linguistic findings and predictions for Malagasy

In this section we discuss the acquisition findings on A- and A'-movement in other languages and also argument omission in early grammar and its relation to morphological specification on the verb. Based on the cross-linguistic findings we formulate several predictions that will allow us to determine the status of the trigger in Malagasy and the nature of the PTT operation as A- or A'-movement.

3.1 A versus A' movement

As noted above, there is robust evidence that the V2 parameter is set very early in development. In the grammars of children acquiring languages like Dutch, German, Icelandic and Swedish, finite verbs occur systematically in 2nd position (Becker & Hyams, 2000; Clahsen & Penke, 1992; Haegeman, 1995; Meisel & Muller, 1992; Poeppel & Wexler, 1993; Santelmann, 1995; Sigurjónsdóttir, 1999, among many others). Topicalization is also productive in the early Germanic grammar: In early German, Dutch and Swedish we find various elements in 1st position (Spec TopP), including subjects, objects, and adverbs, consistent with a rule of topicalization (de Haan & Tuijnman, 1988; Haegeman, 1995; Platzack, 1996; Poeppel & Wexler, 1993; Verrrips & Weissenborn, 1992). Some examples from German and Swedish child language are provided in (13) (German examples from Verrrips and Weissenborn (1992), Swedish examples from Platzack (1996)).

- (13)a. Bisschen hat der teddy auch German (Simone 2;0)
Little bit has the teddy too
The teddy has a little bit too.
- b. Da oben sind gummibärche.
there up-there are gummy bears
There are gummy bears up there.
- c. Ich will spielen. German (Kirsten 2;10)
I want play
I want to play
- d. Skärp har hon. Swedish (Embla 2;1)
belt has she
She has a belt.
- e. Så trevligt sa han.
so nice said he
He said it's so nice.
- f. Jag såg den inte.
I saw it not
I did not see it.

The evidence that children have an early topicalization rule becomes even clearer if we compare the rate of non-subjects in 1st position in finite clauses versus non-finite

Table 1 Subject initial and non-subject initial RIs and finite clauses

	Finite clause		RI	
	Subject	Non-subject	Subject	Non-subject
German	130	50 (28%)	24	0 (0%)
Dutch	1223	1346 (52%)	101	5 (5%)
Swedish	145	61 (30%)	147	1 (.6%)

German data from Poeppel and Wexler (1993), and Verrips and Weissenborn (1992), Dutch data from Haegeman (1995) Swedish data from Platzack (1992)

clauses, i.e. RIs. As noted earlier, various child languages show a robust RI stage, that is, a period during which infinitives freely occur in root clauses (Hoekstra & Hyams, 1998; Rizzi, 1994; Wexler, 1994, among many others). The RI phenomenon is illustrated in (14).

- (14)a. Papa schoenen wassen.¹⁰ Dutch
Daddy shoes wash-inf
- b. Auch Teddy Fenster gucken. German
also Teddy window look-inf
- c. Jag också hoppa där å där. Swedish
I also hop-inf there and there

In the verb final languages illustrated in (14a, b), the infinitive typically occurs in final position, reflecting the underlying SOV order of the German/Dutch clause. In RIs, there is neither V to C movement nor topicalization and the 1st position is occupied by the subject, consistent with the hypothesis that these are non-finite clauses. Table 1 above (from Hoekstra and Hyams (1998)) reports the proportions of subject-initial and non-subject-initial finite clauses and RIs in Dutch, German and Swedish child language (Table 1).

Although subject topics predominate in finite clauses (except in Dutch), there are also a substantial number of non-subject topics, in contrast to the RI situation. The proportion of finite clauses with non-subject topics ranges from 28% (50/180) in German¹¹ and 30% (61/201) in Swedish up to 52% (1345/2569) in Dutch.¹² If the Malagasy trigger is a topic, parallel to the V2 languages, then we expect a very early development of the PTT operation. Moreover, PTT should occur in both AT and TT clauses giving rise to actor and theme topics, consistent with the behavior of children acquiring V2 languages.

In marked contrast to the early emergence of A'-movement, A-chain formation of the sort associated with passives is a relatively late development (Bever, 1970; Borer & Wexler, 1987; de Villiers, 1985; Horgan, 1978; Maratsos, Kuczaj, Fox, & Chalkley, Meints 1999). Many studies of English acquisition have shown that children do not

¹⁰ In cases in which we are not certain of the intended meaning of a child utterance we have provided only glosses and not translations.

¹¹ The 28% non-subject topic rate is reported both for Andreas (Poeppel & Wexler, 1993) and Simone (Verrips & Weissenborn, 1992; see also Boser, 1997).

¹² The topicalized element may be overt or null. In examples such as (15) (below) the verb precedes the subject (VS), showing that there is a dropped object topic. In the earliest transcripts non-subject topics are most often dropped (Haegeman, 1995). We return to the phenomenon of topic drop below.

have full comprehension of verbal passives until quite late in development (roughly age 4–5), and that the frequency of spontaneous verbal passives—and especially the use of the *by*-phrase—is quite low.¹³ Mills (1985) and Abbot-Smith and Behrens (2005) report similar results for German, Verrips (1996) for Dutch, Sugisaki (1997) for Japanese, and Djurkovic (2005) for Serbian. Murasagi (2000) shows that by age three Japanese-speaking children have perfect comprehension (100% correct performance) of scrambling (A'-movement), but show mixed results for passives. In a seminal paper, Borer and Wexler (1987) argued that young children do not produce or understand verbal passives because the early grammar does not represent A-chains, a capacity that matures at around 4–5 years. They further proposed that prior to that age children have only adjectival passives, which do not involve A-chain formation. The A-chain deficit hypothesis (ACDH) is also argued for in Babyonyshev, Ganger, Pesetsky, & Wexler (2001).¹⁴

The ACDH is not uncontroversial. The arguments against it have come from two directions. Several studies have argued that children produce passives at a younger age than previously assumed. Other studies agree that passives are a late development, but show an early development of other structures involving A-chains. In the following section we briefly review these results. We then propose a version of the ACDH which we believe to be more in line with the available crosslinguistic data.

3.1.1 Do young children have A-chains?

The various studies that purport to show that children have verbal passives at an early age are amenable to the adjectival analysis proposed by Borer and Wexler, or other non-movement analyses. For example, in an elicited production task Meints (1999) found that 2-year olds correctly produced passives about 10% of the time and 3-year olds about 30% of the time. However, she shows that “prototypical” passives, i.e., those involving actional verbs and affected patients (e.g. *The postman was bitten*), are acquired earlier than those involving non-actional verbs and unaffected patients (e.g. *The postman was seen*). This is in line with earlier findings (e.g. Maratsos et al., 1985). Although Meints does not discuss the ACDH, her findings are consistent with Borer and Wexler’s claim that the first passives are adjectival and hence do not involve A-chain formation.

¹³ In contrast to these studies, Fox and Grodzinsky (1998) found that English-speaking children (ages 3;6–5;5) performed perfectly on long actional passives (e.g. *The boy is getting/being touched by the magician*) and all truncated passives, but showed chance performance on long non-actionals (e.g. *The boy is seen by the horse*). We note, however, that their results, though suggestive, are based on a very small sample of only eight children and have not been replicated in other studies.

¹⁴ Babyonyshev et al. (2001) propose another possible interpretation of the delay in the acquisition of passives, viz. that the early grammar requires an external argument. This requirement conflicts with the Theta-Criterion which blocks passives from having an external argument, and thus passives have no possible representation in early grammar. This account would predict that AT and TT voices are equally accessible because an external argument is represented in both cases. (Thanks to L. Travis for pointing this out to us). More recently, Wexler (2004) abandons the A-chain maturation theory of late passives in favor of an account in terms of phase theory (Chomsky, 1999). He proposes that passives are a late acquisition because vP is a strong phase in the early grammar (and not defective, as in adult grammar). Given the Phase Impenetrability Condition (Chomsky, 1999), extraction of the object out of vP is blocked. Like the A-chain maturation account, the phase analysis also predicts that TT voice will be a late development in Malagasy. In contrast, PTT in AT clauses is expected because the agent is at the edge of the vP phrase.

Similarly, Abbot-Smith and Behrens (A&B) (2005) show that in the spontaneous speech corpora of the German child Leo (age 2;2 to 4;11), *sein* 'be' passives are acquired earlier than *werden* 'become' passives (though the frequency of both types is very low overall; under 1.5% of Leo's main verb constructions are passives). A&B propose that *be* passives are an earlier acquisition because the child bootstraps from the lexically and morphologically related copula constructions (e.g. *sein* + NP, *sein* + adjective, *sein* + locative). Although A&B do not propose that the early passives are adjectival, their findings and analysis are entirely compatible with this hypothesis (see Bryan, 1995).¹⁵

Pye and Poz (1988) report that children acquiring Kiché produce passives between 2 and 3 years old. They note, however, that passives are rather infrequent overall and those that occur are mainly truncated passives, that is, passives without an expressed *by*-phrase. Truncated passives are consistent with the adjectival analysis proposed in Borer and Wexler (1987).¹⁶

In a longitudinal study of the acquisition of Sesotho, Demuth (1989) reports that the children between the ages of 2;1 and 2;9 (roughly the period under investigation here), produced passives. However, according to Crawford (2004) the rate of passives in Demuth's corpus ranges from .4% to 1% (of all utterances) and is well below the 6% passive rate of adult Sesotho speakers. Crawford also shows that many of the passives are impersonal passives that do not require A-movement. Finally, she points out that the children in Demuth's study do not systematically alternate between passive and active forms and hence that the early passives are possibly lexicalized forms. Crawford provides a plausible alternative to Demuth's A-movement analysis, arguing that the Sesotho early passives are adversity passives that have applicative syntax and do not involve A-chain formation.

In a similar vein, Allen and Crago (1996) claim that Inuktitut-speaking children have productive passives by around age 2;0. They show that passives occur more frequently in the Inuktitut input than in the input to English-speaking children and suggest that the acquisition of passives may be a function of the input frequency. However, Johns (1992) provides morphological and syntactic evidence that the 'verbal passive' in Inuktitut is actually formed by a process of nominalization and predication and does not in fact involve A-chain formation.

Although there have been various challenges to the hypothesis that verbal passives are a late development, these findings either do not stand up to empirical scrutiny or are consistent with alternative analyses that do not involve A-chain formation. The bulk of cross-linguistic evidence shows that true verbal passives are not acquired prior to 4 or 5 years. This said, it must also be noted that children's difficulties with verbal passives do not extend to other structures involving A-chains. For example, Italian and French-speaking children have correct auxiliary selection for unergative and unaccusative verbs including reflexives, implicating knowledge of A-chains (Hyams & Snyder, Submitted; Snyder, Hyams, & Crisma, 1995). Similarly, raising structures

¹⁵ Cf. Kratzer (2000) who argues that German *sein* passives are adjectival. Abbot-Smith and Behrens consider input frequency factors as well. We return to this in Sect. 6.

¹⁶ Of the passive examples presented by Pye and Poz only two are clearly full passives, i.e. with the external argument expressed, and both are uttered by the same child, Al Cha (Rosario). Pye and Poz also claim that some of the passives are formed with "non-actional" verbs, which would be inconsistent with the adjectival analysis proposed in Borer and Wexler. However, only 2 of the verbs listed, *see* and *smell*, are non-actional in the sense intended by Borer and Wexler. We are grateful to Pam Munro and Pedro U. Garcia Mantanic for their help with the Kiché data.

including raising of VP-internal subjects and subject raising out of small clause complements to copula *be* are also not problematic.¹⁷ Descriptively speaking, the child's difficulty seems to be with a specific type of A-chains, those that derive a misalignment of thematic and grammatical hierarchies. This is the case for verbal passives, which involve a promotion of the *theme* to the external argument position.

3.1.2 Canonical alignment hypothesis

In (15) we propose the *Canonical Alignment Hypothesis* (CAH). The CAH states that in the early grammar the external argument (if there is one) necessarily maps onto subject position (Spec IP). Thus, our hypothesis is that children do not lack the ability to form A-chains per se, but that the linking rules that map theta roles onto argument positions are more rigidly adhered to than in the adult grammar.

(15) *Canonical alignment hypothesis (CAH)*: Children cannot form A-chains that derive a misalignment of thematic and grammatical hierarchies; i.e., an external argument (*agent, experiencer*), if there is one, maps onto the subject (Spec IP or TP).

This formulation of the restriction on chains in early grammar is narrower and weaker than the ACDH. However, it has the virtue of making the proper cut in the empirical data: verbal passives are blocked while actives, adjectival passives, subject raising, and unaccusatives (which have no external argument) are predicted to be unproblematic, as is indeed the case. However, the question arises as to why there should be such a constraint in the child's grammar but not in the adult grammar. We suspect that the reason may be related to a more general property of the language faculty, but we will not discuss this issue further here.¹⁸ We will assume, then, that the early grammar cannot form A-chains that violate the canonical assignment of agent to external argument position.

3.1.3 Predictions for Malagasy

Returning to Malagasy, according to the subject hypothesis the TT voice in Malagasy involves a non-canonical alignment of the sort just described. In the structure

¹⁷ In recent work, Hirsh and Wexler (to appear) show that children up to the age of 7 fail to understand subject raising cases such as *Marge seems to Homer to be pushing a shopping cart*. On the other hand, Becker (2005, to appear) shows that 3 and 4 year olds correctly interpret sentences such as *The dog seems to be purple*. She further shows that the children are not assigning a control analysis to such cases. Because the Hirsch and Wexler sentences introduce a complexity (the dative object) not present in the Becker sentences, we find the Becker results more compelling. We note also that children use semi-auxiliaries *have to, be going to* before the age of 3, which are raising verbs on various analyses (see Hyams, 1986). However, it is clear that further studies need to be done on children's production and comprehension of raising structures.

¹⁸ It is possible that the CAH is part of a broader hypothesis about the architecture of the language faculty along the lines proposed in Williams' (2003) representation theory. Williams proposes that syntax economizes on 'shape-distortion', rather than 'distance minimization'. Thus, the thematic domain [Agent [pred Theme]] is mapped isomorphically onto the case domain [NP_{nominative} [V NP_{accusative}]], preserving both hierarchical structure and linear order. In certain cases, as for example in the formation of passives, structural shape may be distorted at one level in order to satisfy mapping at a different level. Thus, the mapping between thematic and case levels in passives results in non-isomorphic structures because the mapping between the case domain and surface structure needs to be isomorphic. The absence of verbal passives in early language (and their occurrence in adult language) would suggest that children adhere more strictly to 'shape preservation' than adults, who have greater pragmatic and processing resources.

proposed by Guilfoyle et al., the theme is raised to the Spec IP position (5). On the other hand, the AT voice involves movement of a VP internal actor/experiencer to the canonical subject position and so this kind of chain should not be problematic. If non-canonical mapping is blocked in the early grammar, as described in (15), we predict a significant delay in the acquisition of TT structure relative to AT structures.¹⁹

The subject hypothesis and the topic hypothesis for Malagasy make very different predictions concerning the child's acquisition of the different voice types. The topic hypothesis leads us to expect that children will develop AT and TT (i.e., PTT of actor and theme) clauses at roughly the same point in development, and that this should be rather early (age 2–3), just as Germanic-speaking children have subject/object topics. In contrast, if the subject hypothesis is correct and TT clauses involve a non-canonical alignment of a theme theta role and external argument position, we expect a significant delay in the appearance of TT voice relative to AT voice, as is the case for verbal passives in other languages; that is, we expect to find that in the early stages of development PTT will target actors but not themes.²⁰

The two hypotheses also make different predictions with respect to the circumstantial voice (CT). All else being equal, the topic hypothesis predicts an early development of CT structure (promotion of obliques) while the subject hypothesis predicts a long delay relative to AT voice. However, all else is not really equal because the CT is more complex in both its morphology and its syntax. (We return to a more detailed discussion of the CT structure in Sect. 6.) The topic analysis thus leads us to expect that the CT will emerge later than the AT and TT voices (AT, TT < CT). The subject hypothesis leads to the expectation that the AT will emerge first and that the TT and CT will be later acquisitions, (AT < TT/CT), though the prediction regarding relative order of the latter two is unclear.

3.2 Argument omission and verb finiteness in early grammar

The next predictions involve argument omission in the early grammar. We noted in Sect. 2 that in Malagasy the trigger may be dropped under appropriate discourse conditions. Pearson argues that trigger omission is parallel to topic drop in the Germanic languages. An alternative possibility is that trigger omission involves a null pronominal in Spec IP, structurally analogous to the null subject of the Romance languages. This latter proposal is entailed by Guilfoyle et al.'s subject hypothesis. As we noted earlier, the development of argument omission and related morphosyntax in the V2/topic drop languages (e.g. German and Dutch) and null subject languages (e.g. Italian and Spanish) has been widely studied and hence these languages provide

¹⁹ Should the Fox and Grodzinsky results (see note 13) hold up under further empirical testing, they can be accommodated by revising the CAH so that it applies only when the external argument is overtly expressed, viz. an *overt* external argument maps onto subject position. This revised formation would also be consistent with the finding of Okabe and Sano (2002), who show that Japanese children perform at chance with long actional passives (consistent with all studies except Fox and Grodzinsky), but that their short passives have implicit agents (see also Verris, 1996).

²⁰ An alternative analysis of Malagasy voice is proposed in Keenan and Manorohanta (2004) which involves neither A- nor A'-movement. On their analysis AT and TT do not have a common underlying representation, in contrast to both the topic and subject analyses discussed here. The voice affixes are expressions that combine with roots to directly build different structures. Thus, on this approach AT and TT clauses are equally (morphologically) complex and hence predicted to co-occur in acquisition. This and other acquisition implications of the analysis are discussed in Keenan and Manorohanta.

a model for the development of Malagasy under the two hypotheses we are considering.

There is a constellation of properties associated with the development of V2/topic drop languages that distinguishes it from the development of null subject languages. First, children acquiring topic drop languages often omit the topic in finite clauses (Boser, 1997; de Haan & Tuijnman, 1988; Haegemann, 1995; Santelman, 1995, among others). Topic drop in child language, as in adult language, targets various constituents including subjects and objects, as illustrated in (16).

- (16)a. Ga die weer maken. (Dutch)
go these again make
 (I) go make these again.’
- b. Moet ik gepakt.
must I made
 I must make (it).
- c. Lekte me tåget (Swedish)
played with the train
 (XX) played with the train.
- d. Tor jag inte.
believe I not
 I don’t believe (it).
- e. Will trinken. (German)
Want to drink
 (I) want to drink.
- f. Hab ich (ge)funden.
Have I found
 I have found (it).

There are not many quantitative studies of topic drop in child language. However, Haegeman calculates the rate of subject topic drop for the Dutch child Hein at 32%. She also reports that of the 1,346 sentences with post-verbal (i.e. non-topicalized) subjects in Hein’s corpus, the non-subject topic (which includes both object and adverbial topics) was realized 500 times. This would put the rate of topic drop for non-subject topics at around 63%. Children and adults differ with respect to topic drop in that children omit topics in contexts that would not be possible for adult speakers; that is, in contexts in which there is no obvious discourse antecedent (Santelmann, 1995 (Swedish); de Haan & Tuijnman, 1988 (Dutch); Verrips & Weissenborn, 1992 (German)). It seems likely that the children have acquired the syntax of topicalization and topic drop but not the interface condition that requires that the null topic be identified by a discourse antecedent.

In the Romance null subject languages, in contrast, there is no topicalization and hence no topic drop. Rather, children acquiring null subject languages omit subjects and do so in proportions roughly equal to adult speakers (Rizzi, 1999; Valian, 1991). Some examples are provided in (17) (from Salustri, 1998).

- (17)a. Lo naccondi su? (Martina 1;8)
it- hide-2nd sing. up
 Are you hiding it up (stairs)?
- b. Posso entrare? (Martina 1;10)
can-1st sing. enter
 Can (I) enter?
- c. Andiamo (a) Pisa. (Guglielmo 2;5)
Go-1st pl. to Pisa
 (We) are going to Pisa.

There are various properties that distinguish topic drop from *pro*-drop in adult and child language. Topic drop targets subjects and objects (and adverbs) while *pro*-drop targets only subjects; topics are dropped only from 1st position while null subjects occur in *wh*-contexts and embedded contexts (see Rizzi, 1999 for discussion).

It has also been observed that children acquiring V2/topic drop languages frequently omit *wh*-operators, as illustrated in (18). *Wh*-drop occurs in Dutch (Hoekstra–Hyams, 1997; Thrift, 2003), Swedish (Santelman, 1995) and German (Felix, 1980). No such phenomenon has been reported for the null subject languages (see for example, Guasti, 1999).

- (18)a. Försöket hon göra? (Swedish, Ask 2;7)
tries she do
 (what) is she trying to do?
- b. Doen de konijnen op de fiets? (Dutch, Gijs 2;6)
Do the rabbits on the bike
 (What) are the rabbits doing on the bike?
- c. Kommt der Pappi denn? (German, Bernie)
Come the daddy then
 (When) does daddy come?

Perhaps the most significant difference in the development of V2/topic drop languages and null subject languages is that V2 languages show an RI stage while null subject languages do not (Berger-Morales, Salustri, & Gilkerson, 2005; Guasti, 1993/1994; Rhee & Wexler 1995; Sano & Hyams 1994; Santos, p. c.). Thus, in languages such as Italian, Spanish, Catalan and Portuguese we find few examples of the sort in (14). The rate of RIs in these languages is typically under 10% while in the V2 languages RIs comprise between 40% and 50% of verbal utterances (see Hoekstra & Hyams, 1998 for an overview). The generalization that *pro*-drop languages do not show an RI state is not based solely on the Romance languages. Children acquiring Hungarian and Slovenian, both *pro*-drop languages, also fail to show an RI stage. The percentage of RIs in these two languages is under 2% (Londe, 2004; Rus & Chandra, 2005).²¹

²¹ There are three apparent counterexamples to the generalization that *pro*-drop languages do not show an RI stage. Pye (2001) claims that children acquiring Kiché, a *pro*-drop language, exhibit an RI stage. In Kiché, aspect and agreement morphology is prefixal and Pye mentions that children typically

Many syntactic properties distinguish RIs from their finite counterparts. One that is particularly relevant to the present discussion is that RIs typically occur with null subjects. The RIs in (14) contain overt subjects, but much more common are examples such as those in (19).

- (19)a. Ook koek hebben. (Dutch, Hein 2;6)
also biscuit have-inf
- b. Wasser holen. (German, Andreas 2;1)
Water get-inf
 He is getting water.
- c. Bygge tåg. (Swedish, Markus 1;10)
build-inf. train

In Table 2 we report the rate of “subject” omission in finite clauses (i.e. null topics) and RIs in several of the V2 languages (from Rasetti, 1999).²²

Across children and languages, subject omission in finite clauses (topic drop) averages around 23% while the average rate of subject omission in RIs is 70%. There is some variation both across languages (e.g. Dutch vs. Danish) and across children acquiring the same language (e.g. Anne and Jens). This variation is most likely due to a combination of factors including individual differences in the linguistic level and discourse style of the children and also differences in coding conventions adopted by the investigators.

Summing up, there are three kinds of null arguments in early child grammar. First, there is the null subject of finite clauses (see (17)), standardly referred to as *pro*, that occurs specifically in child null subject languages such as Italian and Spanish. This element has roughly the same frequency and distribution as in adult null subject languages (Rizzi, 1999; Valian, 1991). Second, there is a null topic of finite V2 clauses in

Footnote 21 continued

produce only the last syllable of the verbal complex. This suggests an alternative explanation for the Kiché bare verbs as involving phonological reduction rather than underspecification of a verbal functional projection. (Phonological omission is discussed in more detail in Sect. 5.2). Furthermore, the verb always moves to T, even when tense morphology is absent, as evidenced by the fact that negation always follows the verbal complex. Finally, the existential/copular verb *k'oolik* is almost never dropped, as is typical in RI languages. Therefore, we do not think that Kiché presents a strong counterexample to the generalization that null subject languages do not have an RI stage.

Swahili is a null subject language and children do produce bare verbs illustrated in (i), which Deen (2005) analyses as an RI analogue. Following Barrett-Keach (1986) and Buell (2002), we assume that Swahili subject agreement, object agreement and tense markers comprise a separate Aux constituent, as in (ii), which children omit during the bare verb stage. The Swahili bare verb is thus analogous to the Italian bare participle, as in (iii), and not a non-finite main verb, as is found in the Germanic languages.

- (i) Ø- Ø- ka a hapa (child)
a- na- ka a hapa (target)
SA3 PRS live IND here
- (ii) [_{Aux} a-na-] ka ahapa (Barrett-Keach, 1986; Buell, 2002)
- (iii) Disegno cascato
picture fallen
 The picture has fallen

A bare participle analysis is also available for the ‘bare subjunctive’ form used by Greek children, e.g. *Pío vavási* ‘Spiros reads’ (Varlokosta, Vainikka, & Rohrbacher, 1998), but cf. Hyams (2002).

²² In this discussion and in Table 4, ‘subject omission’ is neutral between a null subject and null topic analysis. It refers simply to the omission of the external argument.

Table 2 Rate of subject omission in finite and non-finite clauses

Language	Child	Clause type	
		Finite	RI
<i>Flemish</i> (Krämer, 1993)	Maarten	25% (23/92)	89% (89/100)
<i>Dutch</i>	Hein	32% (1199/3768)	85% (615/721)
(Haegeman, 1995)	Thomas	28% (165/596)	92% (246/267)
<i>Danish</i>	Anne	11% (366/3379)	59% (394/667)
(Hamann & Plunkett, 1998)	Jens	23% (742/3173)	58% (539/937)
Total		23% (2495/11008)	70% (1883/2692)

Table 3 Argument omission and RI properties of developing NS and V2 languages

	NS language	V2 language
Pro	+	–
Null topic	–	+
RI	–	+
PRO	–	+
<i>Wh</i> -drop	–	+

the Germanic languages (see (16)). The null topic can be a subject, object, or other XP and occupies the highest specifier position in the CP domain (first position in the V2 languages). Finally, there is the null subject that is licensed in non-finite root clauses (see (19)) in the RI languages, which we will refer to as PRO (Sano & Hyams, 1994), also restricted to initial position, which is to say it does not appear in *wh*-questions, as first observed by Roeper and Rohrbacher (2000). The different properties of early null subject languages and V2 languages are summarized in Table 3.

3.3 Predictions for Malagasy

As we discussed earlier (Sect. 1.1), the study of early grammatical development has profited enormously from the detailed investigation of different child languages, especially the Germanic and Romance languages. Developmental principles such as continuity, UPI and EMC lead us to naturally expect certain patterns of development in Malagasy. If Malagasy is a V2-like language, we expect one developmental trajectory. If, on the other hand, the trigger is a structural subject and PTT involves A-movement, we expect another. With this in mind, what do the properties in Table 3 imply for the acquisition of this language under the two hypotheses that we are testing? One obvious prediction stemming from the topic analysis is that Malagasy-speaking children will omit triggers in both AT and TT clauses, comparable to the subject and object topic drop we find in the developing V2 languages. Unfortunately, this test of the topic verses subject hypotheses of Malagasy is less straightforward than it seems at first glance. This is because the subject hypothesis also leads us to expect that Malagasy-speaking children will drop the trigger, in Spec IP by hypothesis, comparable to what we find in the developing null subject languages. Thus, trigger omission is predicted by both the topic and subject hypotheses.

However, the two hypotheses make very different predictions with respect to the relation between an omitted trigger and the finiteness of the verb, and a fortiori they also make different predictions with respect to the likelihood of non-finite root clauses.

RIs are not specifically associated with V2 languages. They also occur in non-V2 languages such as English, French, and Russian. However, every V2 language studied thus far shows an RI stage. RIs occur robustly in Dutch (Blom, 2003; Wijnen, 1997), German (Becker & Hyams, 2000; Poeppel & Wexler, 1993), Swedish (Josefsson, 2002; Platzack, 1996; Santelman, 1995), Norwegian (Plunkett & Strömqvist, 1990), and Icelandic (Sigurjónsdóttir, 1999). Conversely, there is no null subject language that shows an RI stage, whether of the Romance variety or as typologically diverse as Hungarian and Slovenian. Given that Malagasy exhibits argument drop, and therefore cannot be like English or French, there are only two available options for the language: If it is a null subject language, as per the subject hypothesis (see the null argument examples in (12)), we do not expect an RI stage and hence we do not expect any relationship between trigger omission and verb finiteness. If, on the other hand, Malagasy is a V2-like language, then we expect it to show the properties of an RI language. First, we should find non-finite root clauses, and second, the rate of null subjects in non-finite contexts should be significantly higher than in finite contexts. Malagasy does not have an infinitival form but the bare verb is arguably an RI analogue.²³

In (20) we summarize the three predictions that distinguish the subject hypothesis (SH) and the topic hypothesis (TH).

(20) The Subject Hypothesis

SH 1: AT voice is acquired before TT and CT voice

SH 2: As a null subject language, Malagasy will not exhibit an RI stage, i.e. there will be no non-finite root clauses, and hence:

SH 3: there will be no relationship between verb finiteness and trigger omission.

The Topic Hypothesis

TH 1: AT voice is acquired at the same time as TT voice (but possibly before CT voice).

TH 2: Malagasy will exhibit an RI stage, i.e. there will be non-finite root clauses, and

TH 3: the rate of trigger omission in non-finite clauses will exceed that of finite clauses (see Table 2).

In the following sections we present the details of our developmental study. Our goal is to show that when viewed against the background of development in other languages and with respect to certain general principles of morphosyntactic development, the empirical results have implications for the structural analysis of the voicing system in the adult language. We focus especially on the nature of the trigger (topic or subject) and the kind of syntactic operation involved in PTT (A- or A'- movement). Before turning to the results of our study, we present some background information on the children we studied, as well as the coding conventions we adopted.

²³ For example, in English the bare verb (e.g. *He lose it*, *He fall down*) shows properties of a non-finite form (Harris & Wexler, 1996; Hyams, 2005).

4 Subjects and coding conventions

The subjects of this study are three Malagasy-speaking children, Tsiorisoa, Sonia, and Ninie. All of the children were taped 3–5 times monthly over a 9-month period (from April to December 2000), with a one-month break for Tsiorisoa (2;6) and Ninie (2;2). Some of the sessions were rather short and thus we collapsed all recordings within a single month into a single file according to age. For example, Tsiorisoa was taped four times in April 2000. These four files are included in Tsiorisoa 2;0.

The three children in this study are from families that speak the Merina dialect spoken in and around the capital city of Antananarivo. Merina is also the basis for the standard written Malagasy and has been the focus of much of the linguistic research on the language. The children are from middle class urban families. Some of the parents are affiliated with the Université Nord in Antsiranana.

The ages of the children and the number of utterances in each taping session are given in Table 4. Also included in Table 4 is the Mean Length of Utterance (MLU) for the first and last sessions for each child. MLU is a gross measure of overall linguistic development.

The tapes were recorded, transcribed and independently coded by a native Malagasy speaker with extensive knowledge of the grammar of the language. A second speaker checked the coding while a third coder was called in as needed in cases where there was uncertainty about particular utterances.²⁴ The transcripts were coded for several grammatical properties. The properties relevant to the present study are provided in Table 5.

Table 4 Age, MLU and number of utterances

Tsiorisoa			Sonia			Ninie		
Age	MLU	Utterances	Age	MLU	Utterances	Age	MLU	Utterances
2;0	2.84	24	1;6	1.68	61	1;10	3.09	88
2;1		200	1;7		122	1;11		156
2;2		31	1;8		27	2;0		42
2;3		35	1;9		50	2;1		14
2;4		41	1;10		81	2;3		33
2;5		58	1;11		90	2;4		33
2;7		85	2;0		31	2;5		68
2;8	4.5	38	2;1		29	2;6	4.09	74
			2;2	3.46	107			
Total		512			598			508

Table 5 Coding

Grammatical property	Coded values
Tense	Past, Present, Future, Unspecified
Voice	AT-form, TT-form, CT-form, Root, Unspecified
Trigger	Actor-Trigger (AT), Theme-Trigger (TT), Circumstantial-Trigger (CT), Null-Trigger
Non-trigger Actor	Null, Overt

²⁴ The coders were Cecile Manoroahanta, a native Malagasy speaker, Dimitris Ntelitheos and Ed Keenan.

In coding the data we first identified the trigger, when overtly expressed, as the actor, theme, or oblique argument (CT). We also noted if the trigger was implied but not overtly expressed (null). As is standard in corpus studies, the reference of the null trigger was inferred from the linguistic and non-linguistic context. As described earlier, in the adult grammar the PTT of a verb dependent results in a specific voice morphology on the verb. This is often true in the child's grammar as well and we coded the form of the verb (AT, TT, CT) accordingly. When tense morphology was specified we noted the tense, whether past or future. However, because present tense is not overtly marked and the future morpheme is not pronounced in colloquial speech, past is the only tense that can be unambiguously coded in both AT and TT forms; children use past very infrequently.²⁵ Thus, systematic coding of tense was not possible and the results of the analysis not very informative.

As is familiar from the study of inflectional morphology in other child languages, in many instances the voice morphology was not specified on the verb. Because voice morphology is obligatory in the adult grammar except for those verbs that occur in a root form, it was easy to see when the child's form was not specified for voice. Recall that the AT form contains both the AT morpheme *m-* and another prefix *an-/i-* (see (4)). The AT morpheme *m-* and the *an-/i-* prefixes were coded separately. As it turned out, however, in virtually all cases of *an-/i-* omission, *m-* was also absent. We return to this in Sect. 5.3. It is also worth noting that when voice morphology was unspecified there was also no tense (*n-/h-*) specification. We refer to those forms that require voice/tense morphology in the adult grammar (i.e., are not root verbs), but are unmarked in the child data as 'bare verbs.' We return to this issue when we consider the question of whether Malagasy children go through a RI stage (Sect. 5.3).

In the adult grammar voice morphology together with word order (in contexts that are not pragmatically marked) is a clear indicator of which verbal argument is the trigger. When voice morphology was not specified on the child's verb, other diagnostics were used to determine the trigger, including pronominal case and linguistic and pragmatic contexts.

Pronominal case varies according to grammatical function. Consider, for example, the adult sentence in (21a), and compare this to the child's example in (21b).

(21)a. No-vono -in' i Omar **aho**. (Adult Form)
Pst-beat-TT/Lnk' Det Omar 1SG.NOM
 (As for) me, Omar beat (me).

b. Volo- n' Omar **da**. (Sonnia 26)
beat -Lnk Omar 1SG
 (As for) me Omar beat (me).

The verb in (21a) is in the TT form (*-in*) corresponding to the theme trigger, the object of the beating. Note also that the trigger is a nominative pronoun.²⁶ The non-trigger actor, *Omar*, is adjacent to the verb and connected to it by the linking morpheme *-n*, which identifies Omar as the non-promoted actor. In the child's example

²⁵ The unambiguous Past tokens (the ones that carry the past prefix *n-*) in both AT and TT forms number 91 out of 1444 total verbs (about 6%).

²⁶ Only pronouns are marked for case in Malagasy (and arguably proper names and some demonstrative pronouns are marked for accusative case). A pronominal trigger is nominative, a non-trigger pronominal theme is accusative, and a non-trigger pronominal actor is genitive. See Ntelitheos and Manorothona (2004) for discussion of the acquisition of the Malagasy pronominal system.

in (21b) the TT suffix is missing. The grammatical functions of the verb's dependents are nevertheless clear. The trigger, *da*, is a reduced (child) form of the strong 1st person nominative pronoun *izaho* (children sometimes use *za* as well) (Ntelitheos & Manoro-honta, 2004). And the non-trigger actor, *Omar*, is adjacent to the verb, and connected to it by *-n*, as in the adult grammar.

Some verbal forms are suppletive with different root forms for AT and TT contexts. For example, the children produced 11 tokens of the transitive verb 'bite' as *keke/kake* (adult *kekerina*). We took these to be TT forms even though the TT suffix (*-ina*) is missing, because the form is unique to TT contexts. In AT contexts the root is *kaikitra* (AT form *manakitra*) which is also produced by Tsiorisoa (2;8) (*manekts*, 3 tokens).

Given the children's tendency to omit voice morphology and verbal arguments, there were many cases in which identification of the voice and/or the trigger was not as straightforward. Ambiguous cases involved bare verbs followed by one or two arguments. A single-argument verb could be either an intransitive AT (in which case the meaning of the verb identified the thematic role/grammatical function of the single argument) or a transitive verb with a missing argument. The latter case could represent AT voice with the single argument functioning as the theme or the actor trigger, or TT voice with the argument functioning as the internal actor or the theme-trigger. This ambiguity carries over to bare transitive verbs with two arguments as they could be either AT forms followed by the internal argument and the actor trigger, or TT forms followed by the internal actor and the theme trigger. However, in almost all cases different kinds of information helped us identify the voice/trigger. Consider the following examples:

- (22)a. Vidi mofa papa (Tsiorisoa 2;1)
buy bread dad
- b. Adult: Inona no vidiana (ny mama-ny) ho anao?
What Foc buy.TT (Det mommy-3Gen) for you
 What was bought (by your mommy) for you?
- Child: Vidi farmaz. Sonnia(1;11)
buy cheese
 Cheese, (she) bought.

The sentence in (22a) was assumed to be AT voice ('as for Dad, (he) bought the bread') even though the verb lacks AT morphology (the prefixes *m-* and *i-*). If it were TT voice (*vidin*), given the word order, it would mean '(as for) Dad, the bread bought (him)' which is pragmatically unexpected. However, the situation becomes more complicated when only one argument is present. In these cases, word order does not help and the single argument can be an internal argument, actor-trigger, internal actor, or a theme-trigger. However, even in these cases it was almost always possible to determine the voice/trigger from the preceding discourse. As we discuss in Sect. 6, adult utterances in our data are mainly *wh*-questions addressed to the children. In almost all non-pragmatically marked cases in the adult language the voice specification of the answer to a *wh*-question is identical to the voice specification of the *wh*-question itself: TT questions are followed by TT answers, AT questions by AT answers. It is natural to assume a similar pattern for child language and the few child utterances that have overt voice morphology meet this expectation. Therefore, we marked child utterances following adult questions accordingly when they lacked overt voice morphology. Consider (22b). The single argument *farmaz* in Sonnia's

utterance could bear any of the roles discussed above. However, given the preceding question, the verb is identified as a TT form and for pragmatic reasons the single argument can only be identified as the trigger. Finally, the preceding context was also the main indicator of voice morphology on verbs accompanied by no arguments at all. There were only a handful of sentences (around ten) in which it was impossible to identify the voice/trigger through linguistic or extra-linguistic means. These sentences were excluded from our analyses.

5 The acquisition results: testing the predictions

We turn now to the results of our developmental study testing the various predictions in (20). We begin by presenting the kinds of voice structures that are found in our acquisition data. This will allow us to test hypotheses SH 1 and TH 1. We then turn to argument omission.

5.1 The order of acquisition of the different voices

Table 6 shows the frequencies of the different voice types for each of the three children over the entire set of data points for each child. This classification is based on the criteria discussed in the coding section. This table includes all utterances in which we could identify the trigger, including verbs with overt voice morphology, verbs that occur in root form in the adult language, as well as the bare verbs that occur in child language, which would require voice morphology in adult Malagasy.

The results show that all the children produced both AT and TT clauses. Examples are provided in (23) and (24).

AT voice

- (23)a. M -i -ants tsoso. (Tsiorisoa, 2;3)
AT-PFX-study Tsiorisoa
 Tsiorisoa studies/is studying.
- b. M-an-ao kapa, kapa nonia. (Sonnia, 2;2)
AT-PFX-put shoes shoes Sonnia
 Sonnia is putting (her) shoes on.
- c. Tsy m-an-deha io. (Ninie, 2;4)
NEG AT-PFX-go this
 This is not working.

Table 6 Frequency of different voice types

	AT	TT	CT
Tsiorisoa	361 (75%)	115 (24%)	3 (.06%)
Sonnia	274 (69%)	122 (31%)	3 (.07%)
Ninnie	309 (59%)	212 (41%)	1 (.02%)
Total	944 (67.5%)	449 (32%)	7 (.05%)

- d. N-i-tomany aho. (Tsiorisoa, 2;7)
PST-PFX-cry I
 I cried.

TT voice

- (24)a. Tsy me -ny Tsiosoa. (Tsiorisoa, 2;7)
NEG give-TT Tsiorisoa
 As for T, (it) wasn't given (to him).
- b. Bala-k i neny. (Ninie, 2;1)
tell.TT-I DET mom
 As for mom, (she) is/will be told by me.
- c. Tapo nena nonia. (Sonnia 1;10)
beat mommy Sonnia
 As for Sonnia, mommy beat her.

In order to determine whether the different voice types were productive, we calculated the number of different verbs that occurred with both AT and TT morphology. A difficulty in carrying out this kind of analysis is that in Malagasy eventive verbs (activities, accomplishments) and highly transitive verbs occur almost exclusively with TT morphology, while states (and intransitive verbs) are mainly expressed with AT verbal forms. These tendencies are a property of both the child and the adult language (see Hopper & Thompson, 1980). The three children produced 56 different verbs in TT contexts and 46 different verbs in AT contexts. Of the 46 AT verbs, 15 are states (translated in English as 'is thirsty', 'is dirty', 'is nasty', and so on), which occur exclusively in AT form in both child and adult language. Three other verbs are auxiliaries that also appear exclusively in AT contexts and one is the existential *misy*, 'exist'. Of the remaining 27 AT verbs most are intransitives ('sleep', 'arrive', 'laugh', and so on), which do not have a TT form, and around 10 are transitive verbs. On the other hand, all TT forms are transitive or ditransitive verbs, as expected. Table 7 lists several verbs that occurred in both AT and TT form, the age of first occurrence with the alternative voice morphology, and the number of fully inflected AT and TT tokens attested in the data.

Table 7 shows that—modulo biases that are also part of the adult language—the children use individual verbs in both AT and TT voice, a hallmark of productivity.

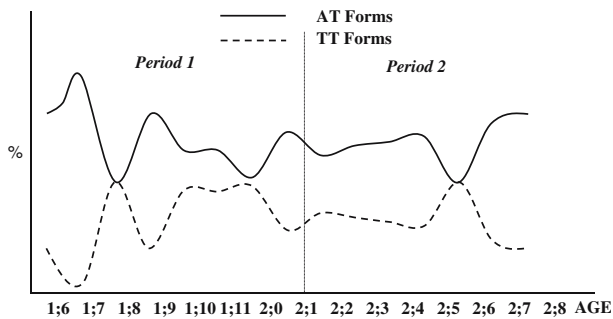
The topic hypothesis (TH 1) predicts the occurrence of both clause types while the subject hypothesis (SH 1) predicts that there will be virtually no TT clauses at this early stage because under this hypothesis PTT involves the promotion of theme to

Table 7 Verbs alternating between AT and TT morphology

Verb	Gloss	First occurrence	AT tokens	TT tokens
manome, AT/omena, TT	'give'	Tsiorisoa 2;1	5	31
mihinana, AT/hanina, TT	'eat'	Sonnia 1;11, Ninie 1;11	29	5
mividy, AT/vidina, TT	'buy'	Sonnia, 2;1, Ninie, 2;3	14	6
manaikitra, AT/kekerina, TT	'bite'	Tsiorisoa, 2;8	1	7
mikapoka, AT/kapohina, TT	'beat'	Tsiorisoa, 2;5	1	13
manao, AT/atao, TT	'make'	Sonnia, 2;2	10	14

Table 8 Proportion of voice type by age

Child	Period 1 (1;7 – 2;1)		Period 2 (2;2 – 2;8)	
	AT	TT	AT	TT
Tsiorisoa	121 (76%)	39 (24%)	240 (76%)	76 (24%)
Sonnia	199 (72%)	76 (28%)	75 (62%)	46 (38%)
Ninie	177 (59%)	121 (41%)	132 (59%)	91 (41%)
Total	497 (68%)	236 (32%)	447 (68%)	213 (32%)

**Fig. 1** Percentage of voice type for all children at each data point

Spec IP; that is, a passive-like operation. It is important to note these children are under 3 years old, an age during which passives are rarely, if ever, found in the other languages that have been studied. Thus, the results in Table 6 clearly support the topic hypothesis. The Malagasy-speaking children behave like children acquiring V2 languages, who produce both subject and object topics at an early age. The AT rate is higher than the TT rate for all children. This is also in line with the results from the V2 languages in which subject topics are much more frequent than object topics (see Table 1).

There is, however, a question of whether the higher AT rate in Table 6 is a developmental effect indicating a greater difficulty (and hence delayed development) of TTs, or a pragmatic preference of the Malagasy speaker. *Prima facie*, a developmental effect is suggested by the individual differences among the three children. The AT clauses occur much more frequently than the TT clauses in Tsiorisoa's and Sonnia's data while for Ninie the percentages are much closer. In terms of MLU (Table 4), Ninie is the most linguistically advanced of the three children. And this might also suggest that the ATs are in fact an earlier acquisition. To check this hypothesis we divided the children's data into two periods, an early period from age 1;7 to 2;1 and a later period from age 2;2 to 2;8 and calculated the percentage of voice types at the two stages. These results are given in Table 8 and Fig. 1.

We see no change from the early to the late period. Collapsing across the three children, AT clauses occur at a rate of about 68% in both Period 1 and Period 2, and TT clauses at a rate of 32%. Therefore, it is not the case that TTs are a later development. Rather, the higher proportion of TTs in Ninie's data seems to be simply an individual preference.

Table 9 Frequency of voice types in adult, child, and child directed language

Voice type	AL*	Child	CDL
AT	5601 (62.3%)	944 (68%)	294 (61.9%)
TT	1846 (20.5%)	449 (32%)	174 (36.6%)
CT	1532 (17%)	7 (.05%)	7 (1.4%)

*From Keenan and Mahorohanta (2001)

We propose that the higher rate of AT forms in the children's data reflects a pragmatic bias of the Malagasy speaker (whether child or adult). To test this we compared the children's AT and TT rates to those of adult speakers in two separate analyses. We compared the child frequencies to the frequency of the different voice types in adult-to-adult language (henceforth AL) and also to the frequencies of the different voice types in child-directed adult language (henceforth CDL). Because we did not have transcripts of adult (to adult) discourse we relied on Keenan and Manorohanta's (2001) calculations of the frequencies of the different voice types in AL Malagasy. Keenan and Manorohanta's data are based on two romance novels.²⁷ Because these novels are very colloquial and contain large amounts of dialogue they are assumed to be representative of the spoken language. The figures for CDL were calculated on the basis of the adult tiers in our acquisition data. Table 9 presents these comparisons.²⁸

Comparing the children and the adults, we find no strong developmental effect with respect to AT and TT voice types. The children produce AT clauses in proportions roughly equal to the adults (68% vs. 62%). Interestingly, adults produce AT clauses with almost exactly the same frequency in AL and in CDL. The proportion of TT clauses in the child data is somewhat greater than in AL (32% vs. 20.5%), but it is fairly close to the proportion of TT clauses in CDL (36%). It seems fair to conclude that children are not behaving very differently from adults with respect to their production of AT and TT clauses. In adult Malagasy, AT clauses outnumber TT clauses. The null hypothesis is that whatever stylistic or discourse factors are responsible for the greater proportion of AT clauses in the adult language are also responsible for the higher proportions in the children's language.²⁹ Thus, contrary to the prediction of the subject analysis (see (21)), there is no support for the hypothesis that children have more difficulty with TT clauses or are delayed in their acquisition or use.

There is, however, one notable difference between children and adults, which is the almost complete absence of the CT in the children's data. There were only a handful of examples of CT clauses, most of which occurred in the last files (Tsiorisoa 2;6 and

²⁷ *Ilay Kintana Mamirapiratra*, 'That Shining Star', by Philippe Rajohanesa, Imprimerie Luthérienne, 1963 and *Ny Zanakano*, 'My Child', by Clarisse Ratsifandrihamanana, Imprimerie Nationale, 1969.

²⁸ The figures in Table 9 include imperatives. We included the imperatives in the child and CDL data in order to make these data comparable to the adult data in Keenan and Manorohanta.

²⁹ A factor that may have contributed to the higher proportion of ATs in both adult and child language was the inclusion in our counts of a class of auxiliary-like verbs (e.g. *avy* 'come', *lasa* 'gone', *tonga* 'arrive') (see (5b)) and intransitive verbs that have no TT counterpart. Because there is no TT option, this would artificially inflate the proportion of AT clauses relative to TT clauses. Thus, the relative proportion of TTs in the child data may be much higher than shown in the tables. The active auxiliaries and intransitives were included in order to make the child data comparable to the adult data in which the active auxiliaries were also included, so the proportion of TTs may also be higher in adult language.

2;8, Sonnia 1;11 and 2;2, Ninie 2;0). Adults, by contrast, produce circumstantials about 17% of the time when talking to each other. Interestingly, however, they do not use the CT when addressing children. We return to this issue in Sect. 6, where we address the possible effects of frequency on the order of emergence of the different voices.

5.2 Argument omission and verb finiteness

The next predictions concern the possibility of a non-finite verb stage in Malagasy, comparable to the RI stage in V2 languages. Under the topic hypothesis, Malagasy is a V2-like language and therefore we expect an RI stage. Under the subject analysis Malagasy is a null subject language and no RI stage is predicted. There are two sets of predictions: the topic analysis predicts non-finite verbs in root contexts and it predicts a contingency between the non-finite verbs and trigger omission. The subject analysis predicts no non-finite verbs and thus no possible contingency. Before turning to the verbal domain, we first establish that Malagasy-speaking children do in fact drop the trigger. Table 10 reports the rate of trigger omission in AT and TT clauses for the three children in our study. Imperatives are excluded from this analysis because the trigger (addressee) is unspecified in adult AT imperatives.³⁰

Collapsing across children, the trigger is dropped in 50% of both AT and TT clauses.

Turning now to the verbal domain, we observe that Malagasy-speaking children produce non-finite verbs and do so in significant percentages. Some examples are given in (25) and the quantitative results in Table 11.

- (25)a. Lomano za. (Adult: *m-i-lomano*) (Sonnia, 2;2)
swim ISG.STR
 As for me, (I) swim.
- b. Tata tana. (Adult: *m-an-asa*) (Sonnia, 1;11)
wash hands
 Wash hands.
- c. Kapo mama. (Adult: *kapoh-ana*) (Tsiorisoa, 2;7)
beat mommy
 As for (me), mommy beat (me).

Table 10 Rate of trigger omission in AT and TT clauses

	AT	TT
Tsiorisoa	143/341 (42%)	34/77 (44%)
Sonnia	146/264 (55%)	50/89 (56%)
Ninie	158/297 (53%)	60/123 (49%)
Total	447/902 (50%)	144/289 (50%)

³⁰ The totals for AT and TT in Table 10 are lower than in Table 9 because of the exclusion of imperatives from the analysis.

Table 11 Percentage omission of voice morphology in AT and TT clauses

	AT	TT
Tsiorisoa	120/309 (39%)	28/77 (36%)
Sonnia	120/241 (50%)	16/89 (18%)
Ninie	107/262 (41%)	40/123 (33%)
Total	347/812 (43%)	84/289 (29%)

Table 12 Frequency of null/overt triggers with finite and bare verbs

		Finite verb		Bare verb	
		Null	Overt	Null	Overt
Tsorisoa	AT	74 (40%)	110 (60%)	57 (46%)	66 (54%)
	TT	13 (37%)	22 (63%)	20 (80%)	5 (20%)
Sonnia	AT	61 (49%)	63 (51%)	75 (67%)	37 (33%)
	TT	31 (53%)	28 (47%)	18 (78%)	5 (22%)
Ninie	AT	87 (55%)	70 (45%)	58 (59%)	41 (41%)
	TT	13 (29%)	32 (71%)	23 (66%)	12 (34%)
Total		279 (46%)	325 (54%)	251(60%)	166 (40%)

We counted as non-finite any verb that lacked voice morphology, i.e. bare verbs.³¹ In the case of the AT voice the bare verb lacked both the *m-* and the *an-/i-* prefixes.³² We excluded from this analysis those verbs that occur in root form in the adult language (see (5)). Imperatives are also excluded because the TT imperatives do not carry voice morphology in the adult language.³³ Thus, we counted as non-finite only those bare verbs that are illicit forms in adult Malagasy and hence plausible RI candidates. Table 11 shows that, overall, children produce non-finite (bare) verbs 43% of the time in AT clauses and 29% of the time in TT clauses. These figures are somewhat lower than what is found in the Germanic RI languages, in which the RI rate is between 40% and 50%, but certainly far higher than the <10% typically found in the null subject languages (see Hoekstra and Hyams (1998) for an overview of RI rates).

The final step is to determine if there is a relationship between finiteness, i.e., the specification of voice morphology on the verb (Table 11), and trigger drop (Table 10). In Table 12 we report the frequency of null and overt triggers in bare and finite clauses. As in Tables 10 and 11, root verbs are excluded from the analysis because they carry no voice morphology in the adult language. Imperatives are also excluded because TT imperatives have no voice morphology and in AT imperatives the trigger is null in the adult language.³⁴

Averaging across the three children, finite verbs occur most frequently with overt triggers, viz. 54% of their triggers are overt, while the bare verbs occur most often

³¹ Although we are not considering tense morphology in our analyses for the reasons outlined earlier, we note that the bare verbs lacked tense morphology in addition to voice morphology.

³² As noted earlier (Sect. 3.1), the two AT prefixes were never independently specified in the child data, that is, there were no unambiguous present tense verbs with *an-/i-* prefix but which lacked *m-*. The omission rates for the AT prefixes were 44% for *m-* and 41% for *an-/i-*. The 3% of cases in which *an-/i-* appeared alone were ambiguous between a present tense reading (in which *m-* would have been dropped), or a future/irrealis meaning, in which there is an unpronounced future morpheme (*h-*).

³³ There is in fact some controversy about whether voice is marked on imperatives. We chose to err on the side of caution by eliminating the imperatives from our counts.

³⁴ We also excluded from Tables 12 and 13 bare verbs with strong 1st person singular (*izaho*) subjects. We discuss this point shortly.

Table 13 Frequency of null/overt triggers with bare AT/TT verbs

	Null trigger	Overt trigger
AT	190 (57%)	144 (43%)
TT	61 (73%)	22 (27%)

with null triggers, viz. 60% of their triggers are null. These results are in the direction predicted by the topic hypothesis.³⁵ However, the difference in overt trigger rates in finite and non-finite contexts is not as large as in the Germanic languages presented in Table 4. For this reason we wonder if there is some independent factor that contributes to the high rate of overt triggers. In what follows, we explore this possibility.

5.2.1 Factors contributing to the high rate of overt-triggers

It has been suggested that children drop inflectional morphology for either phonological or processing reasons or a combination of the two.³⁶ Gerken (1994), in particular, has proposed a metrical analysis according to which children, under production pressures, may drop weak syllables (in iambic feet). In addition, children learning Mohawk (Mithun, 1989) and Kiché Mayan (Pye, 1992) acquire the ends of words, especially suffixes, earlier than they acquire prefixes. Finally, there is experimental evidence that children find nonsense prefixes harder to produce than nonsense suffixes (Kuczaj, 1979). This evidence suggests a preference for suffixes over prefixes in the first stages of language development. Given that prefixes are prosodically independent from the stem in Malagasy (e.g. contrary to suffixes they do not participate in stress assignment) and the preference for suffixes in early developmental stages mentioned above, it is possible that Malagasy children drop (some) prefixes for phonological or processing reasons.

As noted in Sect. 2, Malagasy TT voice morphology is generally suffixal while AT voice morphology is prefixal (see (6)). Thus if prefixes are also being omitted for phonological/processing reasons this would increase the number of bare AT forms relative to TT forms. Indeed, as shown in Table 11, the rate of omission of voice morphology is 43% in the AT voice and 29% in the TT voice. A reasonable hypothesis is that some percentage of bare AT verbs are in fact “hidden” finite verbs, that is to say, clauses that are structurally finite in which the voice morphology is dropped in the phonology, in which case we would predict a higher proportion of overt triggers with bare AT verbs than with bare TT verbs. To test this prediction, we separately examined the rate of overt and null triggers in bare AT clauses as compared to bare TT clauses. These results, collapsed across the three children, are given in Table 13.

³⁵ The relationship between bare verbs and trigger omission is marginally significant ($P = .08$) by a Friedman chi-square.

³⁶ See note 21. We also thank Lisa Travis and an anonymous reviewer for suggesting that we look into this possibility for Malagasy.

Table 14 Distribution of *izaho* and *aho* with bare and finite verbs

	Finite	Bare
<i>aho</i>	40 (73%)	15 (27%)
<i>izaho</i>	5 (24%)	16 (76%)

In Table 13, the proportion of overt triggers is far higher with AT verbs (43%) than TT verbs (27%). This is consistent with the idea that some of the bare AT verbs really involve finite structures in which the voice morphology is dropped for phonological reasons. If we focus on the 73% rate of trigger omission for bare TT verbs (thus factoring out the possible hidden finite AT forms) this rate is directly comparable to the 70% average rate of null subjects in the RI languages (see Table 2).

With respect to the 27% of bare TT verbs with overt triggers (Table 13), we suggest that these may actually involve sentences in which PTT has not happened and the theme remains in situ in final position. The word order of the resulting surface string would be identical to one in which the theme moves to topic position. This hypothesis, if correct, would bring the Malagasy results more in line with the German and Dutch RI results which fail to show non-subject topicalization (and which therefore occur overwhelmingly in the underlying SOV order, as a reviewer reminded us). This proposal makes certain predictions. For example, if the theme is not a trigger in bare verb sentences then we do not expect to find *wh*-questions in this condition. Of the 35 *wh*-utterances that the children produce, only fifteen contain a verb. Two of these verbs appear in TT contexts: a root TT and a fully inflected TT form. No *wh*-questions with bare TT verbs are attested. Thus the limited child data seems to confirm the prediction. Spectrographic analysis of the utterances may allow us to determine whether the overt subjects are dislocated constituents or internal to IP. We leave this for future work.³⁷

Another factor that increases the number of overt triggers in bare verb contexts is the availability of default case. Thus, some of the overt triggers in bare verb sentences may be default (non-case marked) forms of the sort that also occur in other RI languages. Ntelitheos and Manorohanta (2004) observe that Malagasy-speaking children use the strong form of the 1st person pronoun *izaho* as trigger (not possible in the adult grammar) and that *izaho* occurs predominantly in non-finite (bare verb) contexts.³⁸ Conversely, the nominative form of the pronoun, *aho*, occurs predominately with finite verbs, as shown in Table 14.³⁹

³⁷ Although there is a prima facie case for phonological omission in addition to 'true' non-finite verbs, we have no way at this point to determine the relative proportion of each type of omission in our data. We note, however, that a phonological analysis cannot explain the bare TT verbs.

³⁸ In the adult language *izaho* marks 1st person when the NP is focused, topicalized, or coordinated, and also in some language-specific constructions such as pronoun augmentation (see Zribi-Hertz & Mbolatianavalona, 1999 for discussion).

³⁹ Of the 16 bare verbs that appear with *izaho* triggers, 4 occur in contexts requiring a TT form and 12 in contexts requiring an AT form.

This result is in line with those reported by Schütze (1997) for English and French-speaking children, who use the default pronouns (*me, moi*) in subject position of RI clauses, but not in finite clauses.⁴⁰ Examples from English, French and Malagasy are given in (26).

(26)a. Me got bean.

b. *Moi mettre ça comme Pol.*
me put that like Pol
 I (want to) put it like Pol.

c. *Lomano za (=izaho).* (Sonnia 26)
swim ISG.STR
 I (want to) swim.

Malagasy thus exhibits another property associated with RI languages, in this case, English and French, providing further support for the RI analysis of Malagasy child language, and thus for the topic hypothesis over the subject hypothesis.⁴¹

5.3 The fine structure of TP and the bare verb-null trigger relation

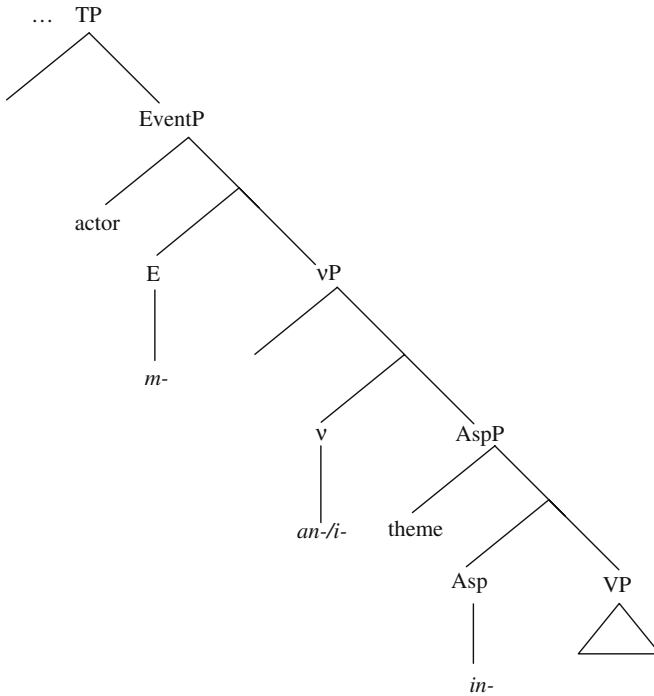
Note that the Malagasy “RI stage” differs in an important respect from the Germanic languages in that the effect of non-finiteness on the verb shows up on the trigger. That is, the trigger is most often null in this case (or as observed by Ntelitheos and Manorohanta, a default pronoun), while in the Germanic languages the effect of the RI shows up on the subject (= PRO) and topicalization is restricted to finite contexts (see Sect. 4.1). In this section we address the question of why the omission of voice morphology correlates with trigger drop, and more generally, the nature of the null trigger–bare verb relation.

We noted earlier that PTT involves the raising of a null operator (actor, theme, oblique) to Spec WhP. The trigger, base-generated in Spec TopP, is licensed under a coindexing relation with the operator and the spell-out of voice morphology on the verb is triggered by PTT. In order to facilitate the discussion of the relation between the null trigger and bare verb we present the more articulated TP structure in (27), proposed by Pearson (2001, 2005) (based on earlier work by Travis (1991, 1994, 1996)).

⁴⁰ Default pronouns are those that occur in syntactic environments that are not case-licensing positions, e.g. coordination, modification, topicalization, focalization, and double pronouns (Schütze, 2001).

⁴¹ German and Dutch children do not use non-nominative pronouns with RIs. This is because in these languages the default form of the pronoun is nominative.

(27)



The AT and TT morphemes are located in aspectual heads, EventP and AspP. The nominative argument (actor) is case-licensed in Spec EventP and the accusative argument (Theme) in Spec AspP. The nominative case feature in E is spelled out as AT voice (*m-*) when PTT targets the actor, (i.e. the operator in Spec EventP raises to Spec WhP) and the accusative case feature in Asp is spelled out as TT voice (*-in*) when PTT targets the theme—a form of *wh*-agreement, according to Pearson. Pearson (2001), following Hung (1988) and Travis (1994, 2000), analyses the AT prefix *an-/i-* as a light verb in the head of *vP* which is also spelled out when the actor (or oblique) operator moves to Spec WhP.⁴²

If the specification of voice morphology is triggered by the extraction of the actor/theme operator to Spec WhP, then the presence versus absence of the voice morphology is a diagnostic of whether *A'*-movement has occurred. Bare verbs in the child data would thus represent cases in which the operator fails to raise to Spec WhP. Recall that the trigger is licensed under a coindexing relation with the operator in Spec WhP (see (9)). If there is no movement to Spec WhP, the trigger is not licensed. We thus derive the correlation between the underspecification of voice morphology and the omission of the trigger, shown in the tables in (12) and (13). The trigger is omitted when the operator fails to undergo *A'*-movement. This has two effects—voice morphology is not realized on the verb and the trigger is not licensed. It is also possible that the null operator is dropped in a manner analogous to the omission of the *wh*-operator in early V2 languages (see (18)), with similar effects.

⁴² In Pearson (2005) this proposal is revised and *an-/i-* are generated in the head of Asp and spelled out when the theme remains in situ.

A further apparent difference between the Germanic and Malagasy child grammars concerns the locus of morphological underspecification. In the Germanic languages, tense/agreement features are underspecified and thereby block verb movement to T/AGR (and C). The resulting non-finite clauses (RIs) surface with the underlying SOV order (or SVO in Swedish and Icelandic). In Malagasy, in contrast, it is the aspectual heads (Ev and Asp) that are underspecified; T is not underspecified by our hypothesis (the present tense is not phonologically realized and the future tense is audible only in careful speech in the adult or child language) and thus verb raising to T puts the verb on the left edge of the clause, resulting in (adult-like) V (DP) (DP) order.

This difference between Malagasy and the Germanic languages with respect to the locus of underspecification may be more apparent than real, however. In the Germanic languages TP/AgrSP checks the nominative case of the subject; in Malagasy the aspectual projections EvP and AspP are the relevant case-checking categories. According to our results, the defining morphosyntactic feature of the RI stage is the underspecification of case-related functional projections.

6 Frequency effects in the acquisition of the Malagasy voices

Our first argument in support of the topic analysis of the Malagasy PTT was based on the observation that the TT voice is an early acquisition, and not delayed relative to the acquisition of AT voice. We argued that this result is unexpected on the subject analysis in which TTs are passive-like, involving a non-canonical alignment of thematic and grammatical roles. Within the universalist framework we have adopted, acquisition is driven by universal grammatical and developmental principles, such as the CAH, in interaction with language specific properties. We made predictions about Malagasy based on development in other languages because empirical research has shown substantial uniformity in development.

There is, however, an alternative approach which ties the acquisition of particular properties of grammar to their frequency in the input data with no appeal to mechanisms of a specifically grammatical sort. Various approaches to language acquisition, for example connectionist models (e.g. Rumelhart & McClelland, 1986), take statistical properties of the input to be the primary determinant of development, and some acquisition studies have shown that the relative frequency of particular pieces of morphology (e.g. Hsieh, Leonard, & Swanson, 1999) and of particular lexical items such as verbs (Naigles & Hoff-Ginsberg, 1998) correlate with their order of acquisition in the child's language. It has also been proposed that the acquisition of particular syntactic constructions, for example *wh*-questions, is affected by the relative frequency of specific *wh* + verb combinations in the input (Rowland, Pine, Lieven, & Theakston, 2003). We might therefore question a universalist approach to passives and consider instead a frequency-based account. According to such a proposal, passives are late in English and other Indo-European languages because they are infrequent in the input. In Malagasy, in contrast, passives occur much more often in the input and this promotes an earlier development. As noted by Keenan and Manorohanta (2001), in adult English passives occur at a rate of about 9% (based on written texts) while in adult Malagasy TT clauses occur at a much higher rate, as shown in Table 9.

Generally speaking, frequency-based explanations of order of acquisition are problematic. Child and adult rates may resemble each other not because children

monitor and faithfully reproduce adult frequencies but because whatever cognitive, pragmatic/discourse, or performance factors are responsible for frequency effects in the adult language are also responsible for the earlier emergence in the child's language. This seems even more likely in cases in which the child's frequency closely matches the adult frequency, such as the rate of voice types in Malagasy, because the alternative, viz. that the LAD attempts to exactly match the frequency in the input, is implausible on its face. Putting conceptual questions to the side, there is an empirical issue: frequency-based accounts (whether a strong input-matching account, i.e., children simply reproduce what they hear, or the weaker position that frequency affects order or age of acquisition) predict not only that children will quickly acquire those aspects of grammar that are frequent in the input, but also that they will not produce structures that are infrequent or not provided in the input. Neither of these predictions is generally borne out in the domain of (morpho-)syntax. For example, Salustri and Hyams (2003) show that imperatives are quite frequent in the input to German-speaking children (around 35% of verbal utterances) and yet German-speaking children produce imperatives at a rate of only 10%; instead, they use RIs with imperative force. In Italian, in contrast, imperatives make up about 13% of the verbal input to children but the imperative is produced by children at a rate of about 40%. Thus, the rate of imperatives in the input has little effect on the age of acquisition or rate. Another example concerns the difference between the V2 languages and the *pro*-drop languages with respect to the RI phenomenon. This cannot be said to be input-driven because in neither case are the kind of RIs used by children exemplified in the input. Further, even if we assume, as proposed for example by Ingram and Thompson (1996), that German-speaking children model RIs on [modal . . . infinitive] combinations in the input (e.g. *Papa will mit dem auto fahren* 'Daddy wants to drive the car'), Italian children receive the exact same modal + infinitive input (e.g. *Papa vuole guidare la macchina* 'Daddy wants to drive the car'), but do not show an RI stage. The very fact of an RI stage with its strong grammatical contingencies, as well as the cross-linguistic differences, are not accounted for by frequency-based theories of language development. There are many such examples.

Focusing on Malagasy, we see again that the predictions of the frequency model are not borne out. For example, the bare verbs that the children produce are not exemplified in the input, and neither is the relationship between bare verbs and null triggers or strong pronouns. Conversely, there are structures that are very frequent in the input, such as *wh*-questions, and these are not produced by the children in our study. For example, in child directed language the adults in our study produced 625 *wh*-expressions out of a total of 915 utterances. In contrast, the children produced only 35 *wh*-expressions out of 1,618 utterances. Thus, the frequency of *wh*-words in the input in no way determines the output frequency.

Turning specifically to the acquisition of passives, the role of the input has been examined in other languages. As noted in Sect. 3.1, it has been claimed that passives are acquired earlier in languages such as Inuktitut and Sesotho because they occur more frequently in the input (than in languages like English or German, for example). However, as we noted, it is equally possible that these constructions are not in fact true passives and that is why they are not delayed in development. In other studies where the effects of input on the acquisition of passives has been specifically tested, the results also do not support a frequency-based account. For example, Abbot-Smith and Behrens (2005) (A&B) show that in German, *sein* 'be' passives are acquired earlier than *werden* 'become' passives, the latter at age 3;8–4;3 and the former at

age 3;0–3;7, despite the fact that the two constructions are equally represented in the input.⁴³ A&B also show that the *werden* passive is acquired earlier than the morphologically related *werden* future, even though both structures are equally frequent in the input. They propose the ‘conspiracy hypothesis’, according to which acquisition of a particular construction is facilitated by the prior acquisition of morphologically related structures, but hindered by the prior acquisition of a ‘competing construction’ with an identical semantic/pragmatic function. Thus, according to A&B, the *werden* future is delayed because the child first acquires the “semantically identical” *präsens* future or the pragmatically related *wollen* + infinitive (want + infinitive). The difficulty with such an account is clear. First, it is not at all obvious what the comparison sets are that determine which constructions compete, i.e. is it the *präsens* future or the morphologically and lexically quite distant *wollen* + infinitive, or for that matter, any construction that denotes an unrealized (desired, intended, etc.) state? This, together with the fact that there is no way to predict when frequency will matter and when semantic or pragmatic relatedness will matter, makes the conspiracy theory essentially untestable.

Perhaps the biggest limitation of theories that propose that input frequency drives acquisition is that they focus almost exclusively on surface regularities in the adult and child language while offering no insight into how the child arrives at the grammatical system that underlies these regularities. With respect to the passive, we must assume that at some point children arrive at an adult-like representation of the passive, including the more abstract case and theta-assigning characteristics connected to its specific morphological and movement properties (see for example Jaeggli, 1986). A language acquisition device designed to compute and match the frequency of various elements in the input simply operates at the wrong level of analysis to explain grammatical development.

6.1 Late circumstantials

Before concluding our discussion of frequency effects, we briefly discuss the circumstantials. As we saw in Table 6, AT and TT clauses are frequent in the acquisition data. But the children produced only seven circumstantials during the entire period of investigation and most of these were in the last files. In adult language (see Table 9) the frequency of CTs is almost as high as TTs (17% vs. 21%). In child directed language,

⁴³ Abbot-Smith and Behrens claim that German presents a counterexample to the late ACDH because the child, Leo, reached 2 out of 3 production criteria with the *werden* passive by age 2;8. These criteria were: number of different verb types, type/token ratios, and active-passive alternation. With respect to the first two criteria, the simple appearance of ‘passive’ verbs (whether types or tokens) without a *by*-phrase is consistent with the adjectival analysis proposed by Borer and Wexler (1987). A&B note that Leo used the *werden* passive “with a *von*- (by) phrase several times around age 2;9 and 2;10,” but they do not provide the frequency of such sentences or any examples. They observe that in the mother’s speech only 6% of eventive passives contained agent phrases “which therefore makes it doubtful that the use of agent phrases is a particularly important criterion for passive acquisition.” However, given the plausibility of the alternative adjectival analysis, productive use of the *by*-phrase is the only convincing evidence of a true verbal passive analysis. With respect to the active-passive alternation criterion, i.e., same verb in both the active and passive form, A&B assert that this indicates that Leo became “aware of the relationship between the *sein*-passive and the active transitive which implies that he was aware of the conceptually implicit agent in the *sein* passive.” We find no justification for such a conclusion, which needs to be argued for on syntactic grounds (see for example, Okabe & Sano, 2002; Okabe, 2004).

on the other hand, CT clauses are very infrequent, around 1.4%.⁴⁴ The low frequency of the CT voice in the child data might thus be ascribed to a simple matching of the frequency in the adult input. Children use few circumstantials because adults use few circumstantials when talking to children (and children learn first those things that they hear most often). Alternatively, the delayed appearance of the CT may be due to the greater grammatical complexity of this structure. There are various respects in which the CT is more complex than the AT and TT clauses: it targets for promotion an oblique (e.g. instrumental, benefactive, locative) argument, a non-subcategorized constituent, and typically requires the suppression of a preposition; it has an additional level of functional structure, an ApplicativeP (Pearson 2001, 2005) not present in the other voices;⁴⁵ and it is morphologically more complex (see (4)). Any or all of these factors may contribute to the later emergence of the CT and our data do not allow us to decide between these different possibilities.⁴⁶

While a statistical account would explain the low frequency of the CT in the child data, it does not explain why the adults use the CT voice much less frequently with children than with other adults (17% vs. 1.4%). In other words, the statistical account completely ignores the question of why the adult input looks the way it does. To claim that the child frequencies are simply a reflex of the adult frequencies is to push the interesting question back one generation: What is it about the CT clause that makes adults avoid it when speaking to children? Most likely it is these same complexity factors that make children unlikely to produce circumstantials. An account in terms of linguistic complexity predicts both the children's infrequent use of the circumstantial and the difference in frequency between the two registers of adult language while the statistical account has nothing to say about the latter.

7 Conclusions

In this paper we have examined the early acquisition of the Malagasy voicing system and its implications for theories of the adult language. Our results support an analysis of the voicing system as involving A'-movement to a clause-peripheral trigger or topic position (Pearson, 2001, 2005) and are largely inconsistent with an A-movement analysis (Guilfoyle et al., 1992). Our analysis also supports Pearson's hypothesis that Malagasy is a V2-like language.

In addition, we have shown that there is a developmental stage in Malagasy that parallels the RI stage widely observed in various European languages, the Germanic V2 languages in particular. Apparent differences between the Germanic RIs and the analogous phenomenon in Malagasy are derived from differences in the functional structure associated with a voicing system as opposed to an agreement system.

⁴⁴ As M. Pearson points out to us, CTs most often occur in pragmatically marked structures such as oblique *wh*-questions and clefts, relative clauses, and abstract nominalizations such as 'the environment', 'government', 'agriculture', 'transportation', etc., which are less likely to occur in child directed language.

⁴⁵ Pearson (2005) proposes that the CT suffix is an applicative morpheme that introduces an oblique argument in the specifier of an ApplicativeP (AppIP).

⁴⁶ A reviewer notes that that in Pearson's system the CT voice involves externalization via A'-movement like the AT and TT voices and hence is not more complex in this respect. This is true, but as pointed out in the text, the CT voice has a number of complexities that the AT and TT voices do not share.

Although Malagasy is typologically distinct from the child languages that have been most extensively studied, we have shown that in its development it shares many important properties with these other languages, providing further support for the assumptions of a universalist model of language development, including continuity, UPI, and EMC.

References

- Allen, S., & Crago, M. (1996). Early passive acquisition in Inuktitut. *Journal of Child Language*, *23*, 129–155.
- Abbot-Smith, K., & Behrens, H. (2005). How known constructions influence the acquisition of other constructions: The German passive and future constructions. ms., Max Planck Institute for Evolutionary Anthropology and University of Groningen.
- Babyonyshev, M., Ganger, J., Pesetsky, D., & Wexler, K. (2001). The maturation of grammatical principles: Evidence from Russian unaccusatives. *Linguistic Inquiry*, *32*, 1–44.
- Baker, M. (1988). Theta theory and the syntax of applicatives in chichewa. *Natural Language and Linguistic Theory*, *6*, 353–389.
- Barrett-Keach, C. (1986). Word internal evidence from Swahili for AUX/INFL. *Linguistic Inquiry*, *17*, 559–564.
- Becker, M. (2005). Raising, control and the subset principle. In J. Alderete, C. Han, & A. Kochetov (Eds.), *Proceedings of the 24th West Coast conference on formal linguistics*, (pp. 52–60) Somerville, MA: Cascadilla Press.
- Becker, M. (To appear). There began to be a learnability problem. *Linguistic Inquiry*.
- Becker, M. & Hyams, N. (2000). Modal reference in children's root infinitives. In E. Clark (Ed.), *Proceedings of the thirtieth annual child language research forum*, (pp. 113–122) Stanford: CSLI.
- Berger-Morales, J., Salustri, M., & Gilkerson, J. (To appear). Root infinitives in the spontaneous speech of two bilingual children: Evidence for separate grammatical systems. In J. Cohen et al. (Eds.), *ISB4: Proceedings of the 4th international symposium of Bilingualism* (pp. 296–305). Somerville, MA: Cascadilla Press.
- Bever, T. G. (1970). The cognitive basis for linguistic structures: In D. Hayes (Ed.), *Cognition and the development of language*. (pp. 279–362). New York: John Wiley & Sons
- Blom, E. (2003). *From root infinitive to finite sentence*. unpublished Ph.D. dissertation, University of Amsterdam/LOT.
- Borer, H., & Wexler, K. (1987). The maturation of syntax. In T. Roeper & E. Williams (Eds.), *Parameter setting* (pp. 123–172). Dordrecht: D. Reidel Publishing.
- Boser, K. (1997). The acquisition of word order knowledge in early child German: Interactions between syntax and pragmatics. unpublished Ph.D. dissertation, Cornell University, Ithaca.
- Bryan, A. (1995). *Der Erwerb des Passivs: Sprach- und Lernbarkeitstheoretische Betrachtungen zum Englischen und Deutsche*. unpublished Ph.D. dissertation, Neuphilologische Fakultät, Universität Tübingen.
- Buell, L. (2002). Swahili Amba-less Relatives without Head Movement. In H. Torrence (Ed.), *UCLA working papers in linguistics* (Vol. 8, pp. 86–106).
- Builles, J.-M. (1988). La Voix Agento-Stativ en Malgache. In *Etudes d'Océan Indien* (Vol. 9). Paris, INALCO.
- Chien, Y. C., & Wexler, K. (1990). Children's knowledge of locality principles in binding as evidence for the modularity of syntax and pragmatics. *Language Acquisition* *1*, 225–295.
- Chomsky, N. (1995). *The minimalist program*. Cambridge, MA: MIT Press.
- Chomsky, N. (1999). Derivation by phase. *MIT occasional papers in linguistics* (Vol. 18). Cambridge, MA: MITWPL.
- Chung, S. (1998). *The designs of agreement: Evidence from Chamorro*. Chicago: University of Chicago Press.
- Clahsen, H., & Penke, M. (1992). The acquisition of agreement morphology and its syntactic consequences: New Evidence on German child language from the Simone Corpus. In J. M. Meisel (Ed.), *The acquisition of verb placement, functional categories and V2 phenomena in language acquisition* (pp. 181–223). Dordrecht: Kluwer Academic.
- Crain, S. (1991). Language acquisition in the absence of experience. *Behavioral and Brain Sciences*, *14*, 597–650.

- Crain, S., & Pietroski, P. (2001). Nature, nurture and universal grammar. *Linguistics and Philosophy*, 24, 139–186.
- Crawford, J. (2004). An adversity analysis of Sesotho child passives: Reanalyzing a counterexample to maturation. poster presentation at GALANA I, University of Hawaii, Honolulu/Manoa.
- de Haan, G. J., & Tuijnman, K. (1988). Missing subjects and objects in child grammar. In P. Jordens, & J. Lalleman (Eds.), *Language development* (pp. 101–122). Dordrecht: Foris.
- Deen, K. U. (2005). *The acquisition of Swahili*. Amsterdam: J. Benjamins.
- Demuth, K. (1989). Maturation and the acquisition of the Sesotho passive. *Language*, 65, 56–80.
- Djurkovic, M. (2005). Structural vs. frequency effects in L1 acquisition of the passive and impersonal in Serbian. Paper presented at the 27th conference on Germanic linguistics, Workshop on frequency effects in language acquisition.
- Felix, S. (1980). Cognition and language development: A German child's acquisition of question words. In D. Nehls (Ed.), *Studies in language acquisition* (pp. 91–109). Heidelberg: Gross.
- Fox, D., & Grodzinsky, Y. (1998). Children's passive: a view from the *by*-Phrase. *Linguistic Inquiry*, 29(2), 311–332.
- Fukui, N., & Speas, M. (1986). Specifiers and projection. In N. Fukui et al. (Eds.), *MIT working papers in linguistics* (Vol. 8, pp. 128–172). Cambridge, MA: MITWPL.
- Gerken, L. A. (1994). A metrical template account of children's weak syllable omissions from multisyllabic words. *Journal of Child Language*, 21, 565–584.
- Grodzinsky, Y., & Reinhart, T. (1993). The innateness of binding and coreference. *Linguistic Inquiry*, 24, 69–101.
- Guasti, M. T. (1993/1994). Verb syntax in Italian child grammar: Finite and non-finite verbs. *Language Acquisition*, 3(1), 1–40.
- Guasti, M. T. (1999). An excursion into interrogatives in early English and Italian. In M.-A. Friedemann & L. Rizzi (Eds.), *The acquisition of syntax: Studies in comparative developmental linguistics* (pp. 105–128). Harlow: Longman.
- Guilfoyle, E., Hung, J., & Travis, L. (1992). Spec of IP and Spec of VP: Two subjects in Austronesian languages. *Natural Language and Linguistic Theory*, 10, 375–414.
- Haegeman, L. (1995). Root infinitives, tense, and truncated structures in Dutch. *Language Acquisition*, 4, 205–255.
- Hamann, C., & Plunkett, B. (1998). Subjectless sentences in Danish. *Cognition*, 69, 35–72.
- Harris, T., & Wexler, K. (1996). The optional-infinitive stage in child English. In H. Clahsen (Ed.), *Generative perspectives on language acquisition* (pp. 1–42). Amsterdam: John Benjamins Publishing Company.
- Hickey, T. (1987). The early acquisition of Irish: Grammatical patterns and the role of formula. unpublished Ph.D. dissertation, University of Reading.
- Hirsch, C., & Wexler, K. (To appear). Who seems to rescue raising. In *Proceeding of generative approaches to language acquisition-North American (GALANA)*. Somerville: Cascadilla Press.
- Hoekstra, T., & Hyams, N. (1997). Agreement and the finiteness of V2. Evidence from child language. In A. Greenhill et al. (Eds.), *Proceedings of BUCLD 21* (pp. 360–373).
- Hoekstra, T., & Hyams, N. (1998). Aspects of root infinitives. *Lingua*, 106, 81–112.
- Hopper, P. J., & Thompson, S. A. (1980). 'Transitivity in grammar and discourse. *Language*, 56, 251–299.
- Horgan, D. (1978). The development of the full passive. *Journal of Child Language*, 5, 65–80.
- Hsieh, L., Leonard, B., & Swanson, L. (1999). Some differences between English plural noun inflections and third person singular verb inflections in the input: The contributions of frequency, sentence position and duration. *Journal of Child Language*, 26, 31–545.
- Huang, C.-T. J. (1984). On the distribution and reference of empty pronouns. *Linguistic Inquiry*, 15, 531–574.
- Hung, H. (1988). The structure of derived nouns and verbs in Malagasy: A syntactic account, ms., McGill University.
- Hyams, N. (1983). The acquisition of parameterized grammars. Ph.D. dissertation, Graduate Center/City University of New York.
- Hyams, N. (1986). *Language acquisition and the theory of parameters*. Dordrecht: D. Reidel.
- Hyams, N. (1992). The genesis of clausal structure: In J. M. Meisel (Ed.), *The acquisition of verb placement: Functional categories and V2 phenomena in language acquisition* (pp. 371–400). Dordrecht: Kluwer.
- Hyams, N. (2002). Clausal structure in child Greek. *The Linguistic Review*, 19, 225–269.
- Hyams, N. (2005). Aspectual effects on interpretation in early grammar. ms., UCLA.

- Ingram, D., & Thompson, W. (1996). Early syntactic acquisition in German: Evidence for the modal hypothesis. *Language*, 72, 97–120.
- Jaeggli, O. (1986). Passive. *Linguistic Inquiry*, 17, 587–622.
- Johns, A. (1992). Deriving ergativity. *Linguistic Inquiry*, 21, 57–87.
- Josefsson, G. (2002). The use and function of non-finite root clauses in Swedish child language. *Language Acquisition*, 10, 273–320.
- Keenan, E. L. (1976). Remarkable subjects in Malagasy. In C. Li (Ed.), *Subject and topic*, (pp. 249–301). New York: Academic Press
- Keenan, Edward L. (1995). Predicate-Argument Structures in Malagasy', In C. Burgess et al. (Eds.), *Grammatical Relations*. (pp. 171–217) CSLI, Stanford.
- Keenan, E. L., & Manorohanta, C. (2001). A quantitative study of voice in Malagasy. *Oceanic Linguistics*, 40, 67–85.
- Keenan, E. L., & Manorohanta, C. (2004). Malagasy clause structure and language acquisition. Paper presented at AFLA XI, Berlin, April (2004)
- Keenan, E. L., & Polinsky, M. (1998). Malagasy (Austronesian). In A. Spencer, & A. Zwicky (Eds.), *The handbook of morphology*, (pp. 563–623). New York: Oxford University Press.
- Klein, S. (1982). Syntactic theory and the developing grammar: Reestablishing the relationship between linguistic theory and data from language acquisition. Ph.D. dissertation, UCLA.
- Kitagawa, Y. (1986). Subjects in Japanese and English. Ph.D. dissertation, University of Massachusetts at Amherst.
- Koopman, H., & Sportiche, D. (1991). The position of subjects. *Lingua*, 85, 211–258.
- Krämer, I. (1993). The licensing of subjects in early child language. In *MITWPL*, (Vol. 19, pp. 197–212). Cambridge, MA: MITWPL.
- Kratzer, A. (2000). Building states. In L. Conathan et al. (Eds.), *Proceedings of the Berkeley linguistics society* (Vol. 26, pp. 385–399).
- Kuczaj, A. S. (1979). Evidence for a language learning strategy: On the relative ease of acquisition of prefixes and suffixes. *Child Development*, 50, 1–13.
- Kuroda, S.-Y. (1988). Whether we agree or not. *Linguistic Investigations*, 12, 1–47.
- Londe, Z. C. (2004). The Hungarian case of root infinitives: Too many cases no place for root infinitives, ms, UCLA.
- Maratsos, M., Kuczaj, S., Fox, D., Chalkley, M. A. (1985). Semantic restrictions on children's early passives. *Cognition*, 19, 167–191.
- Meints, K. (1999). Prototypes and the acquisition of passives. In B. Kokinov (Ed.), *Perspectives on cognitive science* (Vol. 4, pp. 67–77). Sofia: NBU Press
- Meisel, J. M., & Müller, N. (1992). Finiteness and verb placement in early child grammars: Evidence from simultaneous acquisition of French and German in Bilinguals. In J. Meisel (Ed.), *The acquisition of verb placement: functional categories and V2 phenomena in language acquisition*, (pp. 109–138). Dordrecht: Kluwer.
- Mills, A. E. (1985). The acquisition of German. In D. I. Slobin (Ed.), *The crosslinguistic study of language acquisition: Volume 1: The data* (pp. 141–254). Hillsdale, New Jersey: Lawrence Erlbaum.
- Mithun, M. (1989). The acquisition of polysynthesis. *Journal of Child Language*, 16, 285–312.
- Murasugi, K. (2000). Bunpoo Kakutoku: Idou Gensyoo-o Tyuusin Tosite (The Acquisition of Grammar with Special Reference to Movement). *Literature and Languages*, 68, 223–259.
- Naigles, L. R., & Hoff-Ginsberg, E. (1998). Why are some verbs learned before other verbs? Effects of input frequency and structure on children's early verb use', *Journal of Child Language*, 25, 95–120.
- Ntelitheos, D., & Manorohanta, C. (2004). Default pronouns and root infinitives in Malagasy acquisition. In K. U. Deen et al. (Eds.), *The proceedings of the inaugural conference on generative approaches to language acquisition—North America, Honolulu, HI* (pp. 249–260). University of Connecticut Occasional Papers in Linguistics 4.
- Okabe, R. (2004). Was the Pig dropped? the acquisition of implicit arguments in Japanese, unpublished Master's thesis, UCLA.
- Okabe, R., & Sano, T. (2002). The acquisition of implicit arguments in Japanese and related matters. In B. Skarabela, S. Fish, & A. H.-J. Do (Eds.), *Proceedings of the Boston University conference on language development* (Vol. 26, pp. 485–499). Somerville, MA: Cascadilla Press.
- Ouhalla, J. (1994). The construct state in Berber. In *Studies in Afroasiatic Grammar*. (pp. 278–301). Sofia Antipolis.
- Pearson, M. (2001). *The clause structure of Malagasy: A minimalist approach*, UCLA dissertations in Linguistics 21, Department of Linguistics, UCLA.

- Pearson, M. (2005). The Malagasy subject/topic as an A'-element. *Natural Language & Linguistic Theory*, 23, 381–457.
- Pierce, A. E. (1992). *Language acquisition and syntactic theory: A comparative analysis of French and English child grammars*. Dordrecht: Kluwer.
- Pinker, S. (1984). *Language learnability and language development*. Cambridge, MA: Harvard University Press.
- Platzack, C. (1992). Functional categories in early Swedish. In J. Meisel (Ed.), *The acquisition of functional categories and V2 phenomena in language acquisition* (pp. 66–82). Dordrecht: Kluwer.
- Platzack, C. (1996). The initial hypothesis of syntax, a minimalist perspective on language acquisition. In H. Clahsen (Ed.), *Generative perspectives on language acquisition* (pp. 369–414). Amsterdam: John Benjamins Publishing Company.
- Plunkett, K., & Strömquist, S. (1990). The acquisition of Scandinavian languages. In J. Allwood (Ed.), *Gothenburg papers in theoretical linguistics*. Gothenburg.
- Poeppl, D., & Wexler, K. (1993). The full competence hypothesis of clause structure in early German. *Language*, 69, 1–33.
- Pye, C. (1992). The acquisition of Kiche Maya. In D. I. Slobin (Ed.), *The crosslinguistic study of language acquisition* (Vol. 3, pp. 221–308). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Pye, C. (2001). The acquisition of finiteness in K'iche' Maya. In A. H.-J. Do, L. Domínguez, & A. Johansen (Eds.), *Proceedings of the 25th annual Boston University conference on language development* (pp. 645–656). Somerville, MA: Cascadilla Press.
- Pye, C., & Quixtan Poz, P. (1988). Precocious passives and antipassives in Quiche Mayan. In E. Clark, & Y. Matsumoto (Eds.), *Papers and reports on child language development* (Vol. 27, pp. 71–80). Stanford University.
- Rajaona, S. (1972). *Structure du Malgache. Etudes des Formes Prédicatives*. Fianarantsoa: Librairie Ambozontany.
- Rajemisa-Raolison, R. (1971). *Grammaire Malgache* (7ème Édition). Ambozontany, Fianarantsoa: Centre de Formation Pédagogique.
- Rasetti, L. (1999). Null subjects and root infinitives in the child grammar of French: In M.-A. Friedmann & L. Rizzi (Eds.), *The acquisition of syntax: Studies in comparative developmental linguistics* (pp. 237–268). Harlow: Longman
- Rhee, J., & Wexler, K. (1995). Optional infinitives in Hebrew. In *MIT working Papers in Linguistics* (vol. 26, pp. 383–402).
- Richards, N. (2000). Another look at Tagalog subjects. In I. Paul et al. (Eds.), *Formal issues in Austronesian linguistics* (pp. 105–116). Dordrecht: Kluwer Academic Press.
- Rizzi, L. (1994). Some notes on linguistic theory and language development: The case of root infinitives. *Language Acquisition* 3, 371–393.
- Rizzi, L. (1997). The fine structure of the left periphery. In L. Haegeman (Ed.), *Elements of grammar*, (pp. 281–337). Dordrecht: Kluwer.
- Rizzi, L. (1999). Remarks on early null subjects. In M.-A. Friedemann & L. Rizzi (Eds.), *The acquisition of syntax: Studies in comparative developmental linguistics* (pp. 269–292). Harlow: Longman.
- Roeper, T., & Rohrbacher, B. (2000). Null subjects in early child English and the theory of economy of projection. In S. M. Powers., & C. Hamann (Eds.), *The acquisition of scrambling and cliticization*, (pp. 345–396). Dordrecht: Kluwer Academic Publishers.
- Rowland, C., Pine, J., Lieven, E., & Theakston, A. (2003). Determinants of the order of acquisition of Wh-questions: Reevaluating the role of caregiver speech. *Journal of Child Language*, 30, 609–635.
- Rumelhart, D. & McClelland, J. (1986). On learning the past tense of English verbs. In D. E. Rumelhart, J.L. McClelland (Eds.), *Parallel distributed processing* (Vol. 2). Cambridge, MA: MIT Press.
- Rus, D., & Chandra, P. (2005). Bare participles are not root infinitives: Evidence from early child Slovenian. In A. Brugos, M. R. Clark-Cotton & S. Ha (Eds.), *BUCLD 29* (pp. 493–503). Somerville, MA: Cascadilla Press.
- Salustri, M. (1998). *Acquisizione Simultanea di Italiano e Tedesco. Studio Longitudinale in Alcuni Bambini di età Prescolare*. unpublished Ph.D. dissertation, Università degli Studi di Siena.
- Salustri, M., & Hyams, N. (2003). Is there a RI analogue in the null subjects languages?, B. Beachley, A. Brown & F. Conlin (Eds.), *Proceedings of BUCLD 27*, (Vol. 27, pp. 692–703). Somerville, MA: Cascadilla Press.

- Sano, T., & Hyams, N. (1994). Agreement, finiteness, and the development of null arguments. In M. González (Ed.), *NELS 24: Proceedings of the North east Linguistic Society* (pp. 543–558). Amherst: GLSA.
- Santelmann, L. (1995). *The acquisition of verb second grammar in child Swedish*. Unpublished Ph.D. thesis, Cornell University.
- Schachter, P. (1987). Tagalog. In B. Comrie (Ed.), *The world's major languages*, (pp. 935–958). Oxford University Press.
- Schütze, C. T. (1997). *INFL in child and adult language: Agreement, case, and licensing*. Unpublished Ph.D. dissertation, MIT.
- Schütze, C. T. (2001). On the nature of default case. *Syntax*, 4, 205–238.
- Sigurjónsdóttir, S. (1999). Root infinitives and null subjects in early Icelandic. In A. Greenhill et al. (Eds.), *Proceedings of BUCLD 23* (pp. 630–641). Somerville, MA: Cascadilla Press.
- Snyder, W., Hyams, N., & Crisma, P. (1995). Romance auxiliary selection with reflexive clitics: Evidence for early knowledge of unaccusativity. In E. Clark (Ed.), *Proceedings of the 26th annual child language research forum* (pp. 127–136). Stanford, CA: CSLI Publications.
- Sugisaki, K. (1997). Japanese passives in acquisition. Paper presented at the 12th Annual Meeting of the Sophia Linguistic Society, Sophia University.
- Travis, L. (1991). Derived objects, inner aspect, and the structure of VP. Paper presented at the 22nd Annual Meeting of the North East Linguistics Society (NELS 22).
- Travis, L. (1994). Event phrase and a theory of functional categories. In P. Koskinen (Ed.), *Proceedings of the 1994 annual conference of the Canadian Linguistics Association, Toronto Working Papers in Linguistics* (pp. 559–570). Toronto.
- Travis, L. (1996). The syntax of achievements. ms., McGill University.
- Travis, L. (2000). The I-syntax/S-syntax boundary: Evidence from Austronesian. In I. Paul et al. (Eds.), *Formal issues in Austronesian linguistics* (pp. 167–194). Dordrecht: Kluwer Academic Publishers.
- Thrift, E. (2003). Object drop in the L1 acquisition of Dutch. unpublished Ph.D. dissertation, University of Amsterdam/LOT.
- Valian, V. (1991). Syntactic subjects in the early speech of American and Italian Children. *Cognition*, 40, 21–81.
- Varlokosta, S., Vainikka, A., & Rohrbacher, B. (1998) Functional projections, markedness and root infinitives in early child Greek. *The Linguistic Review*, 15, 187–207.
- de Villiers, J., & de Villiers, P. (1985). The acquisition of English. *The Crosslinguistic Study of Language Acquisition*, 1, 27–141.
- Verrrips, M. (1996). *Potatoes must peel: The acquisition of the Dutch passive*. The Hague: Holland Academic Graphics.
- Verrrips, M., & Weissenborn, J. (1992). Routes to verb placement in early German and French: The independence of finiteness and agreement. In J. Meisel (Ed.), *The acquisition of verb placement. Functional categories and V2 phenomena in language acquisition* (pp. 283–331). Dordrecht: Kluwer.
- Wang, Q., Martin, D.L., Best, C., & Levitt, A. (1992). Null subject versus null subject: Some evidence from the acquisition of Chinese and English. *Language Acquisition*, 2, 221–254.
- Wexler, K. (1994). Optional infinitives, head movement, and the economy of derivations in child grammar. In D. Lightfoot & N. Hornstein (Eds.), *Verb Movement* (pp. 305–350). Cambridge: Cambridge University Press
- Wexler, K. (2004). Beauty and awe: Language acquisition as high science. Plenary address at the Boston University Conference on Language Development 29.
- White, L. (1982). *Grammatical theory and language acquisition*. Dordrecht: Foris.
- Wijnen, F. (1997). The temporal interpretation of root infinitivals: The effect of eventivity. In J. Schaeffer (Ed.), *The interpretation of root infinitives and bare nouns in child language. MIT Working Papers in Linguistics* (Vol. 1x, pp. 1–25). Cambridge, MA: MITWPL
- Williams, E. (2003). *Representation theory*, Cambridge, MA: MIT Press.
- Zribi-Hertz, A., & Mbolatianavalona, L. (1999). Towards a modular theory of linguistic deficiency: Evidence from Malagasy personal pronouns. *Natural Language and Linguistic Theory*, 17, 161–218.