Zibun-anaphora in child Japanese and nominative objects in potential sentences*

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1. Introduction

This paper presents an experimental study on how the *zibun*-anaphor is acquired in child Japanese. The reflexive anaphor *zibun* in Japanese is constrained when it refers to its antecedent, as pointed out by Kuroda (1965).

(1) Taro$_i$-ga Hanako$_j$-ni zibun$_{i/*j}$-no e-o miseta.
Taro-Nom Hanako-Dat self-Gen picture-Acc showed
'Taro$_i$ showed Hanako$_j$ a picture of himself$_{i/*j}$.'

(Otsu 1997)

(2) Ahiru$_i$-ga usi$_j$-o zibun$_{i/*j}$-no niwa-de oikaketa.
duck-Nom cow-Acc self-Gen garden-in chased
'The duck$_i$ chased the cow$_j$ in his$_{i/*j}$ garden.'

(Murasugi and Kawamura 2005)

In example (1), the nominative-marked NP *Taro* can be the antecedent of *zibun*, but the dative-marked NP *Hanako* cannot. In example (2), the nominative-marked NP *duck* can be the antecedent of *zibun*. On the other hand, the accusative-marked NP *cow* cannot be its antecedent.

So far, these examples suggest that the antecedent of *zibun* is not a dative-marked NP or an accusative-marked NP but a nominative-marked NP. However, as pointed out by Ura (1999), a nominative-marked object cannot be the antecedent of *zibun* in a potential sentence of the following kind:

(3) Taro$_{i}$-ga Ziro$_{j}$-ga zibun$_{i/*j}$-no heya-de onbu-deki-ta.
Taro-Nom Ziro-Nom self-Gen room-in piggyback-can
'Taro$_{i}$ was able to piggyback Ziro$_{j}$ in his$_{i/*j}$ room.'

In sentence (3), *zibun*'s antecedent is the subject *Taro* with the nominative-marker *ga*, but it cannot be the object *Ziro*, which also has the nominative-marker *ga*. This indicates that whether an NP can be an antecedent of *zibun* does not depend on which Case the NP has. Rather, the antecedent of *zibun* is restricted by the grammatical function; the subject can be an antecedent of *zibun* but the object cannot be. This is called the "subject-orientation" property.

I conducted an experiment to investigate whether Japanese-speaking children know that the *zibun* anaphor cannot take a nominative-marked object as its antecedent in potential sentences such as (3). According to my results, it seems that it is possible that children's *zibun*-anaphor may be nominative-oriented rather than subject-oriented. The organization of this paper is as follows. In section 2, I review two previous studies of *zibun* acquisition, Otsu (1997) and Murasugi and Kawamura (2005), and I point out a further issue of their experiments. Then I report the results of my experiment in section 3. The implications of the results are discussed in section 4.

2. Previous studies

2.1. Otsu (1997)

Otsu (1997) attempted to determine whether Japanese-speaking children have the subject-orientation property of *zibun*, with sentence (4) repeated from sentence (1).

(4)	Taro$_i$-ga	Hanako$_j$-ni	zibun$_{i/*j}$-no	e-o	miseta.
	Taro-Nom	Hanako-Dat	self-Gen	picture-Acc	showed

‘Taro$_i$ showed Hanako$_j$ a picture of himself$_{i/*j}$.’

If children know the subject-orientation property, they choose *Taro*, rather than *Hanako*, as its antecedent in sentence (4).

The method used in the experiment was a kind of the Truth Value Judgment Task (Crain & Thornton 1998). A puppet and two dolls are used for the experiment. The participant and the puppet cannot see what the two dolls do. The experimenter informs the participant of the dolls’ actions using a sentence such as (4), but the experimenter does not share this information with the puppet. Then, the puppet is asked about their actions. The task for the participant is to judge the puppet’s answer.

The results of Otsu (1997) show that all of these children except one three-year-old interpreted sentences such as (4) in an adult-like way. Thus, Otsu concluded that three-year-old children have already acquired the subject-orientation property of *zibun*.

2.2. Murasugi and Kawamura (2005)

Murasugi and Kawamura (2005) conducted an experiment with the

example in (2), repeated here as sentence (5), and its scrambled version (6).

(5) Ahiru-ga usi-o zibun-no niwa-de oikaketa.
duck-Nom cow-Acc self-Gen garden-in chased
'The duck chased the cow in his(= the duck/*the cow) garden.'

(6) Usi-o_i [zibun-no niwa-de]$_j$ Ahiru-ga t_i t_j oikaketa.
cow-Acc self-Gen garden-in duck-Nom chased
'The cow, in his(= the duck/*the cow) garden, the duck chased.'

In these sentences, *zibun*'s antecedent is the nominative-marked subject *duck*, but it cannot be the accusative-marked object *cow*.

They tested 22 children, ranging from the ages of two to six. The method used was the Act-Out Task, in which the participant's task is to demonstrate, by using toys, what the test sentence means. Before the test sentences, sentences such as (7) and its scrambled version (8) were used as control sentences.

(7) Ahiru-ga usi-o oikaketa.
duck-Nom cow-Acc chased
'The duck chased the cow.'

(8) Usi-o_i Ahiru-ga t_i oikaketa.
cow-Acc duck-Nom chased
'The cow, the duck chased.'

The results show that even three-year-old children are adult-like in interpreting the test sentences in (5) and (6), as long as they are perfectly

adult-like with the control sentences in (7) and (8).[1] Hence, the finding supports Otsu's work.

2.3. A further issue

In Otsu (1997) and Murasugi and Kawamura (2005), children took the nominative-marked subject to be *zibun*'s antecedent and did not take the dative-marked object or the accusative-marked object. Hence, their findings seem consistent with the view that children at an early stage have acquired the subject-orientation property of *zibun*. However, in their experiments, it is still possible that children may choose *zibun*'s antecedent not because it is the subject but, because it is assigned a nominative-Case. If so, children follow what we may call "nominative-orientation", rather than subject-orientation.

Due to this ambiguity, a further issue is to examine whether children rely on subject-orientation or nominative-orientation when they choose the antecedent of *zibun*. Thus, potential sentence (3), repeated here as (9), which includes a nominative object has to be investigated.

(9) Taro$_i$-ga Ziro$_j$-ga zibun$_{i/*j}$-no heya-de onbu-deki-ta.
Taro-Nom Ziro-Nom self-Gen room-in piggyback-can
'Taro$_i$ was able to piggyback Ziro$_j$ in his$_{i/*j}$ room.'

In example (9), *zibun*'s antecedent is the nominative-marked subject *Taro*, but it cannot be the nominative-marked object *Ziro*. Thus, if children follow the subject-orientation of *zibun* in example (9), they take *Taro* as its antecedent in an adult-like way. On the other hand, if they follow nominative-orientation, then they may take either *Taro* or *Ziro* as its antecedent.

3. Experiment

3.1 Experimental design

The purpose of my study is to see whether young children follow subject-orientation or nominative-orientation when they choose *zibun*'s antecedent. In my experiment, I tested potential sentences such as (10) with a nominative object and (11) with an accusative object, in order to make a comparison between sentence (10) and (11).

(10) Baikinman$_{i}$-wa usagi$_{j}$-ga zibun$_{i/*j}$-no niwa-de onbu-dekita.
Baikinman-Top rabbit-Nom self-Gen garden-in piggyback-can
'Baikinman$_{i}$ was able to piggyback the rabbit$_{j}$ in his$_{i/*j}$ garden.'

(11) Baikinman$_{i}$-wa usagi$_{j}$-o zibun$_{i/*j}$-no niwa-de onbu-dekita.
Baikinman-Top rabbit-Acc self-Gen garden-in piggyback-can
'Baikinman$_{i}$ was able to piggyback the rabbit$_{j}$ in his$_{i/*j}$ garden.'

As a prediction, if children follow the subject-orientation property, in both sentences *zibun*'s antecedent is the subject *Baikinman* but not the object *rabbit*. On the other hand, if children follow nominative-orientation, *zibun*'s antecedent is *Baikinman* in sentence (11) because the topic-marked subject *Baikinman* has an abstract nominative-Case, but in sentence (10), the nominative-marked object *rabbit* could also be *zibun*'s antecedent.

In order to compare the potential sentences with nominative objects and those with accusative objects, I divided participants into two groups, a target group tested with nominative object sentences, and a control group tested with accusative object sentences. The participants were 37 monolingual

Japanese-speaking children[2] and 20 adult Japanese native speakers. The information of the two groups is in Table 1.

Table 1: Participants' information

	Children	Children's Age	Adults
The target group	19	4;7-6;6 (mean 5;7)	10
The control group	18	4;7-6;4 (mean 5;7)	10

The task for my experiment was a Picture-Selection Task and whether the correct picture is on the right or the left was counter-balanced. After two practice sentences, each participant was tested with six sentences: two kinds of two controls and two target sentences.

The purpose of the practice was to determine whether the children could understand the experiment procedure, as well as to see whether they took the topic-marked NP as *zibun*'s antecedent. In the practice section, I used sentences such as (12).

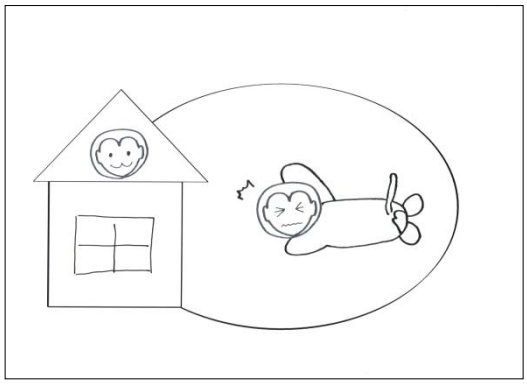
(12) Saru$_{i}$-wa *zibun*$_{i/*j}$-no niwa-de koronda.
monkey-Top self-Gen garden-in fell
'A monkey$_{i}$ fell in his$_{i/*j}$ garden.'

In example (12), the antecedent of *zibun* can be *monkey*, but cannot be other sentence-external characters. The pictures in (13) were used for practice sentence (12). Picture A is the correct picture because the monkey falls in his own garden.

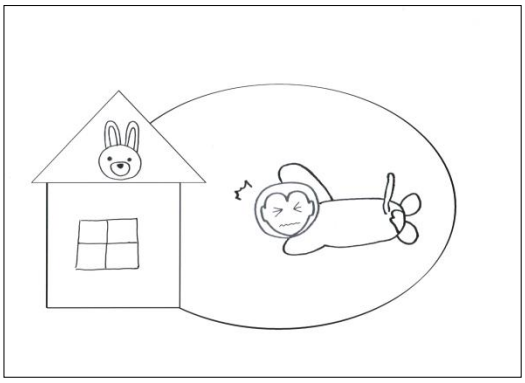
(13) Picture A: The monkey falls in the monkey's garden. (matching)

Picture B: The monkey falls in the rabbit's garden. (mismatching)

Picture A



Picture B



In these practice sentences, all 37 children and 20 adults perfectly chose the correct picture. This showed that they had no problem with the experimental procedure and knew that the topic-marked NP could be the *zibun*'s antecedent.

3.2. Two kinds of the control experiments

As the first control to see whether children correctly understood who the subject and the object were in the test sentences, I examined sentences such as (14) for the target group and (15) for the control group, using the same pictures as shown in (16).

(14) Ampamman-wa usagi-ga onbu-dekita.

Ampamman-Top rabbit-Nom piggyback-can

'Ampamman was able to piggyback the rabbit.'

(15) Ampamman-wa usagi-o onbu-dekita.

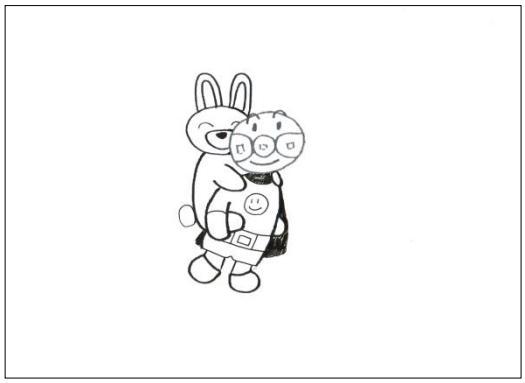
Ampamman-Top rabbit-Acc piggyback-can

'Ampamman was able to piggyback the rabbit.'

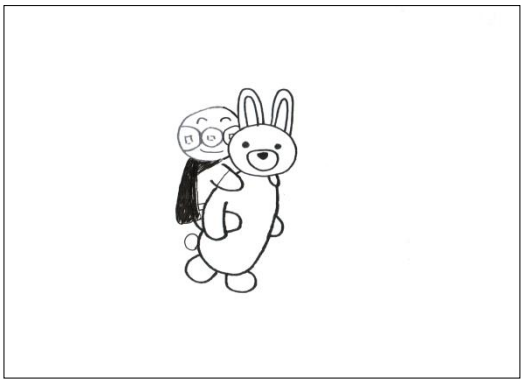
(16) Picture A: Ampamman piggybacks the rabbit. (matching)

Picture B: The rabbit piggybacks Ampamman. (mismatching)

Picture A



Picture B



In (16), the matching picture for both sentences (14) and (15) is Picture A, in which Ampamman piggybacks the rabbit. Conversely, Picture B, in which the rabbit piggybacks Ampamman, mismatches with sentence (14) and (15). However, the sentence in (14) can be understood as an OSV sentence as in (17).

(17) Ampamman-wa$_1$ usagi-ga t_1 onbu-dekita.
Ampamman-Top rabbit-Nom piggyback-can
'Ampamman, the rabbit was able to piggyback.'

In the alternative reading (17), *rabbit* is the subject and *Ampamman* is the topicalized object. Therefore, if the participants in the target group interpret sentence (14) as an OSV sentence (17), they would choose Picture B. In contrast, if the participants understand it as a SOV sentence, they would choose Picture A. The results from the study are given in Table 2.

As can be seen in Table 2, the target group children choose Picture A as the interpretation of sentence (14) at the rate of 84.2 %. The rate is almost the same as the rate for the control group children in choosing Picture A as the interpretation of sentence (15), which cannot be understood as an OSV

sentences. Moreover, even the target group adults choose Picture A at a rate of 100 % in sentence (14).

Table 2: Rates of choosing Picture A for the first control sentences

	Control sentences such as (14) and (15)
The target group children	(14) 84.2% (32/38)
The control group children	(15) 86.1% (31/36)
The target group adults	(14) 100% (20/20)
The control group adults	(15) 100% (20/20)

These results mean that the majority of the children in both groups interpreted sentences (14) and (15) as SOV sentences in an adult-like way. This means that they have no problem in understanding what is the subject and what is the object in the test sentences.

The second control sentences tested interpretation of sentences such as (18) for the target group and (19) for the control group. The purpose was to see whether children had problems in understanding parts other than *zibun* in target sentences.

(18) Poohsan-wa neko-ga neko-no niwa-de onbu-dekita.
Pooh-Top cat-Nom cat-Gen garden-in piggyback-can
'Pooh was able to piggyback the cat in the cat's garden.'

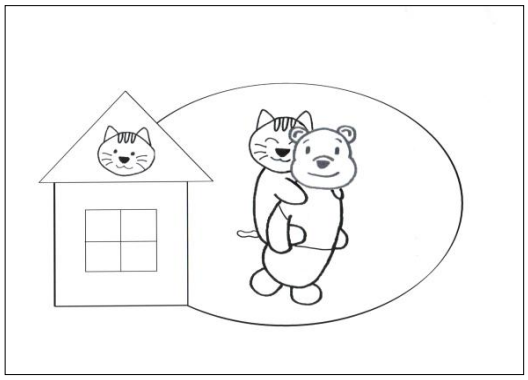
(19) Poohsan-wa neko-o neko-no niwa-de onbu-dekita.
Pooh-Top cat-Acc cat-Gen garden-in piggyback-can
'Pooh was able to piggyback the cat in the cat's garden.'

The pictures as shown in (20) were used for both sentences (18) and (19).

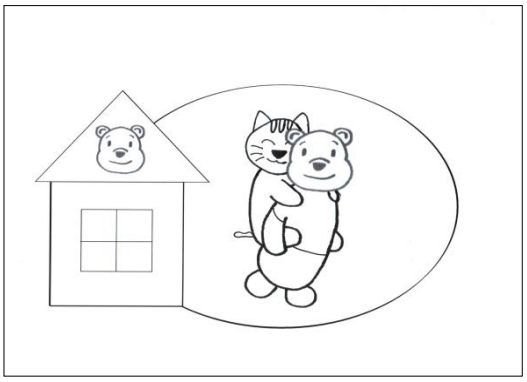
(20) Picture A: Pooh piggybacks the cat in the cat's garden. (matching)

Picture B: Pooh piggybacks the cat in Pooh's garden. (mismatching)

Picture A



Picture B



In sample pictures (20), Picture A matches with sentences (18) and (19) because the place where Pooh piggybacks the cat is not Pooh's garden but the cat's garden. The results of this experiment are given in Table 3.

Table 3: Correct response rates for the second control sentences

	Control sentences such as (18) and (19)
The target group children	(18) 92.1% (35/38)
The control group children	(19) 86.1% (31/36)
The target group adults	(18) 100% (20/20)
The control group adults	(19) 100% (20/20)

As shown in the table above, the responses of the target group children are adult-like at the rate of 92.1% for sentence (18), while those of the control group children are adult-like at 86.1% for sentence (19). Therefore, these children have

no problem in understanding parts other than *zibun* in target sentences.

3.3. Target experiment

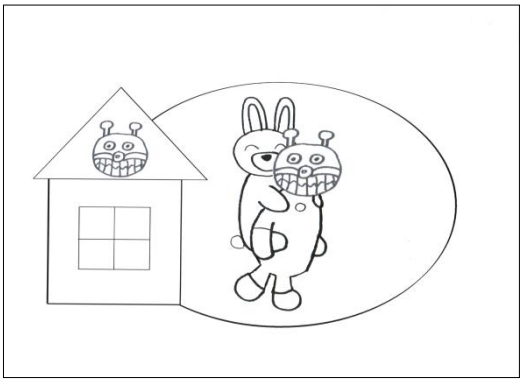
Finally, I conducted the experiment with the two target sentences in each target and control group. First, I present the results of the target sentences for the control group, such as (11), repeated here as (21).

(21) Baikinman$_i$-wa usagi$_j$-o zibun$_{i/*j}$-no niwa-de onbu-dekita.
Baikinman-Top rabbit-Acc self-Gen garden-in piggyback-can
'Baikinman$_i$ was able to piggyback the rabbit$_j$ in his$_{i/*j}$ garden.'

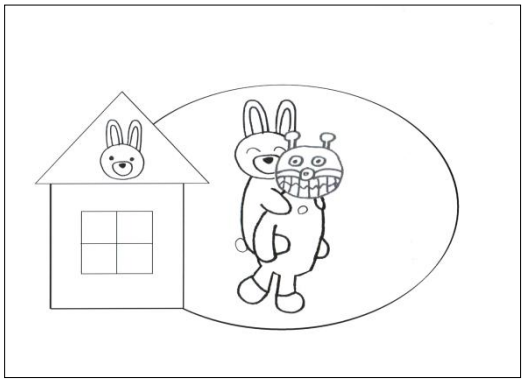
In sentence (21), *zibun*'s antecedent is the subject *Baikinman*, and it cannot be the object *rabbit*. Thus, if as a prediction children have subject-orientation, they will take *Baikinman* as *zibun*'s antecedent correctly. Also, even if children follow nominative-orientation, they will take *Baikinman* as its antecedent because topic-marked subject *Baikinman* has an abstract nominative-Case. The sample pictures used for sentence (21) are given in (22).

(22) Picture A: Baikinman$_i$ piggybacks the rabbit in his$_i$ garden. (matching)
Picture B: Baikinman piggybacks the rabbit$_j$ in his$_j$ garden. (mismatching)

Picture A



Picture B



The correct picture is Picture A for sentence (21) because the place where Baikinman piggybacks the rabbit is Baikinman's garden. The results are shown in Table 4.

Table 4: Target sentence rates of correct responses for the control group

	Target sentences such as (21)
The control group children	(21) 88.4% (32/36)
The control group adults	(21) 100% (20/20)

The control group children gave correct responses at the rate of 88.4% percent as indicated in Table 4. This shows that these children did not take the accusative object as *zibun*'s antecedent. This result is the same as Murasugi and Kawamura's work.

Next, I present the results of the target sentences for the target group, such as (10), repeated here as (23).

(23) Baikinman$_i$-wa usagi$_j$-ga zibun$_{i/*j}$-no niwa-de onbu-dekita.
Baikinman-Top rabbit-Nom self-Gen garden-in piggyback-can
'Baikinman$_i$ was able to piggyback the rabbit$_j$ in his$_{i/*j}$ garden.'

In sentence (23), *zibun*'s antecedent is *Baikinman* but not *rabbit*. If children follow subject-orientation, they will take *Baikinman* as *zibun*'s antecedent in sentence (23). However, if children think that a nominative phrase can be *zibun*'s antecedent (i.e., they follow nominative-orientation), they may take *rabbit* as its antecedent. The pictures used for sentence (23) are the same as those used for (21) as shown in (22). Hence, for sentence (23), the correct

picture is Picture A, in which Baikinman piggybacks the rabbit in Baikinman's garden. The results are given in Table 5.

Table 5: Target sentence rates of correct responses for the target group

	Target sentences such as (23)
The target group children	(23) 68.4% (27/38)
The target group adults	(23) 100% (20/20)

The target group children gave correct responses at a rate of 68.4%, while the control group children, as in Table 4, gave correct responses at a rate of 88.4%. There is a difference between the two groups, although both group's children have almost no difference for the control sentences as shown in Table 2 and Table 3. Moreover, when attention is restricted to the children who selected the correct pictures for all the control sentences, the difference becomes more visible.

The screened children's information is given in Table 6. There are 11 children in the target group, and 10 children in the control group.

Table 6: Screened children's information

	Number	Age
Screened children in the target group	11	4;7-6;3 (mean 5;5)
Screened children in the control group	10	4;11-6;3 (mean 5;9)

Since the screened participants were able to select the correct pictures in all the

control sentences, whether the children's *zibun*-anaphor is subject-oriented or not can be reliably observed. The results for these participants on target sentences such as (23) and (21) are summarized in Table 7.

Table 7: Target sentence rates of correct responses for screened children

	Target sentences like (23) and (21)
The screened children in the target group	(23) 54.5% (12/22)
The screened children in the control group	(21) 90% (18/20)

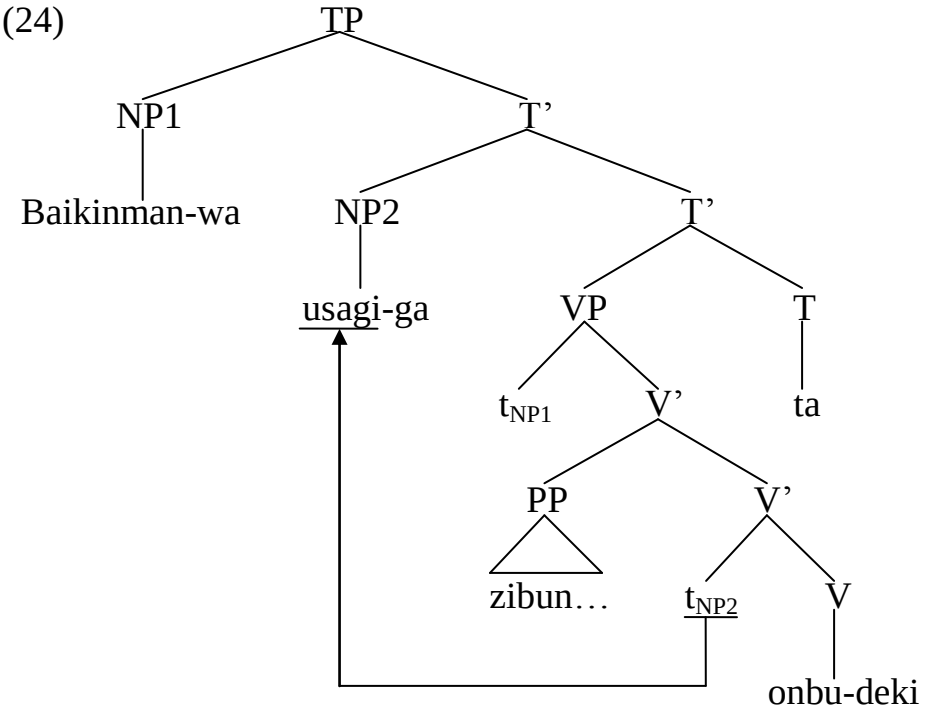
The screened participants in the target group are adult-like at 54.5%, while those in the control group are at 90%. The difference is statistically significant (p=.025) by t-test.[3]

4. Discussion

The result shows that even six-year-old children have difficulty in choosing *zibun*'s antecedent correctly, at least in the case of a potential sentence with a nominative object such as in (23). It seems that it is possible that children's *zibun*-anaphor could be nominative-oriented rather than subject-oriented.

As for the reason for the non-adult-like responses of the target group children in a potential sentence such as (23), one possibility is that the nominative object may be in the Spec of TP in the child's grammar as illustrated in (24), whereas it is the complement of V in the adult's grammar. However, at this point, there is not any independent supporting evidence for this speculation, so it is better to leave the issue for future speculation.

(24)



Notes

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[1] In Murasugi and Kawamura (2005), two out of six four-year-old children are not perfectly adult-like with the test sentences such as (5) and (6), although they are perfectly adult-like in interpreting the control sentences in (7) and (8).

[2] Actually, the participants of the children are forty, but I eliminate three of them because they were not able to understand the experimental procedure.

[3] However, by a Mann-Whitney non-parametric test, the difference is (p=.061), nearly significant. This may be caused by not providing enough data for the non-parametric test.

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