Are There Root Infinitive Analogues in Child Japanese?

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1. Introduction

It has been cross-linguistically observed that children at an early stage of language acquisition optionally use a non-finite verbal form as a main verb in a matrix clause, as in (1) (Rizzi 1994, Wexler 1994, among others). This phenomenon is well known under the term *Root Infinitives*.

(1) a. Dutch
       Papa   schoenen   wassen.
       Daddy shoes   wash-INF

(Weverink 1989)

   b. German
       Zahne   pussen.
       teeth   brush-INF

(Wexler 1994)

   c. English
       That truck fall down.

(Sano & Hyams 1994)

In the case of Japanese, Murasugi and Fuji (2009) and Murasugi, Fuji and Hashimoto (2010) claim that Japanese-speaking children's non-adult-like use of 'V-*ta*' (Verb + a past tense morpheme) forms what can be called Root Infinitive Analogues (henceforth RIAs). In the present study, however, we show that contrary to their claim, non-adult-like use of 'V-*ta*' in child Japanese is not a general phenomenon and that the lack of Nominative Case and the putative existence of RIAs in child Japanese do not come from the same source (namely, deficits in T, according to Murasugi and Fuji (2009) and Murasugi et al. (2010)).

2. Root Infinitive Analogues in Japanese

According to Murasugi and Fuji (2009) and Murasugi et al. (2010), RIAs in Japanese are manifested as follows. A past tense morpheme *ta* is attached to a verb, yielding the form 'V-*ta*'. The 'V-*ta*' form is used in a non-adult-like manner in child Japanese; two children, Sumihare (in the Noji corpus in the CHILDES Japanese Database) and Akkun (Murasugi et al. 2010), used the 'V-*ta*' form to express not only 'Past' but also to express 'Volition', 'Progressive', 'Request', or 'Present'. This stage holds until around 1;11, and the verb form is initially (1;6–1;7) used 100% of the time.

(2) a. Form: Verb + *ta* (a past tense morpheme)
   b. Non-adult-like use: Not only for 'Past' but also for 'Volition', 'Progressive', 'Request', and 'Present'
   c. RIA stage (period): one year old (until around 1;11)
   d. Initially (around 1:6–1;7), the 'V-*ta*' form is used 100% of the time.

Murasugi and Fuji (2009) observed the non-adult-like use of the 'V-*ta*' form in the informant Sumihare's utterances. In adult Japanese, 'V-*tai*' is used to express 'Volition'. However, Sumihare used *si-ta* (i.e., 'V-*ta*') instead of *si-tai* (i.e., 'V-*tai*'). In addition, although 'V-*te*' is used for 'Requesting' in adult Japanese, Sumihare used *pai-ta* (i.e., 'V-*ta*') instead of the 'V-*te*' form. Murasugi et al. (2010) provided corroborating evidence from another child, Akkun, who also overused the 'V-*ta*' form. Below are examples of the use of the 'V-*ta*' form overused for 'Volition' and 'Request' from the Murasugi and Fuji (2009) and Murasugi et al. (2010) studies.

(3) a. Volition (adult: V-*tai*)
    Tii   si-ta. (1;7)
    onomatopoeia (pee)   do-PAST
    'I want to take a pee.'

   b. Request (adult: V-*te*)
    Baba   pai-ta. (1;8)
    mud   onomatopoeia (throw away)-PAST
    'Please throw (this) away.'

(Murasugi and Fuji 2009)

(4) Request (adult: V-*te*)
    Akkun   mama   tat-ta (1;9)
    A   Mommy   stand-PAST
    'Akkun (/I) wants Mommy to stand up.'

(Murasugi et al. 2010)

Why did the children misuse the 'V-*ta*' form? According to Murasugi and Fuji (2009) and Murasugi et al. (2010), one-year-old children cannot merge V with T since there are deficits in T in child Japanese grammar, and the 'V-*ta*' form is base-generated in the head of V. In addition, the Japanese Nominative Case marker *ga*, which is assumed to be assigned by T, is not observed in Sumihare's utterances. According to Murasugi and Fuji (2009) and Murasugi et al. (2010), this reconfirms the existence of deficits in T (for Sumihare).

   However, it seems too early to conclude that both the existence of RIAs and the lack of Nominative Case come from the deficits in T, since that claim is based on only a small number of examples from only two children. In order to conclude that the two phenomena come (or do not come) from the same source, further research is required. If the claim of Murasugi and Fuji (2009) and Murasugi et al. (2010) is on the right track, (a) we should observe RIAs in other one-year-old Japanese children's utterances, and (b) we should not observe the Nominative Case marker *ga* in those children's utterances. These predictions are summarized in Table 1.[1]

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[1] Murasugi et al. (2010) do not report whether Akkun also did not produce the Nominative Case marker *ga*. However, if their analysis is on the right track, Akkun should also fall into the upper right cell (RIAs but no *ga*).

Table 1: Predictions

		Nominative Case	
		Observed	Not Observed
RIAs	Observed	Not Predicted	Predicted (Sumihare)
	Not Observed	Predicted (Adult-like)	Not Predicted

As shown in Table 1, if children do not produce the Nominative Case marker *ga* but do produce RIAs, they fall into the upper right category, that is, their pattern is the same as Sumihare's pattern. According to Murasugi and Fuji (2009) and Murasugi et al. (2010), this pattern is expected to be the most typical. It might also be expected, however, that some children show adult-like behavior, that is, that they do not produce RIAs but do produce the Nominative Case marker *ga*. This pattern falls in to the lower left category, namely, the adult-like pattern. The other two cases will not be predicted if both the existence of the RIAs and the lack of *ga* come from the same source (deficits in T).

3. Investigations of children's corpora
3.1. Root Infinitive Analogues in four children's data

In order to examine this prediction, we examined utterances from four children (Jun, Nanami, Ryo, and Tai) in the CHILDES database (MacWhinney 2000). Detailed information is given in Table 2. In order to compare the four children's utterances with Sumihare's utterances, we investigated their data at age 1.

Table 2: CHILDES Data for Four Children

Name	Corpus	Age	File
Jun	Ishii	1;10–1;11	11015.cha–11126.cha
Nanami	MiiPro	1;6–1;9	njd19971220.cha–njd19980412.cha
Ryo	Miyata	1;10–1;11	r11005.cha–r11128.cha
Tai	Miyata	1;5 1;9	tai10520.cha–tai10925.cha

In this study, we investigated (a) whether these four children uttered correct verb forms for relevant contexts (expressing volition, making a request, and so on), and (b) whether the four children uttered the Nominative Case marker *ga* (on the basis of an examination of overt subjects and wh-phrases). First, let us look at the results for investigation (a), on the existence of RIAs in each child's utterances.[2]

Table 3 presents Jun's utterances. We classified verb forms based on context, into 'Volition' ('V-*tai*'), 'Request' ('V-*te*'), 'Present' ('V-*(r)u*'), 'Past' ('V-*ta*'), 'Progressive' ('V-*te(i)ru*'), and 'Unclear'. According to Murasugi and Fuji (2009) and Murasugi et al. (2010), we will expect to observe misuse of the 'V-*ta*' form not only for 'Past' but also for other contexts. The total number of 'V-*ta*' forms observed in Jun's utterances was 89, in 85 of which it was used correctly for 'Past'. In other words, Jun used the 'V-*ta*' form in an adult-like way, for 'Past', in almost all cases, and the expected misuse of 'V-*ta*' is rare.

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[2] We excluded the children's repetitions of child-directed speech addressed to them from our analysis.

Table 3: Jun's Utterances

	Volition (V-*tai*)	Request (V-*te*)	Present (V-*(r)u*)	Past (V-*ta*)	Progressive (*V-te(i)ru*)	Unclear Context
tai	0	0	0	0	0	0
te	0	2	0	0	0	10
(r)u	0	0	1	0	0	0
ta	0	0	0	85	1	3
te(i)ru	0	0	0	0	0	0

Next, let us consider Nanami's utterances. As shown in Table 4, her total number of 'V-*ta*' tokens was 31, and we did not observe her misusing it. In other words, she too used the 'V-*ta*' form in a completely adult-like manner. In addition, for 'Request' and 'Present', Nanami correctly used 'V-*te*' and 'V-*(r)u*' in all cases, although the number of these utterances was relatively small.

Table 4: Nanami's Utterances

	Volition (V-*tai*)	Request (V-*te*)	Present (V-*(r)u*)	Past (V-*ta*)	Progressive (*V-te(i)ru*)	Unclear Context
tai	0	0	0	0	0	0
te	0	10	0	0	0	0
(r)u	0	0	11	0	0	0
ta	0	0	0	31	0	0
te(i)ru	0	0	0	0	0	1

Next let us see Ryo's utterances. The total number of 'V-*ta*' tokens observed in his utterances was 19, of which 18 utterances were correctly used to express the 'Past'. The intended meaning of the remaining utterance was not clear from the context. In short, no misuse of the 'V-*ta*' form was observed in Ryo's utterances.

Table 5: Ryo's Utterances

	Volition (V-*tai*)	Request (V-*te*)	Present (V-*(r)u*)	Past (V-*ta*)	Progressive (*V-te(i)ru*)	Unclear Context
tai	0	0	0	0	0	0
te	0	7	0	0	0	0
(r)u	0	0	4	0	0	0
ta	0	0	0	18	0	1
te(i)ru	0	0	0	0	0	0

Finally, let us consider Tai's utterances, of which there are a larger number than for the other children. In Tai's utterances, we observed 250 tokens of the 'V-*ta*' form, of which 249 were used in an adult-like way. In addition, for 'Request' and 'Present', Tai correctly and productively used 'V-*te*' and 'V-*(r)u*' in almost all cases. If the analysis discussed in Murasugi and Fuji (2009) and Murasugi et al. (2010) were on the right track, we would expect to observe the child using the 'V-*ta*' form in these contexts; however, as for the other children, such non-adult-like use of the 'V-*ta*' form was almost never observed.

Table 6: Tai's Utterances

	Volition (V-*tai*)	Request (V-*te*)	Present (V-*(r)u*)	Past (V-*ta*)	Progressive (*V-te(i)ru*)	Unclear Context
tai	11	1	0	0	0	0
te	0	80	0	0	0	0
(r)u	0	0	90	0	0	0
ta	0	0	0	249	0	1
te(i)ru	0	0	0	0	3	0

Let us summarize the CHILDES data in Table 7.

Table 7: Total Utterances of the Four Children

	Raw Number of Utterances of 'V-*ta*'	After Exclusion	Non-adult-like use of 'V-*ta*'	Utterances of 'V-*ta*' in unclear contexts
Jun	116	89	1	3
Nanami	46	31	0	0
Ryo	28	19	0	1
Tai	338	250	0	1
Total	528	389	1	5

The raw total number of tokens of the 'V-*ta*' form was 528; after exclusion of the children's repetitions of child-directed speech, the final total number of instances of 'V-*ta*' was 389, of which only 1 was non-adult-like. This result suggests that RIAs in child Japanese, which were discussed in Murasugi and Fuji (2009) and Murasugi et al. (2010), were not observed at a substantial rate. This observation casts doubt on the view that RIAs come from non-adult-like grammatical knowledge in young Japanese children.

3.2. Nominative Case in the four children's data

To begin our discussion of Nominative Case in the children's data, we would like to note that, even in adult Japanese, Case markers can be dropped for some predicates and contexts (cf. Kageyama 1993). Thus, for our present purposes, we need to focus on phrases or sentences in which Case-dropping is not allowed in adult Japanese. Wh-phrases are one such context, since they require obligatory Case-attachment in the subject position of unergatives and transitives. Therefore, in order to investigate whether or not the four children used the Nominative Case marker *ga* where dropping it is not allowed in adult Japanese, we intended to examine their use of wh-phrases. However, wh-phrases were never produced in the children's data, making this impossible.

We also examined all instances of subject phrases with the Nominative Case marker *ga* in the four children's corpora. Here, we would like to note that even overt subjects can be dropped (i.e., null subjects can appear) in Japanese, which is a pro-drop language. Given this, it may be that overt subjects will rarely be produced at an early stage; and if overt subjects are rare, it is very likely that we will not observe many instances of the Nominative Case marker *ga* in the children's utterances, since it cannot be attached to a null subject. In other words, if overt subjects are rare, possible contexts for the occurrence of Nominative Case marker *ga* will also be rare. Therefore, we counted the number of overt subjects in these one-year-old children's utterances.

Furthermore, however, according to Watanabe (2008) and Murasugi and Watanabe (2009), the Nominative Case marker *ga* could appear at an early stage only when predicates are unaccusative. That is, they claim that the Nominative Case marker *ga* is assigned by T in transitive/unergative sentences and by unaccusative verbs in VPs in unaccusative sentences. Thus, even if there are deficits in T in child Japanese at an early stage, these deficits will be irrelevant in terms of the production or use of the Nominative Case marker *ga* when the predicate uses an unaccusative verb, according to Watanabe (2008), and Murasugi and Watanabe (2009). Under this analysis, it will be expected that we will

observe the children using the Nominative Case marker *ga* only when they utter an unaccusative. Hence, we examined predicates of sentences in which the Nominative Case marker *ga* was produced in order to clarify their types.

First, let us look at Jun's utterances. As mentioned above, we classified predicates into unaccusatives and others, since there remains a possibility that the Nominative Case marker *ga* can be produced at an early stage when the predicate is unaccusative. However, in Jun's utterances, not even overt subjects are produced, and nor is the Nominative Case marker *ga*.

Table 8: The Number of Nominative Cases in Jun's Utterances

Types of Predicates	Unaccusative	Unergative
	0	0
Total Number of Overt Nominative Case Tokens	0	

Second, let us consider Nanami's utterances. Like Jun, she rarely produced overt subjects, only 2 in all, and only 1 utterance of the Nominative Case marker was observed in her speech.

Table 9: The Number of Nominative Cases in Nanami's Utterances

Types of Predicates	Unaccusative	Unergative
	0	1
Total Number of Overt Nominative Case Tokens	1	

Next, we look at Ryo's utterances, in which the number of overt subjects was only 3. In other words, Ryo, like Jun and Nanami, rarely produced overt subjects, nor was the Nominative Case marker *ga* observed in his utterances.

Table 10: The Number of Nominative Cases in Ryo's Utterances

Types of Predicates	Unaccusative	Unergative
	0	0
Total Number of Overt Nominative Case Tokens	0	

Finally, let us consider Tai's utterances. In Tai's data, 49 overt subjects were observed, a number that is relatively larger than for the other children. In these 49 overt subjects, Tai produced 12 utterances of the Nominative Case marker *ga*. Thus, compared with the other children, Tai produced more overt subjects and more *ga*s. However, the number is not substantially large. Moreover, out of the 12 instances of *ga*, 5 appeared with unaccusatives and 7 with other constructions, such as unergatives, transitives, and adjectives. Thus, although according to Watanabe (2008) and Murasugi and Watanabe (2009) the Nominative Case marker should be observed only with unaccusatives at this stage, in fact it is observed with other constructions as well. Thus, here again, the expectation of the previous studies is not met in the results of our further investigation.

Table 11: The Number of Nominative Case in Tai's Utterances

Types of Predicates	Unaccusative	Unergative
	5	7
Total Number of Overt Nominative Case Tokens	12	

Let us now look at the overall results, Table 12.

Table 12: Total Utterances of the Four Children

	Total Number of Nominative Case Tokens	Nominative Case Tokens with Unccusatives	Nominative Case Tokens with Other Predicates
Jun	0	0	0
Nanami	1	0	1
Ryo	0	0	0
Tai	12	5	7
Total	13	5	8

Across all four children's data, we observed only 13 utterances of the Nominative Case marker *ga*, almost all of which were in utterances by Tai. This investigation thus reveals that one-year-old Japanese children rarely produce overt subjects or the Nominative Case marker *ga*.

4. Discussion

First, let us consider the summary given in Table 13.

Table 13: Summary of the Investigation

		Nominative Case	
		Observed	Not Observed
RIAs	Observed	Not Predicted	Predicted (Sumihare)
	Not Observed	Predicted (Adult-Like)	Not Predicted (Jun, Nanami, Ryo)

We would like to remind the reader once again here that Sumihare's pattern is expected to be the most common according to Murasugi and Fuji (2009) and Murasugi et al. (2010); that is, RIAs should be observed in the data, but the Nominative Case marker *ga* should not. However, this prediction was not borne out. Three children (Jun, Nanami, and Ryo) fell into the lower right pattern, in which neither RIAs nor *ga* was observed at a substantial rate. In Tai's utterances, RIAs were almost never observed, and *ga* was rare. Thus, Tai's utterances might potentially fall into the lower right pattern, like those of the other children, or the lower left pattern, that is, the adult-like pattern. However, if this is taken to imply that Tai has already acquired adult-like T, this would be very early acquisition. To determine for sure whether Tai actually falls into the adult-like (lower left) pattern, we need to compare the number of *ga*s observed in Tai's utterances with that in adult Japanese. We leave this point for future research.

To summarize, the misuse of the 'V-*ta*' form was not observed in the four children's data at a substantial rate, contrary to our expectation based on the claim by Murasugi and Fuji (2009) and Murasugi et al. (2010). Out of 389 utterances of 'V-*ta*', only 1 was non-adult-like. This observation casts doubt on the view that Sumihare's misuse of the 'V-*ta*' form was a reflection of non-adult-like grammatical knowledge (that is, deficits in T) at an early stage. If this were so, an RIA stage should be observed in the four children's utterances.

Based on Murasugi and her colleagues' analysis, suppose that the four children almost never misused the 'V-*ta*' form, since there were no deficits in T (that is, T was adult-like). Then, we would expect to observe instances of the Nominative Case marker *ga* in the children's data. However three of the children, Jun, Nanami, and Ryo, almost never produced it; and although Tai did produce it, it was only rarely. In total, we observed only 13 utterances of *ga* in the four children's data. This result challenges the correlation between the misuse of *ta* and the lack of the Nominative Case marker *ga* in child Japanese. It thus seems likely that the non-adult-like use of the 'V-*ta*' form and the lack of Nominative Case in Sumihare's utterances come from different sources.

Before concluding, we would like to point out some peculiarities regarding Sumihare's data. Sumihare's utterances were recorded in shorthand by his grandfather; thus, whether some utterance was

recorded or not was up to Sumihare's grandfather's discretion. Hence, there is a possibility that Sumihare's files might be biased or inaccurate. For instance, his non-adult-like utterances might have drawn disproportional attention and been recorded more often than his adult-like utterances.[3] In contrast, all the data used in the present paper were files transcribed from audio-/video-recordings. Thus, the differences we found between Sumihare's data and the data we considered may come from differences in data recording format. Furthermore, we would like to point out some problems with the analysis discussed in Murasugi and Fuji (2009) and Murasugi et al. (2010). As discussed above, they claim that the Nominative Case marker *ga* was not observed in Sumihare's utterances. However, their studies did not mention the number of overt subjects in the children's utterances. Our investigation reveals that one-year-old children rarely produce even overt subjects. Thus, there is a possibility that Sumihare at age 1 also rarely produced overt subjects. In addition, they did not examine context in their investigation of whether Sumihare uttered the Nominative Case marker *ga*. In adult Japanese, *ga* is attached to subjects when the sentence describes new information (Kuno 1973). Given this, a question arises. In Sumihare's data at age 1, to what extent were contexts in which we would expect the Nominative Case marker *ga* in adult Japanese? Given that such contexts are not so abundant in general, it may be that there were no or few such contexts in Sumihare's data at age 1. If so, it would be no wonder that Sumihare did not produce *ga*. We would like to leave this issue as well for future research.

5. Conclusion

To conclude, our investigation reveals that misuse of the 'V-*ta*' form (in the terms of Murasugi and her colleagues, Root Infinitive Analogues or RIAs) is not observed at a substantial rate in one-year-old Japanese children's utterances. Hence, we would like to suggest that the putative RIA phenomenon in child Japanese is not a general phenomenon. In addition, utterances of overt Nominative Case are not often observed in the data we considered, either. Thus, this study also challenges the claim by Murasugi and Fuji (2009) and Murasugi et al. (2010) that the putative existence of RIAs and the lack of Nominative Case both come from the deficits in T in children's grammar at this stage.

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[3] Akkun's utterances as reported in Murasugi et al. (2010) were recorded/transcribed by Akkun's mother, 10 hours a week on average. Some crucial sentences were also elicited by the authors. See Murasugi et al. (2010).

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