What Children See Is Not What They Get*

YOSHIKI FUJIWARA  
*University of Connecticut  
HIROYUKI SHIMADA  
Hokuriku University

1 Introduction
This study reinvestigates the acquisition of ellipsis in Japanese and pursues the nature of the ellipsis site in child grammar. In the literature on ellipsis, the following questions have been mainly studied (Aelbrecht 2015; Merchant 2019):

(1) a. Structure Question:  
Is there syntactic structure that is unpronounced in the ellipsis site?

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b. Identity Question:
What is the relationship between the missing element and its antecedent?
c. Licensing Question:
What are the licensing conditions on missing materials?

We focus on the structure question in this paper. Pursuing it in first language acquisition sheds light on whether children’s syntax allows unpronounced structures or not. If the answer to the structure question in (1) is negative and a non-structural approach is taken (i.e. no deleted parts, no null elements), children’s grammar may represent what we could call WYSIWYG, ‘what you see is what you get’. In constrast, if the answer is positive and children take the structural approach, their grammar must permit unpronounced syntactic structures.

In this paper, we address this question by studying null-object sentences in Japanese like (2).

(2) *Tama-wa mizu-o nameteiru.* *Pochi-mo ____ namateiru.*

Tama-TOP water-ACC is.licking Pochi-also is.licking

lit. ‘Tama is licking water. Pochi is also licking ____.’

The object in the second sentence in (2) is missing. Under the structural approach, the object is syntactically active and becomes unpronounced by deletion (i.e. ellipsis of arguments), as in (3).¹

(3) Structural approach

```
TP
  /\  
Subj  T'
     /\ 
    VP  T
      /\ 
     Obj V
```

Thus, under this structure, (2) means that both Tama and Pochi are licking water. It has been argued that this structure is in fact possible in Japanese, and ellipsis applied here is known as argument ellipsis (Oku 1998; Saito 2007, among others; cf. Otani and Whitman 1991).

¹ Another kind of structural approach is to posit a phonologically null lexical element in the ellipsis site such as *pro* (Kuroda 1965; cf. Hoji 1998). We’ll discuss this issue in Section 4.
In contrast, there is no position for the object in the structure under the WYSIWYG approach. Thus, the underlying structure of (2) should be the following:

\[(4)\text{ WYSIWYG approach}\]

\[
\begin{array}{c}
\text{TP} \\
\text{Subj} \quad T' \\
\text{VP} \quad T \\
\text{V}
\end{array}
\]

Note that this structure corresponds to a structure of intransitive verbs. In Japanese, most of transitive verbs can be intransitivised. For example, (2) is truth-conditionally true as long as Tama is licking water and Pochi’s licking event is going on. Thus, both structures are permitted in Japanese.

The goal of this paper is to see whether child grammar can permit abstract and invisible structures as in (3) or not. However, note that the ellipsis interpretation of (2) derived under (3) is entailed by the intransitive interpretation derived under (4). In other words, ‘Pochi is licking water’ is true if ‘Pochi is licking something’ is also true. There are some ways to avoid this ‘intransitive entailment’. One way is to use a quantifier (Takahashi 2008).

\[(5)\text{ Kuma-san-wa san-ko-no booru-o ket-ta yo.}\]

\[
\begin{array}{c}
\text{bear-Mr.-TOP three-CL-GEN ball-ACC kick-PAST PRT}
\end{array}
\]

‘The bear kicked three balls.’

\[
\text{Kitune-san-mo } \underline{\text{ket-ta}} \text{ yo.}
\]

\[
\begin{array}{c}
\text{fox-Mr.-also kick-PAST PRT}
\end{array}
\]

lit. ‘The fox also kicked ___.’

(Okta 2014: 157)

Intransitive (WYSIWYG): ‘The fox’s kicking event happened.’

Ellipsis (structural): ‘The fox also kicked three balls.’

In (5), the intransitive reading does not entail the ellipsis reading. Suppose that the fox kicked two balls. In this situation, (5) is true under the intransitive reading but not under the ellipsis reading. Another way to avoid the intransitive entailment is to use an anaphor zibun under negation (Saito 2007).

\[(6)\text{ Sensei-wa subete-no ichinensei-ni zibun-no booru-o keraseta.}\]

\[
\begin{array}{c}
\text{teacher-TOP all-GEN first-grader-DAT self-GEN ball-ACC kick.made}
\end{array}
\]

‘The teacher let all first-graders kick their own balls.’
But ‘he did not let the second-graders kick __.’ (Saito 2007, 207)

Itransitive: ‘But he did not let the second-graders kick anything.’

Ellipsis: ‘But he did not let the second-graders kick their own ball.’

Again, the intransitive reading does not entail the ellipsis reading in (6). Therefore, ellipsis readings can tell us whether children allow abstract structures as in (3). If they can access ellipsis readings, their grammar must permit abstract structures. If they cannot, children’s grammar may represent WYSIWYG.

The organization of this paper is as follows: In Section 2, we review previous studies on the acquisition of ellipsis by Japanese children. Although some studies have already reported that Japanese children can access ellipsis interpretations, we point out an alternative explanation for their data: the parallelism strategy. Section 3 presents our experiment, which shows that Japanese children around age 5 permit an abstract syntactic structure. In Section 4, we compare one type of the structure approach to another and consider the further implications of our findings.

2 Previous Studies

Many studies have investigated the acquisition of ellipsis in Japanese (Fujiwara 2017; Fujiwara and Shimada 2019; Matsuo 2007; Otaki and Yusa 2009, 2012; Otaki 2014; Sugisaki 2007, 2009, 2012, 2013a, 2013b, 2018), and most of them have investigated whether Japanese children can access ellipsis readings in sentences containing null arguments. Table 1 summarizes the results of their studies.

<table>
<thead>
<tr>
<th>Previous studies</th>
<th>Age</th>
<th>Ellipsis?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugisaki (2007)</td>
<td>3;1-5;4 / M 4;5</td>
<td>Yes</td>
</tr>
<tr>
<td>Matsuo (2007)</td>
<td>3;7-6;11 / M 5;4</td>
<td>Yes</td>
</tr>
<tr>
<td>Otaki &amp; Yusa (2009)</td>
<td>4;4-5;11 / M 5;3</td>
<td>No</td>
</tr>
<tr>
<td>Otaki &amp; Yusa (2012)</td>
<td>4;3-6;2 / M 5;2</td>
<td>Yes</td>
</tr>
<tr>
<td>Sugisaki (2009, 2013)</td>
<td>4;11-6;7 / M 5;10</td>
<td>Yes</td>
</tr>
<tr>
<td>Sugisaki (2018)</td>
<td>3;10-4;7 / M 4;4</td>
<td>Yes</td>
</tr>
<tr>
<td>Fujiwara &amp; Shimada (2019)</td>
<td>5;3-5;11 / M 5;8</td>
<td>No</td>
</tr>
</tbody>
</table>

Table 1: Summary of child’s age and the results of previous studies

Although some studies have reported that Japanese children around age 4 to 5 can access ellipsis readings, we point out an alternative explanation for their
data: the parallelism strategy. To clarify this point, let's consider Otaki and Yusa's (2012) study.

    bear-Mr.-TOP three-CL-GEN ball-ACC kick-PAST PRT
    ‘The bear kicked three balls.’
b. *Kitsune-san-mo __________________ ket-ta yo.*
    Fox-Mr.-also kick-PAST PRT
    lit. ‘The fox also kicked ___.’ (Otaki and Yusa 2012, 227)
    Intransitive: ‘The fox also kicked something.’
    Ellipsis: ‘The fox also kicked (a new set of) three balls.’

They tested sentences like (7b) with a Truth Value Judgment task (Crain and McKee 1985) to see if children can access the ellipsis reading, and found that the children accessed the ellipsis reading in (7) like adults. Notice that -mo ‘also/too’ is attached to the subject in (7b). It has been argued that this element principally imposes the maximal parallelism between the sentence with -mo and its preceding sentence (Funakoshi 2014). We suspect that the children in their experiment might have interpreted (7b) with this parallelism property and without using ellipsis. In fact, the same reading can be obtained with this property irrespective of ellipsis. The preferred interpretation of (8), following (7a), corresponds to the ellipsis reading ‘the fox also kicked three balls.’

(8) *Kitsune-san-mo.*
    fox-Mr.-also
    ‘The fox, too.’

This suggests that as soon as they interpret the parallelism property of -mo in (7b), children can correctly access the ellipsis reading even if they ignore the rest of the sentence. This is what we call the parallelism strategy. Since -mo is also contained in the target sentences of Matsuo’s (2007) and Sugisaki’s (2007, 2009, 2013) experiments, the parallelism strategy may have been at work in their experiments, too. Thus, to make sure that the parallelism strategy cannot be used, we have to avoid using -mo in target sentences. Also, it is better if we can ensure that children listen to the whole sentences.

On the other hand, Sugisaki (2018) tested sentences like (9), which do not contain -mo, with a Truth Value Judgment task.

(9) *Anpanman-wa zyoozuni zibun-no wantyan-o tobikoeta*  
    Anpanman-TOP successfully self-GEN puppy.dog-ACC jumped.over
    ‘Anpanman successfully jumped over his own dog.’
Note, however, that this sentence does not exclude the intransitive entailment discussed in Section 1. (9) is truth-conditionally true as long as Miffy stepped on something. Thus, this sentence does not tell us whether children’s syntax is abstract or WYSIWYG.

Table 2 summarizes the possibilities of the parallelism strategy and the intransitive entailment in the previous studies.

<table>
<thead>
<tr>
<th>Previous studies</th>
<th>Ellipsis?</th>
<th>Parallelism strategy</th>
<th>Intransitive entailment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugisaki (2007)</td>
<td>Yes</td>
<td>✓</td>
<td>✓</td>
</tr>
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<td>Matsuo (2007)</td>
<td>Yes</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Otaki &amp; Yusa (2009)</td>
<td>No</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>Otaki &amp; Yusa (2012)</td>
<td>Yes</td>
<td>✓</td>
<td>×</td>
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<td>✓</td>
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<tr>
<td>Fujiwara &amp; Shimada (2019)</td>
<td>No</td>
<td>×</td>
<td>×</td>
</tr>
</tbody>
</table>

Table 2: Summary of the possibilities of the parallelism strategy and the intransitive entailment in the previous studies

Note that none of the previous studies have succeeded in excluding both possibilities except Otaki and Yusa (2009) and Fujiwara and Shimada (2019), which have reported that children fail to access ellipsis readings. Hence, further investigation is necessary in order to see whether children’s syntax is abstract or WYSIWYG.
3 Experiment

In order to avoid the possibilities of the parallelism strategy and the intransitive entailment, we tested sentences with a topic-marked subject and quantificational object, as in (10).

(10) a. Usagi-wa mit-tsū no ringo-o tabeta kana?
    rabbit-TOP 3-CL-GEN apple-ACC ate Q
    ‘Did the rabbit eat three apples?’

b. Usagi-wa ___________ tabeta yo.
    lit. ‘The rabbit ate ___.’
    Intransitive: ‘The rabbit ate something.’
    Ellipsis: ‘The rabbit ate three apples.’

c. Usagi-wa ___________ tabenakatta yo.
    lit. ‘The rabbit didn’t eat ___.’
    Intransitive: ‘The rabbit did not eat anything.’
    Ellipsis: ‘The rabbit did not eat three apples.’

(10a) is an antecedent clause of (10b) and (10c), whose object is missing. Notice that the subject of (10b) and (10c) is not marked with -mo ‘also/too’ so that the parallelism strategy would not be at work here. Also, testing both affirmative and negative sentences enable us to make sure that children pay attention to the whole sentences. If children judge the sentences without listening to them until the end, their judgments of (10b) and (10c) would be the same. Hence, testing both affirmative and negative sentences enables us to exclude ‘hasty’ children from the analysis. Note also that the intransitive readings in (10b) and (10c) do not entail the ellipsis readings.

The method of this experiment was a Truth Value Judgment task with question-answer pairs. In this method, a puppet was asked a question like (10a) after a story, and participants were asked to judge whether the puppet’s answer such as (10b) and (10c) matched the story. A sample story for (10) is given in (11).

(11) Story: A monkey eats three apples. A rabbit also tries to eat three apples, but he eats only two because he becomes full.

In this story, (10b) is false under the ellipsis reading and true under the intransitive reading. On the other hand, (10c) is true under the ellipsis reading and false under the intransitive reading. There were three items like (10b) and three items like (10c). The verbs we used were taberu ‘eat’, kau ‘buy’, and hakobu ‘carry’.
Thirteen adults and 23 children (age 4;11-6;4, Mean 5;7) participated. We excluded three children from the analysis because they gave the same answers to both (10b) and (10c) five times or more out of six, which suggested that they ignored the latter part of the sentences.

If children’s grammar is WYSIWYG (i.e. the nonstructural approach), they should access the intransitive readings in (10b, c). In contrast, if their grammar permits unpronounced syntactic structures, their access to the ellipsis readings is expected. The result of the experiment is summarized in Table 3.

<table>
<thead>
<tr>
<th></th>
<th>Ellipsis</th>
<th>Intransitive</th>
<th>Children</th>
<th>Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Affirmative (10b)</strong></td>
<td>Reject</td>
<td>Accept</td>
<td>88.3% rejection</td>
<td>100% rejection</td>
</tr>
<tr>
<td><strong>Negative (10c)</strong></td>
<td>Accept</td>
<td>Reject</td>
<td>90% acceptance</td>
<td>100% acceptance</td>
</tr>
</tbody>
</table>

Table 3: Result of our experiment

As in Table 3, the children mostly rejected (10b) and accepted (10c). The adults completely rejected (10b) and accepted (10c). Thus, the children accessed the ellipsis readings like adults. This suggests that children’s grammar permits unpronounced syntactic structures; their grammar is not WYSIWYG.

4 Discussion: Ellipsis vs pro

The result of our experiment shows that Japanese children permit an unpronounced syntactic object in their grammar. This section discusses its nature in more detail. It has been argued that Japanese has at least two ways to derive null arguments. One way is to apply deletion to a relevant item, which we have assumed throughout the paper. This is known as ellipsis (Otani and Whitman 1991; cf. Oku 1998).

The other way is to put a phonologically null lexical item in a relevant position throughout the syntactic computation. This is known as a null pronoun pro in Japanese (Kuroda 1965; cf. Hoji 1998). Note that positing pro is also a structural approach since it supposes an unpronounced syntactic structure in the ellipsis site. It has been widely assumed that both deletion and pro are allowed in Japanese grammar, and they provide different interpretations (Takahashi 2007).

We do not discuss the LF-copy approach to ellipsis, which is another type of structural approach (Oku 1998; Saito 2007; Sakamoto 2017). It assumes that a missing element is not present in overt syntax, and it is copied onto a relevant position at LF from a linguistic antecedent. Our study cannot tell whether Japanese children apply deletion and/or LF-copy to ellipsis. We leave this issue for future research.
2008b). Under the deletion analysis, a missing element is interpreted in the same way as its overt counterpart in the antecedent clause, while the pro analysis supposes that a missing element is a definite pronoun (Kuroda 1965) or indefinite noun (Hoji 1998). It has been argued that an interpretation derived by deletion is different from one with pro (see Otaki 2014). This can be confirmed even in our target sentences by seeing their overt counterparts of the definite and indefinite pro analyses. In (12), an overt pronoun occupies the object position, while in (13), an indefinite overt noun appears as an object.

(12) a. Usagi-wa sore-ra-o tabeta yo. (cf. 10b)
   rabbit-TOP it-PL-ACC ate PRT
   ‘The rabbit ate them.’

   b. Usagi-wa sore-ra-o tabenakatta yo. (cf. 10c)
   rabbit-TOP it-PL-ACC did.not.eat PRT
   ‘The rabbit didn’t eat them.’

(13) a. Usagi-wa ringo-o tabeta yo. (cf. 10b)
   rabbit-TOP apple-ACC ate PRT
   ‘The rabbit ate apples.’

   b. Usagi-wa ringo-o tabenakatta yo. (cf. 10c)
   rabbit-TOP apple-ACC did.not.eat PRT
   ‘The rabbit didn’t eat apples.’

Both (12a) and (13a) are true in the situation we used in our experiment (i.e. 11), while both (12b) and (13b) are false in the same situation. Remember that these truth values are opposite to the truth values we get under the ellipsis readings in (10), and that the children accessed the ellipsis readings. This suggests that they derived abstract syntactic structures by syntactic operation deletion rather than postulating phonologically null lexical items such as pro. In other words, children favored the deletion approach over any other approaches that derive null-object sentences such as the non-structural approach and the (in)definite pro approaches.

The question that arises here is why children favor the deletion approach. Furthermore, why doesn’t Universal Grammar just let children use null lexical elements? We argue that this is because child grammar is constructed to be economical. There are many kinds of ellipsis across the languages. Japanese has a great variety of ellipsis phenomena such as argument ellipsis, V-stranding VP-ellipsis, sluicing, N’-ellipsis, fragment answer, and particle stranding ellipsis. Obviously, positing different types of null elements in each ellipsis case requires a lot of pragmatic inferences and is too costly. On the other hand, the deletion approach reuses syntax, LF-semantics, and probably PF-representation of a linguistic antecedent. In this sense, the deletion strategy is more economical than the pro strategy. Roeper (2019) also argues
that the grammar is easier to use than pragmatic inferences, and the acquisition path follows the principle below:

(14) Minimization Goal:

Minimize pragmatic inference and maximize the information determined by grammar. (Roep 2019, 278)

Hence, the acquisition of deletion is a desirable result: deletion is required to minimize pragmatic inferences. The attested preference for the ellipsis readings to other readings in our experiment is expected under the idea here.

References


