

# Root Infinitives in Japanese and the Late Acquisition of Head-Movement\*

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## 1. Introduction

Root Infinitives (RIs) are the non-finite verbal forms which children at around two years old use in matrix clauses, where they are not possible in their adult grammar. There have been several approaches to explain why children acquiring languages like English (Wexler 1994), Dutch (Haegeman 1995, Blom and Wijnen 2000), French (Krämer 1993, Rasetti 2003), and Russian (Bar-Shalom and Snyder 1998, Brun, Avrutin, and Babyonyshev 1999), among others, often use non-finite forms as in (1) through (3).<sup>1</sup>

- (1) a. Eve sit floor (1;7) (English) (Brown 1973)  
b. That truck fall down (2;0) (Sano and Hyams 1994)
- (2) Peter bal pakken (2;1) (Dutch)  
Peter ball get-INF ‘Peter (wants to) get the ball.’ (Blom and Wijnen 2000)
- (3) Dormir petit bébé (1;11) (French)  
sleep-INF little baby ‘A little baby sleeps.’ (Guasti 2004)

It is well known that there are some salient morpho-syntactic and semantic properties of RIs, as listed in (4).

- (4) a. RIs are optional: RIs occur side by side with fully inflected verbs.  
b. RIs are tenseless verbs in root contexts.  
c. RIs occur predominantly with null subjects.  
d. RIs generally do not occur in *wh*-questions.  
e. RIs occur in modal contexts (Modal Reference Effects (MRE)).  
f. RIs are restricted to event-denoting predicates (Eventivity Constraint).  
g. RIs are very rare in pro-drop languages. (Adopted from Deen 2002, Hyams 2005, Salustri and Hyams 2003)

As (4a) states, during the RI stage, children optionally produce matrix non-finite verbs in place of finite verbs, while adults only allow non-finite verbs in embedded sentences. Observe the German examples given in (5).

- (5) a. Thorstn das haben [-finite] (2;1)  
T that have-INF ‘Thorstn have that.’  
b. Mein Hubsaube had [+finite] Tiere din (2;1)  
my helicopter has animals in it ‘My helicopter has animals in it.’ (Wexler 1994)

As for (4c), the RI stage is considered to be some kind of disturbance of TP, which is home of both tense and EPP. As shown in (6), the subject of RIs tends to be null even in some of the non-pro-drop languages.

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<sup>1</sup> Abbreviations used in the glosses are as follows: Acc=Accusative Case, Asp=aspect morpheme, Dat=dative Case, INF=infinitive, Mood=mood marker, Neg=negation, Nom=Nominative Case, Pres=present, Past=past.

- (6) a. Hubsauber putzn (2;1) (Dutch)  
 helicopter clean-INF Context: The child is cleaning his toy helicopter with a toothbrush.  
 b. roeren (2;4)  
 stir-INF Context: The child's mother is cooking oatmeal. (Krämer 1993)

As (4d) states, it is also widely reported that RI verbs occur in declarative sentences, but not in *wh*-questions.

- (7) a. en wat doen ze daar? (Dutch) (2;6)  
 and what do they there? 'And what do they do there?'  
 b. wie staat daar? (2;6)  
 who stands there? 'Who stands there?' (Haegeman 1995)

The Modal Reference Effects are also observed. RIs typically have a modal or irrealis meaning, expressing volition or request (Hoekstra and Hyams 1998, among others). Observe the example in (8) from Dutch.

- (8) vrachtwagen emmer doen (2;4) (Dutch)  
 truck bucket do-INF  
 Context: Matthijs (speaker) wants the investigator to put the truck in the bucket. (Blom and Wijnen 2000)

It has been also observed that RIs are largely restricted to eventive predicates, while finite verbs can either be eventive or stative. This is termed Eventivity Constraint (Hoekstra and Hyams 1998). These early verbs tend to receive a modal meaning with overwhelming frequency.

As (4g) states, a few researchers have observed that RIs are not found in the early grammar of such pro-drop languages as Italian, Spanish, Catalan, and languages where finiteness is expressed exclusively by number (e.g., Guasti 1994). However, some researchers have proposed that there is a RI analogue stage in those pro-drop languages. For instance, Varlokosta, Vainikka and Rohrbacher (1996) and Hyams (2005) argue that the bare perfective is a RI analogue in Greek; Kim and Phillips (1998) suggest that the RI analogue is the V with mood marker *-e* for Korean; Salustri and Hyams (2003, 2006) suggest that the RI analogue in Italian is the imperative, and a parallel proposal is made for Kuwaiti (Aljenaie 2000), American and Brazilian Sign Languages (Lillo-Martin and Quadros 2008), and Chinese (Chien 2008).

Phillips (1995) argues that RIs are not due to a deficit in syntactic structure, but they appear in fully represented finite clauses. The verb and the inflectional features are present, but since they are not syntactically joined, when morphological items are inserted to realize the syntactic items, a default verbal form is used to spell-out the verb.

Our own limited exploration of this kind of phenomena in Japanese suggests that there is a RI analogue stage in some of the East Asian languages. Murasugi, Fuji and Hashimoto (2007) and Murasugi and Fuji (2008) propose, mainly based on the analysis of natural production data of a Japanese-speaking child, Sumihare (Noji Corpus 1973-1977), that there is a RI analogue stage in Japanese acquisition, and that the very early non-finite verb is a *not* the bare form or root infinitive, but it is a full form in Japanese. The RI analogue for Sumihare is the past-tensed verbal form associated with *-ta*, which is initially (1;6-1;7) used 100% of time, and it shares the central morpho-syntactic and semantic properties of RIs summarized in (4). In this paper, we begin by investigating the nature of the very early stage of Japanese-speaking children, and argue that the RI analogue stage or the Very Early Non-Finite Verb Stage is due to the syntactic deficits and that the absence of merger of a verb with inflection.

## 2. Previous Studies

### 2.1. Phillips (1995, 1996)

Based on a comparative study of the syntactic developments of two-year-old children of V-raising languages such as Dutch, Flemish and French and a non-V-raising language, English, Phillips (1995, 1996) argues that two-year-old children's root infinitive clause contains all of the components of adults' finite clause, and what is missing is the derivational step that would combine the verb with inflection. The cause of the delay is, according to Phillips' analysis, difficulty with the process of accessing morphological knowledge, which is not an overlearned and automatic process for the child. Children's syntactic structures contain all of the appropriate inflectional features, but they are not syntactically joined when lexical items are inserted to spell-out syntactic features.

Phillips (1995) examines the relation between RIs and *wh*-questions in English to investigate whether or not the head movement is a key to RIs, since subject *wh*-questions in English do not involve verb movement while those in Dutch do. The absence of RIs in *wh*-questions is widely found, which is termed Crisma's effect. According to Haegeman (1995), for example, *wh*-questions are rare, but the main verbs used in *wh*-questions are finite, as shown in Table 1.

**Table 1: Finiteness in Declaratives and Questions in Dutch (Haegeman 1995, modified in Phillips 1995)**

Hein 2;4-3;1	+finite	-finite
All clauses	3768	721
<i>Wh</i> -questions	88	2

Total=4579,  $\chi^2 = 12.71$ ,  $p < 0.001$

Phillips (1995) shows, however, that Crisma's effect is not observed in subject *wh*-questions in English. The percentage of inflected verbs in declaratives and *wh*-questions are almost the same, as summarized in Table 2.

**Table 2: Finiteness in Declaratives and Questions in English (Phillips 1995)**

Adam 2;3-3;1	inflected V	uninflected V	%inflected
Declaratives	134	203	40%
<i>Wh</i> -questions	69	92	43%

Total=498,  $\chi^2 = 0.43$ ,  $p = 0.51$

The lack of Crisma's effect in English is analyzed to be due to the absence of head movement in English subject *wh*-questions. While *wh*-questions in V2 languages, including Dutch, involve V-I(T)-C movement, English subject *wh*-questions do not involve any movement of main verbs. Hence, Phillips (1995) proposes that what is missing is the derivational step which would normally combine the verb with inflection.

In order to test this hypothesis against the null subject facts, Phillips investigates the interaction between finiteness and null subjects in Dutch and English. Krämer (1993) points out that vast majority of infinitive verbs occur in subjectless sentences (Krämer's effect). This effect, however, is not observed in English.

**Table 3: Finiteness and Subjects in Dutch (Krämer 1993, modified in Phillips 1995)**

Thomas 2;3-2;8	+finite	-finite
overt subject	431	21
null subject	165	246

Total=863,  $\chi^2 = 307.07$ ,  $p < 0.0001$

**Table 4: Finiteness and Subjects in English (Phillips 1995)**

Adam 2;3-3;0	+finite	-finite
overt subject	79	195
null subject	34	47

Total=355,  $\chi^2 = 4.98$ ,  $p = 0.026$

An English-speaking child, Adam, used null subjects both with finite and infinitive verbs, and Phillips points out that there was even a tendency to use overt subjects more with infinitive verbs. Given that Nominative Case licensing has nothing to do with head movement in English, Phillips concludes that RI clauses are "adult clauses minus one step of head movement" and that the cause of delay in merging a verb with inflection is in the difficulty with the process of accessing morphological knowledge. As for adults, accessing inflection paradigms is an automatic process after having been overlearned, and bears minimal or zero cost. As for young children, however, the process is not yet automatic, and as a result, the cost of accessing a given form may outweigh the cost of failing to realize it.

It is well known that head movement itself is, in fact, acquired very early. For example, as we showed in (5), which is repeated below, German-speaking children even at age two know that an infinite verb stays at the end of the clause, whereas a verb, if it is finite, moves to C, which is the second position.

- (5) a. Thorstn das haben [-finite] (2;1)  
 T that have-INF 'Thorstn have that.'  
 b. Mein Hubsaupe had [+finite] Tiere din (2;1)  
 my helicopter has animals in it 'My helicopter has animals in it.' (Wexler 1994)

The fact that children use finite verbs in the second position as in (5b) indicates that V-C movement is already acquired in the stage in question. The parallel argument is found in French. In adult French, finite verbs are raised from V to I, past the negation *pas*, while infinitives remain below the negation in the VP. (See Déprez and Pierce 1993). French-speaking children, even before age two, produce the adult-like word order of V-Neg as in (9b).

- (9) a. Pas manger la purpée (1;9)                      b. Elle roupe pas (1;11)  
 not eat-INF the doll 'The doll never eats.'                      it rolls not 'It never rolls.'

In addition, as we briefly argued on the basis of (4), given the fact that the semantic/syntactic commonalities, such as MRE and Eventivity Constraints, are observed across languages at the stage in question, Phillips' proposal that the RIs are not syntactic deficit but reflect children's difficulty with the process of accessing morphological knowledge, could be too

strong. However, we argue in this paper that Phillip’s insight can still be maintained: There is a delay of merger of a verb with inflection in Japanese, an agglutinating language, and at the RI analogue stage, the inflectional features (including T (I)) are not successfully merged with the verb.

## 2.2. Previous Studies on Japanese Root Infinitives

Before we go into the discussion of children’s very early syntactic structures, this section reviews representative accounts of “root infinitives” in Japanese.

The collective force of the acquisition data from the null-subject languages is to put a nail in the coffin of any hope that the RI analogue stage could be found in Japanese. Sano (1995, 1999) makes a detailed longitudinal study with three Japanese-speaking children, Toshi (2;3-2;8), Ken (2;8-2;10) and Masanori (2;4), to see if non-finite forms would be produced in a main clause. The verb forms he examines are exemplified in (10): *Renyookei -i* (preverbal) in (10a), *Mizenkei -a* (irrealis) in (10b), and Conjunctive *-te* (participial) in (10c).

- (10) a. Taro-ga kore ni hair -i ta -i (koto)  
 -Nom this to enter-(Adverbial) want-Pres (fact)  
 ‘Taro wants to enter into this.’  
 b. Taro-ga kore ni hair -a na -i (koto)  
 -Nom this to enter-(Irrealis) Neg-Pres (fact)  
 ‘Taro does not enter into this.’  
 c. Taro-ga kore ni hair -te, Jiro-ga are ni hair -u  
 -Nom this to enter-(Conjunctive) -Nom that to enter-Pres  
 ‘(While) Taro enters into this, Jiro enters into that.’

As shown in Table 5, the Preverbal *-i*, the Irrealis *-a* and the Conjunctive *-te* were not produced as a main verb by those subjects, while these forms were produced in the non-root context, i.e., under finite auxiliary predicates.

**Table 5: Inflection of Main Verbs in Affirmative Declarative Root Clause (Sano 1999)**

	Non-past <i>-(ru)</i>	Past <i>-ta</i>	Preverbal	Irrealis	Conjunctive
Toshi (2;3-2;8)	288	84	0	0	1 (0.2%)
Ken (2;8-2;10)	111	175	0	1 (0.3%)	0
Masanori (2;4)	138	50	0	0	0

Based on the data analysis, Sano (1995, 1999) concludes that children at two, who would be in the RI stage in other languages, did not produce non-finite verbal forms, and hence, there is no RI stage found in child Japanese.

Kato, Sato, Takeda, Miyoshi, Sakai and Koizumi (2003) support Sano’s conclusion. Pointing out that bare verb stems without tense morphemes are not allowed in Japanese, they predict that either the present- or the past-tensed form should be a RI analogue. They analyze the corpus data of two Japanese-speaking children, Ryo (2;0-3;0) and Tai (2;0-2;9), and see if either of those form is overused. Their results are given in Table 6 and Table 7.

**Table 6: Number of Past- or Present-tensed Verbal Form in Ryo’s Corpus (Kato et al. 2003)**

	Past-tensed verb forms	Present-tensed verb forms
Correct Form	476	761
Erroneous form	7	4
Unclear	2	5
Total	485	770

**Table 7: Number of Past- or Present-tensed Verbal Form in Tai’s Corpus (Kato et al. 2003)**

	Past-tensed verb forms	Present-tensed verb forms
Correct form	787	1667
Erroneous form	3	15
Unclear	0	14
Total	790	1696

As shown above, few erroneous verbal forms are found. Both of the two-year-old children produced present- and past-tensed forms in the appropriate contexts. Hence, Kato et al. (2003) conclude that a RI stage is not found in child Japanese.

## 3. The Root Infinitive Analogues in Japanese

Contrary to the previous studies, Murasugi, Fuji and Hashimoto (2007) and Murasugi and Fuji (2008) propose that there is a RI analogue stage in Japanese.<sup>2</sup> Based on the analysis of naturalistic data of a Japanese-speaking child,

<sup>2</sup> This analysis does not contradict the descriptive findings by Sano (1995) and Kato et al. (2003). Rather, our studies are consistent with their results because the erroneous non-finite verb forms are not found with the two-year-olds, but with younger children.



Sumihare, however, at around 1;6 through 1;11, used *V-ta* form in different ways from adults. At this stage, the Modal Reference Effects are observed: The *V-ta* form semantically denotes the meaning of volition (desire) or request.<sup>6</sup>

- (16) a. Atti. Atti. Atti i -ta (1;6) (irrealis/volition) (adult form: *ik-u*, or *ik-e*)  
 there there there go-Past ‘I want to go there / Go there.’  
 b. Tii si -ta (1;7) (irrealis/volition) (adult form: *si-ta-i*)  
 onomatopoeia (pee) do-Past ‘I want to take a pee.’  
 c. Baba pai -ta (1;8) (request) (adult form: *pai-si-te*)  
 mud onomatopoeia (throw away) -Past ‘Please throw (this) away.’  
 (Murasugi, Fuji and Hashimoto 2007, Murasugi and Fuji 2008)

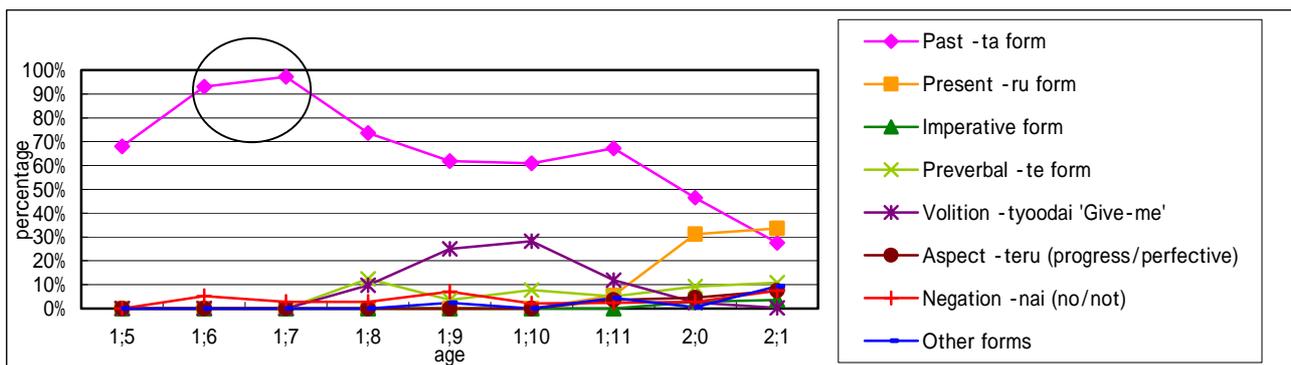
The context for (16a) is the following: Sumihare’s father (Noji, the observer) went out for a walk with Sumihare on the back. Noji tried to go back home, but Sumihare pointed to a different direction and produced “*atti* (there)” twice. Sumihare got frustrated and said, “*atti i-ta* (there go-Past)” angrily again. Noji notes on this example: *I-ta* means *ik-u* (go-Pres) while Sumihare uttered *i-ta*, because Sumihare could not say *ik-u* (Noji 1973-1977 I: 195). Noji also writes important comments for (16b), which convinces us of the Modal Reference Effects at the early stage of Japanese acquisition: Sumihare used *tii-si-ta* in a volition context when he wanted to take a pee. As for (16c), Sumihare produced *pai-ta*, attaching *-ta* on the onomatopoeia *pai* (to throw away), in order to ask his mother to remove mud from a potato.

The examples in (17) indicate cases where *-ta* is used for the result state, progressive and the irrealis meaning.

- (17) a. Baba tui -ta (1;6) (result state) (adult form: *tui-te-i-ru*)  
 thread stick-Past ‘The thread is on the finger.’  
 b. Sii si -ta (1;7) (progressive) (adult form: *sikko si-te-i-ru*)  
 onomatopoeia (pee) do-Past ‘(She) is peeing.’  
 c. Meen -ta (1;7) (irrealis) (adult form: *meen to i-u*)  
 “meen”(onomatopoeia)-Past ‘(Mommy would say,) “Meen”.’ (Murasugi, Fuji and Hashimoto 2007, Murasugi and Fuji 2008)

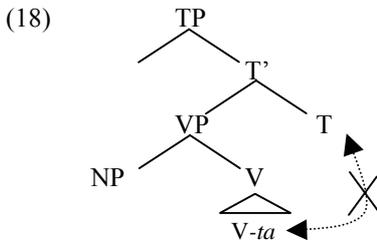
In (17a), Sumihare found a thread, *baba* (dirty), on his finger, and intended to inform his mother of this. Here, the aspectual morpheme *-te-i-ru* should be attached to the verb stem *-tui*, but Sumihare used *tui-ta*. Likewise, in (17b), Sumihare employed *V-ta* form instead of *V-te-i-ru* form for the progressive event where one of his friends was taking a pee. In (17c), Sumihare’s mother asked him what she would say if Sumihare wetted his underpants (with pee), and he intended to reply, “She would say, ‘Meen’.” Here, the present-tensed form *i-u* (to say) or the future-tensed form *-i-u-daroo* would be used in adult grammar, but *V-ta* form was used instead (Murasugi, Fuji and Hashimoto 2007, Murasugi and Fuji 2008). The percentage of *V-ta* form decreases with age; at 1;6-1;7, he predominantly used the *V-ta* form almost 100% of the time.

**Figure 1: The Overall Proportion of Verbal Forms in Sumihare’s Corpus at Each Stage**



The fact that *-ta* forms, but not the other verbal forms, such as imperatives and present-tensed forms, are consistently used to denote different meanings, would suggest that the verbal conjugation, i.e., the merger of V and inflection, is not yet available then, and this is the stage where a default form is picked up by a child for the verbal element. If this is the case, then, the whole *V-ta* form would be base-generated as an unanalyzed rote form as illustrated in (18). This stage is characterized as the one where the verbs are not merged with the head of TP.

<sup>6</sup> Suppose *V-ta* form is the reduced form of *V-tai* (volition). Then, we would expect that the *V-tai* form is acquired soon after the RI analogue stage. However, in order to convey the meaning of volition, *tyoodai* form is used productively from 1;8, and we have to wait for the adult usage of *V-tai* to be observed until around 2;6. Hence, *V-ta* form would not be the mere reduction of *-i* of *V-tai*.



At 1;8, modal meaning came to be frequently realized with *tyoodai*.<sup>7</sup> Instead of adult *si-te kudasai* (V-*te* (please-do/give-me)), which requires more than three steps of head movement, an independent verbal element *tyoodai* (please-do/give-me), without being merged, came to be productively used to convey the meaning of volition or request.

- (19) a. Tii tyoodai (1;9)  
 pee give-me 'Please help me to take a pee.'  
 b. Nainai tyoodai (1;10)  
 no-no give-me 'Please put (this) away.'

In (19a) and (19b), *tyoodai* follows the onomatopoeia *tii* (pee) and *nainai* (no-no). As shown in Figure 1 above, the rate of the non-finite past-tensed form decreases in number in accordance with the increase of *tyoodai* (please-do/give-me).<sup>8</sup>

The increase of volition with *tyoodai* form at the later stage of the Non-Finite Verb Stage would parallel the Modal Reference Effects in Dutch-type languages, where root infinitives receive a modal meaning with overwhelming frequency at the later stage.<sup>9</sup> As the merger inside the verbal projection is not possible, the child would employ the non-merging strategy, or the attachment of *tyoodai*, at this Non-Finite Verb stage, in order to verbalize the speaker's volition.

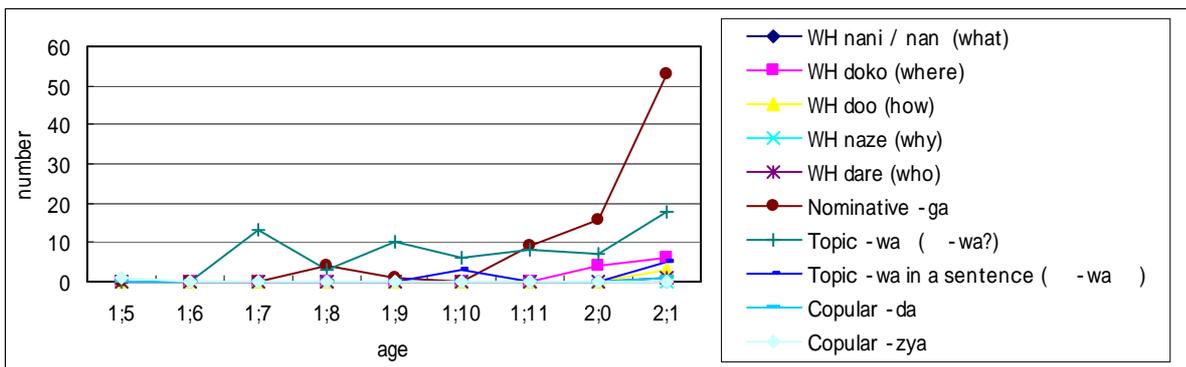
That the child is still in the Non-Finite Verb Stage when volition came to be expressed by *tyoodai* is confirmed by the fact that erroneous *V-ta* forms are still used for perfective and progressive instead of the aspectual form *V-te-i-ru*.

- (20) a. Nenne-ta -noo (1;9) (result state) (adult form: *si-te-i-ru*)  
 sleep -Past-Mood '(I)'m in the bed (with Daddy).' Context: Sumihare (the speaker) is in bed with his father.  
 b. Buu maimai -ta (1;10) (progressive) (adult form: *si-te-i-ru*)  
 plane go around-Past 'A plane is going round.' (Murasugi, Fuji and Hashimoto 2007, Murasugi and Fuji 2008)

The appropriate form to refer to the result state in (20a) would be *si-te-i-ru*, but Sumihare employed the *-ta* form instead, in order to inform his mother of the situation. In (20b), *-ta*, instead of *-te-i-ru*, is attached to the onomatopoeia, *maimai* (onomatopoeia, meaning go around), to convey the meaning of an ongoing event, "An airplane is going around."

Then, how about the presence of *wh*-questions at this stage? Interestingly, Crisma's effect is observed in Japanese, while *wh*-questions in Japanese may not require main verbs to move. Like European languages, Tense- and C-related elements (e.g., Complementizer and *wh*-phrases) are not found with the non-finite *-ta* forms, as Figure 2 shows.<sup>10</sup>

**Figure 2: Frequency of C-, T- and D-related Elements in Sumihare's Corpus**



<sup>7</sup> *Tyoodai* is the colloquial abbreviated mood auxiliary that is equivalent to *kudasai* (please-do/give-me). It is used as the main verb taking a noun complement as in (i) and as an auxiliary associated with a verb as in (ii).

(i) Ringo -(o) tyoodai (ii) Hayaku si -te tyoodai  
 an apple-Acc give me 'Give me an apple.' quickly do-preverbal please-give/please-do 'Do (it) quickly.'

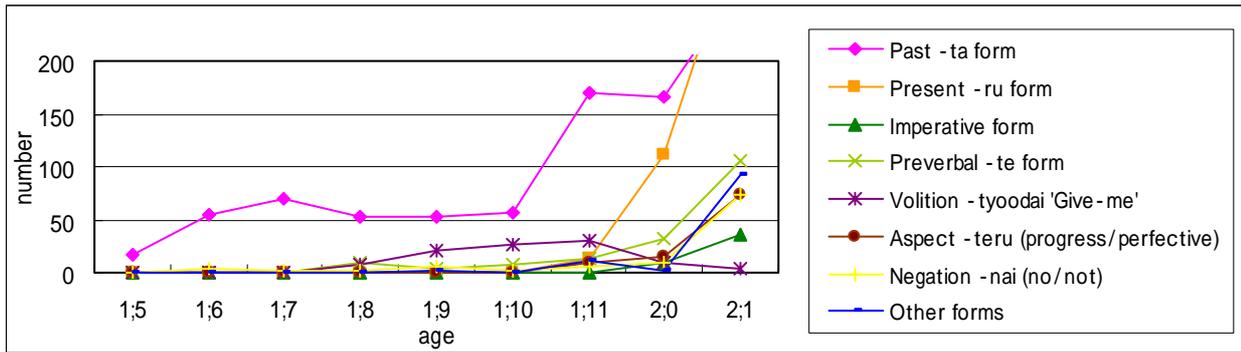
<sup>8</sup> Murasugi and Hashimoto (2004) argue that *v*-VP structure is acquired very early and *v* is initially realized as *tiyu/tita/tite* (do/did/doing). If we apply their analysis to this case, *tyoodai* produced in this stage may be the head of *v*P.

<sup>9</sup> We thank Kamil Deen for pointing out this possibility at the conference site.

<sup>10</sup> The topic marker *-wa* is produced at a very early stage, only in the form of NP-*wa*, without being associated with verbal predicates.

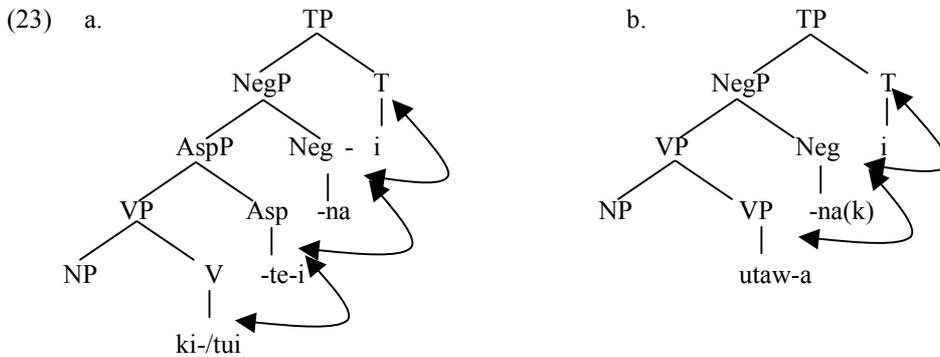


Figure 4: Frequency of Verbal Forms in Sumihare's Corpus



-*Ta* form is dominant in 1;6-1;11 (i.e., the Non-Finite Verb (RI analogue) Stage) in number; the non-past *-ru* form, the aspectual *-teru* and preverbal *-te* form started to appear after 1;11. The other inflections began to be produced after around 2;0. These facts would indicate that at least the merger of a verb with inflection is available at around 1;11.

The evidence for the unavailability of two-step head movement at this stage is elicited from the analysis of the negative sentences Sumihare produced. In adult Japanese, the negative marker *-nai* (not) is a verbal predicate which itself carries finite tense (Sano 2000), and two-step head movement (V-Neg-T) is involved. To form the adult negative predicates *ki-te-na-i* or *utawa-na-i*, two- (or more) step head movement (or merge in the PF merge analysis) is required:



However, the child at around 1;11-2;2, consistently produced the erroneous negative sentences such as (24) and (25), without making the adult-like application of head movement (or multiple application of merge in the PF merge analysis).

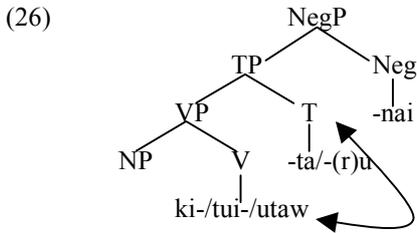
- (24) a. Tinbun ki -**ta** -nai yo (1;11) (adult form: *ki-te(i)-nai*)  
 newspaper come-Past-Neg Mood 'The newspaper has not come yet.'  
 b. MOT: Sekken-ga te -ni tui-te-i-ru kara arai nasai  
 soap -Nom hand -Dad put-Asp-Pres as wash Imperative  
 'Wash your hand. Some suds stick on your hand.'  
 SUM: Tui-**ta** nai (1;11) (adult form: *tui-te(i)-nai*)  
 put-Past Neg 'No, they don't.'

- (25) Utaw-**u** -nai (2;0) (adult form: *utaw-a-nai*)  
 sing -Pres-Neg '(Mommy) doesn't sing.'

In these examples, the negative marker *-nai* is not merged with the preverbal form *ki-te-i* or *tui-te-i*. Rather, *-nai* follows the full past-tensed verb *ki-ta* (came) in (24a) and *tui-ta* (dropped) in (24b). In (25), *-nai* even attaches to the full present-tensed verb *utaw-(r)u*.<sup>14</sup> This would suggest that the structure of (24) and (25) in child Japanese would be something like (26), which is different from the ones in adult grammar (23a, b) in that NegP is located outside of TP.

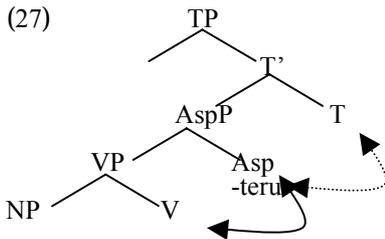
<sup>14</sup> There are a few correct negative sentences as in (ia-b). We consider those as the unanalyzed "negative forms" stored as chunk (rote) in the child lexicon, because we have to wait the past tense form *-na-k-atta* productively produced with different verbs until 2;2.

(i) a. Mie-nai ne (1;11) b. Nakanaka ko -nai ne (2;1)  
 see -Neg Mood '(We) cannot see (that).' not nearly come-Neg Mood '(The train) does not come, does it?'



The productive errors Sumihare made for negation with different types of verbs would indicate that only one merger of a verb and inflection is available at around 1;11-2;0. Here, the negative morpheme *-nai* would be base-generated as an unanalyzed form, i.e., Neg (*-na*) and T (*-i*) are not separated in the child grammar.

Further support for the unavailability of two head movement inside the verbal projection at around 1;11-2;0 is found in the morphology of aspect. Although the *V-teru* form is “correctly” used to refer the result state in (22a) and the progressive in (22b), the form in this stage is always produced as *-teru* but never as *-te-i-ru*. As the past-tensed form *-te(i)-ta* is not produced either, the *-teru* form, produced then, would be an abbreviated aspectual chunk as in (27).



At the Post-Non-Finite Verb Stage, other aspectual or mood forms, such as *V-te-simat-ta* (V-Asp (perfective)-Past), *V-ta-i* (V-*v* (volition)-Pres), which require two- (or more-) step head movement, are not produced either.

### 3.3. The Onset of Finite Verb Stage (Two-(or more-) step head merger)

Two-step head movement (or the second application of merge in the PF merge analysis) seems to be acquired at around the age of 2;1, when the adult-like verbal conjugation explosively increased. The *V-te-i-ru* form (28), *V-te-ta* form (29), and *V-toru* form (30), the *V-te-i-ru* form in Sumihare’s dialect (Setouchi Dialect<sup>15</sup>), appeared in this stage.

- (28) a. Hasit-**te-i -ru** inu (2;2) (progressive)      b. Ki **-te-i -ru** yo (2;2) (perfect)  
 run -Asp-Pres dog ‘A running dog.’                      come-Asp-Pres Mood ‘(It) has come.’

- (29) Atti -ni tomat-**te -ta** (2;2) (result state)  
 there-at stop -Asp-Past ‘(The bus) had stopped there.’

- (30) a. Oki **-toru** yo (2;2) (perfect)                      b. Keetyan-ga nai-**toru** (2;3) (progressive)  
 awake-Asp-Pres Mood ‘(The baby) is awake.’                      -Nom cry-Asp-Pres ‘Ms. Keiko is crying.’

The emergence of these forms leads us to conjecture that *-teru* form is no longer an abbreviated form. Thus, the derivation containing two-step head movement (or the second application of merge in the PF merge analysis) should be accessible.

It is also after 2;1 when Sumihare started to produce the past-tensed negative form, *V-na-katta*, as in (31).

- (31) Naka-na -katta (2;2)  
 cry -Neg-Past ‘(I) did not cry.’

The fact that Sumihare came to distinguish the past-tensed form *-na-katta* from the present-tensed form *-na-i*, would suggest that the tense morphemes *-i/-katta* are differentiated from the verb stem and the negative marker.

Although it is not clear when children move from two-step to three-step movement (or learn the multiple applications of merge in the PF merge analysis), it is only around the age of 2;3 when the multiply merged forms come to be observed:

- (32) Kazi-ni nat-te -na -katta (2;4)  
 fire -Dat be-Asp-Neg-Past ‘(It) has not caused a fire.’

<sup>15</sup> Setouchi Dialect is a dialect spoken around Ehime in the Western Japan. *V-toru* in this dialect corresponds to *V-te-i-ru* in Tokyo dialect. They are both ambiguous between progressive interpretation and perfective interpretation (Aono 2007), as shown in (i).

(i) Happa-ga oti -toru  
 leaf -Nom fall -Asp-Pres ‘A leaf is falling.’ / ‘A leaf has fallen.’

The verbal form *nat-te-na-katta* is derived via three- (or more-) head movement as represented in (23a). Sumihare, at this stage, came to be able to produce the complex, merged negative form *V-te-na-katta*.

Furthermore, the complex verbs with at least three heads begin to be joined at around 2;3.<sup>16</sup>

- (33) a. Kumot-te            ki    -ta    ne    (2;4)            b. Mata    ame hut -te            ki    -ta    yo    (2;4)  
       cloudy-Preverbal come-Past Mood            again rain fall-Preverbal come-Past Mood  
       ‘It’s getting cloudy.’                            ‘It started raining again.’

To sum, there are at least three stages in acquiring head movement (or merge in the PF merge analysis): (i) No merger of the verbs with inflection (Non-Finite Verb Stage or RI analogue stage)<sup>17</sup>, (ii) the merger of a verb with inflection available (Post-Non-Finite Verb Stage), and (iii) Two- or more-head mergers available, or the onset of Finite Verb Stage.

#### 4. Conclusion

In this paper, we investigated the correlation between the Root Infinitive analogue (Non-Finite Verb) stage in Japanese and the acquisition of head movement. We overviewed Murasugi, Fuji and Hashimoto (2007) and Murasugi and Fuji (2008) proposing that (i) there is a RI analogue stage, or Very Early Non-Finite Verb Stage in Japanese, (ii) the data analysis of Sumihare (Noji Corpus) indicates that the form is associated with the past-tensed form *-ta*, (iii) the stage is found much earlier than the European languages, i.e., even in one year-old, (iv) the form is initially (at around 1;6-1;7) used 100% of the time for past, perfectives, imperatives, and irrealis meanings, and (v) the stage basically exhibits the parallel nature with other languages summarized in (4) (except for (4a,c,g)). The T (or I) and AspectP are underspecified in this stage, while MoodP is active during the Non-Finite Verb Stage, à la Hyams (2005). Our study here would suggest that RI analogues found in Japanese are not merely due to deficits in child performance, contra Phillips (1995, 1996).

However, during the RI analogue stage, the merger of a verb with inflection is not available. At the post RI analogue (Post-Non-Finite Verb) stage, at around 1;11, only one-step head movement, in Phillip’s term, is available, and the merger of a verb and T(I) is acquired. Then, a child uses the abbreviated aspectual or negative forms without making multiple step head movement. It is only after the RI analogue stage at around age 2;1, when the multiple heads are joined. The step-by-step acquisition of head-mergers would reflect the limitation of processing, as Phillips (1995) states.

Our analyses suggest that in the [-inflected stem] languages under the Stem Parameter proposed by Hyams (1986), the so called root infinitives would be realized as the default full verbal form: the past-tensed *-Ta* form as for Sumihare, Japanese, the mood marker *-e* in Korean (Kim and Phillips 1998), the imperatives for some languages like Italian (Salustri and Hyams 2003, 2006), American and Brazilian Sign Languages (Lillo-Martin and Quadros 2008), Chinese (Chien 2008), Kuwaiti (Aljenaie 2000), and bare perfectives in Greek (Varlokosta, Vainikka and Rohrbacher 1996, Hyams 2005).

The RIs (RI analogues) would be the children’s first step to the system of the verb, and they, as Rizzi (2000) states, exhibit whatever unmarked nonfinite form the language possesses. Children, even at age one or two, pick up a default verb in the target language, e.g., root infinitives, bare forms, or full forms, depending on the language type, and use them in a commonly abstract way. The children’s common and voluntary “errors” found across languages would constitute counter-evidence against the claim that the children just imitate what they learned purely based on the adult usage.

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<sup>16</sup> The erroneous use of *V-ta* instead of *V-ru* or *V-t-ei-ru* remains even after the age of 2;2 until around 2;6. An example is given in (i).

(i) Kaatyan buranko timawa -na (=simawana). Ame-ga hut-ta yo (2;4) (progressive) (Adult form: *hut-te-i-ru*)  
       Mommy swing clean upMood rain -Nom fall-PastMood

‘Mommy, we must put the swing back. It’s raining.’ Context: Since it was raining, Sumihare asked Mommy to clean up the swing.

There are at least two possible accounts for the fact that this type of error continues to be produced even after head merger inside the verbal projection is available. One is, in line with Phillips, to consider that these are due to the performance errors. The other is to consider those as the “Optional Infinitives” although the errors are not many in number. See Murasugi and Watanabe (2008).

<sup>17</sup> Table 8 compares the numbers of sentences involving head movement in V-Neg produced at the Non-Finite Verb Stage and Finite Verb Stage found in the corpus of Sumihare.

Table 8: The Correlation between RI analogues and Head Movement with V-Neg Sentences in Sumihare’s Corpus

	no head movement	head movement
Non-Finite Verb Stage (1;6-1;10)	17	0
Finite Verb Stage (1;11-2;6)	0	139

Total=156,  $\chi^2=156.21$ ,  $p=0.0004 < 0.001$

We classify the negative forms such as *i-nai* (be-Neg) or *ika-n* (go-Neg) into the unanalyzed forms when they are used in a limited way (in number and variety). On the other hand, as for those V-Neg forms productively produced with other verbs productively, we classify them into the analyzed (differentiated) forms. The results shown in Table 8 would suggest that no sentence involving head movement inside the verbal projection is produced during Non-Finite Verb Stage, and the results are consistent with Phillips’ (1995) insight that there is no head movement in RI clauses.

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