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 Babyonychev 1999), among others, often use non-finite forms as in (1) through (3).1

(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.

1 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

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.
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.

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.

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 Hubsaube 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.’
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): Renyoukei –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 hait -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>
<thead>
<tr>
<th></th>
<th>Non-past -r/ru</th>
<th>Past-ta</th>
<th>Preverbal</th>
<th>Irrealis</th>
<th>Conjunctive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toshi (2;3-2;8)</td>
<td>288</td>
<td>84</td>
<td>0</td>
<td>0</td>
<td>1 (0.2%)</td>
</tr>
<tr>
<td>Ken (2;8-2;10)</td>
<td>111</td>
<td>175</td>
<td>0</td>
<td>1 (0.3%)</td>
<td>0</td>
</tr>
<tr>
<td>Masanori (2;4)</td>
<td>138</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

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 forms is overused. Their results are given in Table 6 and Table 7.

<table>
<thead>
<tr>
<th>Verbal Form in Ryo’s Corpus (Kato et al. 2003)</th>
<th>Past-tensed verb forms</th>
<th>Present-tensed verb forms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct Form</td>
<td>476</td>
<td>761</td>
</tr>
<tr>
<td>Erroneous Form</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Unclear</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>485</td>
<td>770</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Verbal Form in Tai’s Corpus (Kato et al. 2003)</th>
<th>Past-tensed verb forms</th>
<th>Present-tensed verb forms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct Form</td>
<td>787</td>
<td>1667</td>
</tr>
<tr>
<td>Erroneous Form</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>Unclear</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>790</td>
<td>1696</td>
</tr>
</tbody>
</table>

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.² Based on the analysis of naturalistic data of a Japanese-speaking child,

² 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 (Noji Corpus), they argue that (i) there is a Very Early Non-Finite Verb Stage in Japanese, (ii) the form in question is the past-tensed form V–ta, (iii) the stage is found much earlier than the European languages, i.e., even at one-year-old, and (iv) the form is initially (around 1;6-1;7) used 100% of the time for full range of environments. In these works, they discuss in detail the parallel nature of the stage with other languages summarized in (4).³

In this paper, in addition to the claim above, we present a piece of supporting evidence for Phillips’ (1995) insight that at the RI Stage, the merger of the verb with inflection is not available. More specifically, we argue that merger of the head is acquired step by step as summarized in (11).

(11) a. Non-Finite Verb (RI analogue) Stage (1;6-1;11): No merger of the verb with inflection available
   b. Post-Non-Finite Verb Stage (1;11-2;1): the merger of the verb and the inflection available
   c. Onset of Finite Verb Stage (2;1-): Two- (or more-) head mergers available

We argue that there is a stage in Japanese acquisition where a non-finite verb form is used in adult-like as well as non-adult-like meaning, and this non-finite verb is produced by a child as young as one year old, when the merger of the verb with inflection is not yet acquired.

3.1. The Very Early Non-Finite Verb Stage (The stage of no merger of V-T)

Japanese is an agglutinating language with multiple head movements inside the verb projection. (See Koizumi 1995.)⁴ In adult Japanese, the bare verb stems cannot appear without tense or aspect morphemes, as shown in (12) and (13).

(12) a. *tabe- ‘to eat’ b. *suwar- ‘to sit’
(13) a. tabe-ru/-ta b. tabe-te-i -ru/-ta
   eat -Pres/Past ‘(I) eat/ate.’ eat -Asp-Pres/Past ‘(I) have/had eaten.’ / ‘I am/was eating.’
   c. tabe-te c. d. tabe-ta -i
   eat -Imperative(Preverbal form) ‘(Please) eat.’ eat -want-Pres ‘(I) want to eat.’

The verb stem tabe- (to eat) is followed by the present-/past-tense morphemes in (13a), and by the aspectual morpheme -te-i to indicate both the ongoing process and the result state of the event in (13b).⁵ For request or imperative, the morpheme -te attaches to the verb as in (13c), while for volition, -ta-i is attached to the verb as in (13d). The structures of V with tense and aspectual morphemes are represented in (14). The merger of V and T is required to derive a tensed sentence as in (14a). For an aspectual sentence, as in (14b), two-step head merger (V-Asp-T) is required.

(14) a. b.

The complex conjugations, however, are not produced at the very early stage of Japanese acquisition. Below we argue that there is a stage where a uniform verbal form is employed for non-adult meanings, which we term the Very Early Non-Finite Verb Stage, and the inflectional features (including T (I)) are not successfully merged with the verb.

Sumihare started using the past-tensed form, -ta form, referring to the perfective event in the same way as adults in the mid one-year old, as shown in (15) (Murasugi, Fuji and Hashimoto 2007, Murasugi and Fuji 2008).

(15) a. Buu  ki  -ta (1;5) b. Tabe-ta  (1;6)
onomatopoeia come-Past ‘A car has come.’ eat -Past ‘(I) ate (up) (an apple).’
c. Oti-ta (1;7) d. Keityan yuu-ta (=it-ta) (1;8)
fall-Past ‘(It) has fallen.’ say-Past ‘(She) said Keityan.’

³ Noji corpus is chosen for this study because it contains detailed contexts for the child’s utterances, which helps us to detect the intended meanings. Noji’s comments as the observer and as a linguist are also very helpful for making generalizations.
⁴ If we adopt the PF merge analysis (Bošković 2003, among others), our findings will be interpreted as a limitation in the number of elements that can be merged in the child’s derivation, and RI analogues arise because of the failure to merge the verb with inflection.
⁵ The abbreviated V-tesu/teta forms as in (i) are used as colloquial expressions in adult Japanese.
(i) tabe-te -ru/-ta
   eat -Asp-Pres/-Past ‘(I) have/had eaten.’ / ‘(I) am/was eating.’
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.\(^6\)

(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: 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

![Proportion of Verbal Forms](image)

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.

\(^6\) 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. 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.

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).

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. 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.

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.

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

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7 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 -> tyoodai an apple-Acc give me ‘Give me an apple.’
(ii) Hayaku si-te tyoodai quickly do-preverbal please/give/please-do ‘Do (it) quickly.’

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

9 We thank Kamil Deen for pointing out this possibility at the conference site.

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

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These data would indicate that the RI phenomena are not merely due to the performance deficits of children. Rather, as Hyams (2005) discusses, MoodP is active during the Non-Finite Verb (RI analogue) Stage, while the AspectP and TP are still underspecified and the head movement inside the verbal projection is still unavailable. The evidence for the underspecification of T is also found in the absence of other T (or I) elements at the stage in question. Nominative Case marker –ga and the finite be (da/zya, the copula) are not observed either then in Sumihare’s corpus, which would reconfirm the possibility that the stage is due to the deficits in (the realization of the feature of) T (or I).

Then, how about Krämer’s effect? Like other languages, Sumihare initially produced null subjects frequently with a lot of verbs, though the rate of null subjects sometimes decreases, and sometimes not, depending on the verbs. As shown in Figure 3, the percentage of null subjects of such speaker-oriented verbs as pai (to throw away) or suru (to do), where the subject tends to be Ego, stays high even after the inflections (conjugations) appear after two. On the other hand, the subject (topic) conveying the new information with eventive verbs such as oti-ru (to drop) and kuru (to come) does NOT tend to be null. This is different from the findings reported in the studies of non-null-subject languages, though it may not be surprising given that Japanese is a discourse-pro language.

Figure 3: Proportion of Null Subjects of Each Verb in Sumihare’s Corpus

It has been observed that children speaking the agglutinative languages, e.g., Tamil (Raghavendra and Laurence 1989) and Turkish (Asc-Koç and Slobin 1985), acquire the verb inflections at a very early stage. As Murasugi, Fuji and Hashimoto (2007) and Murasugi and Fuji (2008) discuss, the early emergence of RI analogues in such languages as Japanese, Korean (Kim and Phillips 1998), Italian (Salustri and Hyams 2003, 2006), American and Brazilian Sign Languages (Lillo-Martin and Quadros 2008), Chinese (Chien 2008), Arabic (Aljenaie 2000), and Greek (Varlokosta et al. 1996, Hyams 2005), will be explained by a morphological parameter, Stem Parameter proposed by Hyams (1986), which is responsible for the well-formedness of verbal bare stems in a language. (See also Aljenaie 2000, Hyams 2008.) According to this hypothesis, English, for example, takes a value [+inflected stem], as verbs can surface as bare stems. On the other hand, in such languages as Japanese, the parameter takes the opposite value, [-inflected stem], because verbs cannot surface as bare stems. Children acquiring Japanese will learn the verb conjugations earlier than English speaking children because, given the Japanese setting of the parameter, there is no option of omitting the verb conjugations.

3.2. The Post-Non-Finite Verb Stage (The head merger of V-Asp/V-T)

The merger of a verb and inflection came to be available at around 1;11, when Sumihare started producing the “correct” non-past form V-ru as in (21) in the proper contexts (Murasugi, Fuji and Hashimoto 2007, Murasugi and Fuji 2008).

(21) a. Ik -u -yoo (1;11) (present)   b. Okku a -ru -yo (1;11) (present)
go-Pre-Mood ‘(I)’ll go to (Tiiko’s house).’ medicine be-Pres-Mood ‘Here is the medicine.’

Sumihare also started producing the abbreviated aspectual form -teru at around the age of 1;11. As shown in (22a) and (22b), the form is used for result state and progressive. The frequency of each verbal form is illustrated in Figure 4.

(22) a. Wanwan tyan si -teru (1;11) (result state)   b. Buranko ti -teru (2;0) (progressive)
dog sit do-Asp ‘A dog is sitting (here).’ swing do-Asp ‘(A scarecrow) is swinging.’

11 Although the verb movement may be involved in the assignment of Nominative Case (Huang 1987, Otani and Whitman 1991), the Nominative Case -ga does not appear on subjects at the RI analogue stage. The Nominative Case marker -ga appears at around 1;11.
12 NF stands for Non-Finite Verb Stage, which is divided into two sub-stages: NF-I is the stage where V-ta form is used almost 100% of the time and NF-II is the stage where modal meaning is realized with the form tyoodai. P-NF stands for Post-Non-Finite Verb Stage.
13 Kim and Phillips (1998) argue that the overuse of the default mood-inflection ‘-e’ in the earliest speech of a Korean child parallels RIs in other languages, and report that there is no correlation between the RI analogue form and the number of null subjects produced at the stage. See Murasugi and Fuji (2008) for the arguments of the parallelism in RI analogue stages in Japanese and Korean.
-Tu 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:

\[
\text{NegP} \rightarrow \text{VP} \rightarrow \text{NP}
\]

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.\(^{14}\) 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.

\(^{14}\) 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), appeared in this stage.

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.

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:  

15 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).
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;3.16

(33) a. Kumot-te cloudy-Preverbal come-Past Mood ‘It’s getting cloudy.’
      ki –ta ne (2;4) b. Mata again rain fall-Preverbal come-Past Mood
      ama hut-te yo (2;4) ‘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)17, (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.

Selected References


16 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-ru) Mommy clean up Mood rain -Nom fall-Past Mood

‘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).

17 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>
<thead>
<tr>
<th>Table 8: The Correlation between RI analogues and Head Movement with V-Neg Sentences in Sumihare’s Corpus</th>
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<tbody>
<tr>
<td>Non-Finite Verb Stage (1;6-1;10)</td>
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<tr>
<td>Finite Verb Stage (1;11-2;6)</td>
</tr>
<tr>
<td>Total=156, $\chi^2 =156.21, p=0.0004 &lt;0.001$</td>
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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 (differenciated) 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.