Early Acquisition of Copy & Movement in a Japanese OSV Sentence[*]

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In this paper, I argue that, in early child Japanese, an OSV sentence is derived by movement which leaves a copy, the same as in adult Japanese.

1. Introduction

Otsu (1994) has shown that Japanese-speaking children (aged 3-4) can correctly comprehend OSV sentences in an act-out task (cf. Hayashibe 1975), when the scrambled Object phrase is provided in the previous discourse and it is with a definite marker *sono* 'the/that'.   His sample stimulus sentences are:

(1) Kooen-ni ahiru-san-ga imasita.
park   in duck   Nom is-Polite-Past
'There was a duck in a park.'
Sono ahiru-san-o kame-san-ga osimasita.
the   duck   Acc turtle Nom push-Polite-Past
'The duck, a turtle pushed.'

Thus, an OSV sentence seems to be properly generated in the early grammar of child Japanese.
A further issue in the study of Japanese OSV acquisition is whether children's grammar base-generates an OSV sentence as it is or derives it from an underlying SOV structure by movement, which leaves a copy of the Object phrase in the original position.   I tackle this acquisition issue in this paper and argue that the latter option is correct.   This paper is organized as follows.   In section 2, following Kuroda (1980), I argue for the copy & movement analysis of Japanese OSV sentences in adult syntax.   In section 3, I review a few previous studies which are relevant to our acquisition issue.   In section 4, I report my experiment of L1 Japanese acquisition and argue that the results support the copy & movement analysis of OSV sentences in early child Japanese.   In section 5, some theoretical implications of my finding are discussed.   Section 6 concludes the paper.

2. Adult Syntax of Japanese OSV Sentences

In this section, I argue for the copy & movement analysis for a Japanese OSV sentence in adult syntax, along the line of Kuroda (1980).   His argument is based on the so-called Q(uantifier)-float.   First of all, in adult Japanese syntax, Q-float is possible from adjacent Subject and adjacent Object, as exemplified below.[1, 2]

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[1] The verb *hairu* 'enter' in (2) is unaccusative, and hence the surface Subject is in the Object position in the underlying structure.   However, this does not matter for my purpose, since what I want to show here is the fact that Q-float is possible from the adjacent surface Subject.

[2] Miyagawa(1989) argues that Q-float in Japanese is licensed by mutual c-command requirement, rather than the adjacency requirement.   However, in this paper, I adopt the adjacency requirement as the licensing condition of Q-float, because it simplifies the flow of arguments and also because it is not certain that children license Q-float by the mutual c-command requirement.   The simplification does not detract from the main points of this paper as far as I can see.

(2) Kuma-ga ni-hiki ami-ni haitteru.   (SQAdjunctV)
     bear Nom two net in enter-TEIRU
     "Two bears have entered the net."

(3) Buta-ga kuma-o ni-hiki kosutteru.   (SOQV)
     pig Nom bear Acc two brush-TEIRU
     "A pig is brushing two bears."

A quantifier phrase such as *ni-hiki* 'two' can modify an immediately preceding Subject or Object, as in SQAdjunctV (2) and SOQV (3).[3] The quantifier phrase can alternatively appear inside the phrase of a modified noun, as in *ni-hiki no kuma* 'two bears'. For this reason, for sentences such as (2) and (3), it is informally said that there is "Q-float" from the Subject or Object, respectively.

Interestingly, there is an asymmetry, regarding whether a quantifier phrase can modify a non-adjacent phrase. As Kuroda (1980) points out, Q-float from Object in OSQV is possible, as in (4), but Q-float from Subject in SOQV is impossible, as in (5).[4]

(4) Kuma-o buta-ga ni-hiki kosutteru.   (OSQV)
     bear Acc pig Nom two brush-TEIRU
     "Two bears, a pig is brushing."

(5) Kuma-ga buta-o ni-hiki kosutteru.   (SOQV)
     bear Nom pig Acc two brush-TEIRU
     * "Two bears are brushing a pig."
     (ok "A bear is brushing two pigs.")

Kuroda (1980) argues that this asymmetry is unexpected under the base-generation analysis of OSV sentences. If an OSV sentence and an SOV sentence were both base-generated in their surface orders, as long as Q-float from Object in OSQV is possible, Q-float from Subject in SOQV should be possible as well. Kuroda (1980) claims that this asymmetry can be properly explained if an OSV sentence is derived by movement of the Object phrase from the underlying SOV structure.

Here I attempt to explain the contrast between (4) and (5) by rephrasing Kuroda's insight within the more recent theory of scrambling. If we adopt the theory of Saito (2003), when the Object phrase in an OSV sentence is derived by movement from its underlying SOV structure, the moved Object phrase in an OSV sentence leaves a copy in its original position. Thus, the underlying structure of an OSQV sentence is SOQV, and in the surface structure of an OSQV sentence, there is a copy of the moved Object phrase in the take-off site, which is adjacent to the Q. In other words, the derived surface structure of an OSQV sentence is OiS(Oi)QV, where (Oi) is the copy of the moved Object phrase. Then, Q-float from the Object phrase in an OSQV sentence is not an exception to the adjacency requirement anymore, if we reasonably extend the adjacency requirement as in (6).

(6) Q-float from a phrase X is possible if Q and X or its copy are adjacent to each other.

Assuming (6), we can explain the Q-float asymmetry in the following way. Q-float from the Object phrase in an OSQV sentence is possible because the derived surface structure of the sentence is OiS(Oi)QV and Q is adjacent to the copy of the Object phrase. In contrast, Q-float from the Subject phrase in an SOQV sentence is impossible because it involves no movement and the Subject phrase and Q are not adjacent in the surface or underlying structure.[5]

In this way, following Kuroda (1980), I argue that an OSV sentence in adult Japanese is derived from the underlying SOV counterpart by movement of the Object phrase, which leaves a copy of it in its

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[3] In Japanese, a bare nominal can be either singular or plural.

[4] For more recent discussions of this kind of contrast, see Ishii (1999), for example.

[5] Here I put aside the possibility of VP-internal Subject. Even if the VP-internal Subject is assumed, the fact that Q-float is impossible from S in SOQV suggests that the copy of S is not adjacent to Q in SOQV.

original position.

3. Our Acquisition Issue and Relevant Previous Studies

Here is our acquisition issue in this paper: can we apply Kuroda's argument to early stages of children's acquisition of Japanese OSV? In other words, do young children allow Q-float from O in OSQV, while disallowing Q-float from S in SOQV? By investigating this research question, I will argue that, in early child Japanese, an OSV sentence is derived by movement which leaves a copy, like in adult Japanese. Before presenting my own experimental study, I would like to review a few previous studies which are relevant to our issue.

3.1. Suzuki & Yoshinaga (2004)

Suzuki & Yoshinaga (2004) is an earlier experimental study which addresses our acquisition issue. Although their goal is not exactly the same as ours, the test items they used are essentially the same as the ones discussed in this paper. They examined whether children can properly comprehend OSAdjunctQV sentences and SAdjunctOQV sentence. If we ignore the Adjunct phrase in them, their test items are the ones under our discussion: OSQV and SOQV.
Samples of their test sentences are given below.

(7) a.   Hebi-o inu-ga maeasi-de ni-hiki tatakimasita.   (OSAdjunctQV)
           snake Acc dog Nom forepaw with two hit
           "Two snakes, a dog hit with its forepaw."
    b.   Inu-ga maeasi-de hebi-o ni-hiki tatakimasita.   (SAdjunctOQV)
           dog Nom forepaw with snake Acc two hit
           "A dog hit two snakes with its forepaw."

Their method is picture-selection. For sentences such as (7), children were asked to select one picture between Picture A (a dog hitting two snakes with its forepaw) and Picture B (two dogs hitting a snake with its forepaw). Picture A is correct for both of (7a) and (7b). There are 6 tokens for each of OSAdjunctQV sentences and SAdjunctOQV.
There are 33 subjects in their experiment, aged 4;2-6;11 (mean 5;6). Although 5- and 6-year-olds performed correctly more than 90% of the time, the 4-year-olds (N=10) performed quite poorly for OSAdjunctQV; the correct performance was only 68.3% of the time. This might mean that children at an early stage utilize base-generation in generating OSV sentences.
However, when Suzuki and Yoshinaga provided stimulus sentences, there was no discourse context or the definite marker *sono* 'the/that', unlike the experiment in Otsu (1994) (see section 1). This might have imposed an extra burden on the young children in carrying out the task with OSV-type sentences. It is possible that we will obtain better results if we eliminate this extra burden. Following this reasoning, my own experiment, which will be presented in section 4, incorporates the style of Otsu (1994)'s experiment; it involves discourse context and the definite marker *sono* 'the/that'.
Also, Suzuki & Yoshinaga's method is picture-selection. As is well-known, when a child chooses Picture A in a selection task between Picture A and Picture B, it might just mean the child preferred Picture A; it does not necessarily mean that the child **rejects** Picture B for the meaning of the stimulus sentence. Thus, to avoid underestimation of children's competence, I use a different method (i.e., the truth value judgment task) in my own experiment, as I will mention in section 4.

3.2. Murasugi & Kawamura (2005)

Murasugi & Kawamura (2005) also addresses our acquisition issue with a different type of construction. They examined whether children can correctly act out sentences such as (8).

(8) a.   Ahiru-ga$_1$ usi-o   [zibun-no$_1$ niwa-de] oikaketa.   (SOLocV)
              duck Nom cow Acc   self Gen   garden at   chased
              'The duck chased the cow at the garden of himself.'

      b.   Usi-o$_1$ [zibun-no$_2$ niwa-de]$_3$ ahiru-ga$_2$ t_1 t_3 oikaketa.   (OLocSV)
              cow Acc   self Gen garden at   duck Nom   chased
              '(The cow, at the garden of himself, the duck chased.)'

In both (8a) and (8b), the antecedent of an anaphor *zibun* 'self' must be the subject, *ahiru* 'duck'. Murasugi & Kawamura report that even 3-year-old children acted out sentences such as (8a) and (8b) correctly, as long as they were able to correctly act out simple SOV/OSV sentences without the locative phrase (Loc), *zibun-no niwa-de* 'at the garden of himself'. Based on this, they claim that they have shown that even 3-year-old children have knowledge of reconstruction of moved phrases. Their claim implies that an OSV sentence at age 3 is derived from the underlying SOV counterpart by movement of the Object phrase, which leaves a copy of it in its original position. Thus, Murasugi & Kawamura (2005) addresses our acquisition issue and provide an answer.

However, their experimental result can be explained if their children had known that the antecedent of a Japanese anaphor *zibun* must be a subject (i.e., so-called subject-orientation of *zibun*). Otsu (1997) reports that Japanese-speaking children aged 3-5 seem to have acquired the subject-orientation of *zibun*. Given the subject-orientation of *zibun*, one can properly choose the antecedent of *zibun* in (8b) (and in (8a)) without conducting reconstruction of moved phrases. Thus, Murasugi & Kawamura's result does not necessarily mean that there is movement and reconstruction (or copy & movement) in the grammar of early child Japanese. For this reason, it seems that further investigation is necessary to give a definite answer to our acquisition issue concerning Japanese-speaking children's OSV sentences.

4. Experiment

In this section, I report on my experiment focusing on our acquisition issue. The experimental subjects are 11 4-year-olds (mean age: 4;6) and 14 5-year-olds (mean age: 5;6). They are all Japanese-speaking monolinguals in the Tokyo area. Each subject was interviewed individually in a quiet room.

The method of the experiment is the truth value judgment task (Crain & Thornton 1998). There are two experimenters in each experimental session. One experimenter acts out a scenario with toys and props. The other experimenter, who plays the role of a puppet (Wan-chan), describes the acted-out situation with a stimulus sentence. An experimental subject gives Wan-chan an ice cream cone if (s)he thinks the puppet's description of the situation is right (i.e., acceptance), and (s)he gives Wan-chan a broccoli if (s)he thinks the puppet's description is wrong (i.e., rejection). Half of the stimulus sentences were presented with a matching situation and the other half were presented with a mismatching situation. The experimental subject is supposed to accept the stimulus sentences for the matching condition and reject the ones for the mismatching condition.

As mentioned earlier, my experiment adopts the style of Otsu (1994). When a stimulus sentence is presented, there is a lead-in sentence which introduces a "topic phrase" in the discourse, and a definite marker *sono* 'the/that' is attached to the "topic phrase" in the target stimulus sentence, following Otsu (1994)'s sample in (1).[6]

In the first part of my experiment, I examined whether the experimental subjects properly understand Japanese SOV/OSV sentences. Each stimulus sentence was presented after a lead-in sentence such as (9). Sample stimulus sentences are given in (10).[7]

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[6] Here, the "topic phrase" just means the NP introduced in the lead-in sentence. It becomes "old information" in the second target stimulus sentence. As long as it is the "old information" in the target stimulus sentence, we call it a "topic phrase" even when it does not occur with the topic marker *-wa*.

[7] There are four bears in the situation for (9), for example.

(9) Kooen-ni kuma-ga kita yo.   (**Lead-in**)
   park to bear Nom came
   "Bears came to a park"

(10) a.   Sono kuma-ga buta-o kosutteru yo.   (*sono***SOV**)
        the bear Nom pig Acc brush-TEIRU
        "The bears are brushing a pig."

   b.   Sono kuma-o buta-ga kosutteru yo.   (*sono***OSV**)
        the bear Acc pig Nom brush-TEIRU
        "The bears, a pig is brushing."

Under the mismatching condition, a *sono*SOV sentence is given for the *sono*OSV situation, and a *sono*OSV sentence is given for the *sono*SOV situation.
   The result of this first part is overall very good, as shown by the scores in Table 1

Table 1: Correct Response Rates of SOV/OSV:

	*sono*S O V		*sono*O S V	
	Match (Acceptance)	Mismatch (Rejection)	Match (Acceptance)	Mismatch (Rejection)
4-year-olds	100% (22/22)	81.8% (18/22)	100% (22/22)	90.9% (20/22)
5-year-olds	100% (28/28)	96.4% (27/28)	96.4% (27/28)	96.4% (27/28)

Thus, in our truth value judgment task, the experimental subjects properly comprehended both SOV and OSV sentences, given the discourse context and the definite marker *sono* on the topic phrase.
   Next, I would like to show that my experimental subjects correctly allow Q-float from an adjacent Subject/Object phrase.   Here again, each stimulus sentence was presented after a lead-in sentence such as (9).   Sample stimulus sentences are given in (11).

(11) a.   Sono kuma-ga ni-hiki ami-ni haitteru yo.   (**Q-float from S in *sono*SQAdjunct V**)
        the   bear Nom two net in enter-TEIRU
        "Two of the bears have entered the net."

   b.   Buta-ga sono kuma-o ni-hiki kosutteru yo.   (**Q-float from O in S*sono*OQV**)
        pig Nom the bear Acc two brush-TEIRU
        "A pig is brushing two of the bears."

Under the mismatch condition, Q is "two", but there is only one S/O (e.g., 'one bear' for (11a) and (11b)) in the situation, and the children are supposed to reject them.
   The result of this second part is also very good, as shown in scores in Table 2.

Table 2: Correct Response Rates of Q-float from adjacent S/O:

	*sono*S Q Adjunct V		S *sono*O Q V	
	Q-float from S: Match (Acceptance)	Q-float from S: Mismatch (Rejection)	Q-float from O: Match (Acceptance)	Q-float from O: Mismatch (Rejection)
4-year-olds	100% (22/22)	100% (22/22)	100% (22/22)	90.9% (20/22)
5-year-olds	100% (28/28)	100% (28/28)	96.4% (27/28)	100% (28/28)

Thus, the experimental subjects correctly allow Q-float from an adjacent Subject/Object phrase, just like adults.

Now that it has been shown that our experimental subjects can successfully comprehend SOV/OSV sentences and correctly allow Q-float from an adjacent Subject/Object phrase, we are ready to investigate the children's knowledge of Q-float with SOV/OSV sentences.

I examined whether the experimental subjects properly allow Q-float from Object in OSQV sentences while disallowing Q-float from Subject in SOQV sentences. Once again, each stimulus sentence was presented after a lead-in sentence such as (9). Sample stimulus sentences are given in (12).

(12) a.　　Sono kuma-ga buta-o ni-hiki kosutteru yo.　(**Q-float from S in SOQV: impossible**)
　　　　　the bear Nom pig Acc two brush-TEIRU
　　　　　* "Two of the bears are brushing a pig."
　　　　　(ok"The bears are brushing two pigs.")

　　 b.　　Sono kuma-o buta-ga ni-hiki kosutteru yo.　(**Q-float from O in OSQV: possible**)
　　　　　the bear Acc pig Nom two brush-TEIRU
　　　　　"Two of the bears, a pig is brushing."

Sentences such as (12a) were given for mismatching situations (e.g., (12a) for a situation where two of the bears are brushing a pig), and sentences such as (12b) were given for matching situations (e.g., (12b) for a situation where a pig is brushing two of the bears). Children will reject the former and accept the latter, if they are adult-like.

The result of this final part is shown in Table 3.

Table 3: Correct Response Rates of Q-float from non-adjacent S/O:

	*sono*S O Q V	*sono*O S Q V
	Q-float from S: Ungrammatical (Rejection)	Q-float from O: Grammatical (Acceptance)
4-year-olds	100% (22/22)	81.8% (18/22)
5-year-olds	96.4% (27/28)	89.2% (25/28)

As shown in the table above, the experimental subjects' performance is adult-like more than 80% of the time. They correctly rejected Q-float from Subject in SOQV sentences more than 90% of the time and correctly allowed Q-float from Object in OSQV sentences more than 80% of the time.

Thus, I have shown that Kuroda's line of argument for the copy & movement analysis can be applied to 4/5-year-old Japanese speaking children. Specifically, 4/5-year-old Japanese children, who can properly understand SOV/OSV sentences and correctly allow Q-float from adjacent Subject/Object, are shown to mostly accept Q-float from Object in OSQV sentences, while mostly rejecting Q-float from

Subject in SOQV sentences.   This asymmetry in Q-float from non-adjacent Subject/Object is unexpected under the base-generation approach of SOV/OSV sentences, as argued by Kuroda (1980) (see section 2). Therefore, I argue that our experimental results support the copy & movement analysis of OSV sentences in early child Japanese.

5. Theoretical Implications

In this section, I would like to discuss some theoretical implications of my finding.   First, regarding the derivation of OSV sentences, I have shown that early child Japanese is essentially the same as adult Japanese; they both derive OSV sentences from the underlying SOV structure via copy & movement of the Object phrase.   This means that the Continuity Hypothesis of grammatical competence (Pinker 1984, Crain & Wexler 2000) is supported for the derivation of Japanese OSV sentences.   In other words, it has been shown that no maturational change (Borer & Wexler 1987, etc.) is involved in the acquisition of the derivation of Japanese OSV sentences.

Second, I have shown that there is evidence for claiming that movement of the Object phrase in an OSV sentence leaves a copy (or a trace) in the original position in early child Japanese.   For the acquisition of English wh-movement, Crain & Thornton (1998) demonstrated, by investigating so-called *wanna*-contraction, that a trace is left in the original position in early child English.   My finding replicates the finding of Crain & Thornton (1998) in a different language (i.e., early child Japanese) with a different type of movement (i.e., scrambling).

Third, the asymmetry I reported regarding the availability of Q-float from non-adjacent phrases leads us to claim that Q-float is **not** licensed by linear order in early child Japanese, as in adult Japanese (see Suzuki & Yoshinaga 2004 for a claim along the same line).

Finally, early acquisition of the underlying SOV order in Japanese, which I have shown, seems to be a case of Very Early Parameter Setting (VEPS) in Wexler (1998).

6. Conclusion

In sum, I have claimed that an OSV sentence in early child Japanese is derived by movement which leaves a copy.   My claim is based on the observation that 4/5-year-olds exhibit an asymmetry in non-adjacent Q-float licensing in SOQV and OSQV sentences.   Since the youngest children in my experiment are 4-year-olds, one might ask about the grammar of 2/3-year-olds.   I speculate that children adopt the copy & movement analysis of an OSV sentence from the beginning of their acquisition of such type of sentences.   However, to demonstrate that children indeed utilize the copy & movement operation, they must be old enough to handle Q-float in OSV/SOV sentences.   In other words, it is not easy to examine our issue with children who are not old enough to handle relevant stimulus sentences of Q-float. Thus, the examination of 2/3-year-olds' grammatical operations of OSV sentences is an open issue left for further investigation.

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