Acquisition of Ellipsis: Phonology or Syntax?

Yoshiki Fujiwara and Hiroyuki Shimada

1. Introduction

This paper concerns the nature of ellipsis in child language. We investigate a fundamental question of what operation children apply to ellipsis phenomena which require a linguistic antecedent. In particular, we compare phonological deletion with syntactic deletion. Phonological deletion is a deletion which applies to PF outputs (i.e. a string of sounds), whereas syntactic deletion is one which applies to syntactic objects. Both types of deletion are allowed in Universal Grammar. For example, English allows initial material omission such as (1) in colloquial speech.

(1)  

a. Seen Tom? (Have you seen …)  
b. 'Fessor you expected is here. (The professor …)  

(Napoli 1982, 85)

According to Napoli (1982), deletion in (1) is a phonological operation because syntactic operations in general cannot be applied to a non-constituent or a part of a word as in (1).¹

On the other hand, ellipsis phenomena requiring a linguistic antecedent are not derived by phonological deletion (Merchant 2001). (2) shows that the adjunct island violation, in which the wh-phrase moves out of the conditional clause, can be ameliorated by eliding the embedded TP (i.e. sluicing).

(2)  

Ben will be mad if Abby talks to one of the teachers,

a. *but she couldn’t remember which \[_{TP}Ben will be mad if she talks to\].

b. but she couldn’t remember which \[_{TP}…\]  

(Merchant 2001, 88)

¹ Phonological deletion is often assumed to be used in VP-ellipsis as Chomsky and Lasnik (1993) and Tancredi (1992) regard VP-ellipsis as an extreme case of deaccenting. However, as we will see shortly, VP-ellipsis in (3) and (4) cannot be analyzed as a phonological one.
If the island violation in (2a) comes from a syntactic reason, deletion in (2b), which ameliorates it, should be also syntactic. Thus, the contrast in (2) suggests that ellipsis is not a mere phonological deletion. Furthermore, it has been reported that ellipsis cancels the polarity sensitivities of polarity items (Sag 1976; Johnson 2001). In English, an NPI anyone must take scope under negation as shown in (3b), whereas a PPI someone cannot take scope under negation as can be seen in (4b). However, their polarity sensitivity disappears when they are elided. (3a), which contains the covert NPI anyone in the ellipsis site, is grammatical without negation. On the other hand, the covert PPI someone can be interpreted under negation in (4a). Thus, deletion here affects interpretation.

(3) John didn’t see anyone,
   a. but Mary did.
   b. *but Mary did see anyone.

(4) John saw someone,
   a. but Mary didn’t. (not > some/ *some > not)
   b. but Mary didn’t see someone. (*not > some/ some > not)

(Merchant 2013, 446)

We argue that this type of deletion is not a phonological operation but a syntactic operation so that it can affect interpretation.

Given that both phonological and syntactic deletion are allowed in Universal Grammar, a question that immediately arises is whether children can distinguish these operations that are very alike. In this paper, we pursue this question by testing whether children know that deletion in ellipsis can cancel a polarity sensitivity of Japanese PPI. If children’s ellipsis is derived by phonological deletion, they should always interpret elliptical sentences in the same way as their overt counterparts because phonological deletion does not change interpretation of a sentence. On the other hand, if children know that ellipsis is derived by syntactic deletion, they should be sensitive to different interpretations between covert and overt PPI as in (4). The organization of this paper is as follows. In Section 2, we see that both types of deletion are allowed in Japanese. Section 3 reviews previous studies on acquisition of ellipsis in Japanese and we point out that none of them can tell whether children’s ellipsis is derived by phonological or syntactic deletion. Section 4 presents our experiment. Section 5 concludes this paper.

2. Deletions in Japanese

We first see that phonological deletion is allowed in Japanese. According to Mukai (2003), gapping examples such as (5) are derived by what she calls String Deletion as in (6).
(5) Mike-ga raion-ni, Tom-ga [RC kuma-ni osowareta otoko]-o tasuketa.
Mike-NOM lion-DAT Tom-NOM bear-DAT was.attacked man-ACC saved
‘Mike saved the man who was being attacked by lions, and Tom saved the
man who was being attacked by bears.’

(6) Mike-ga [RC raion-ni osowareta otoko]-o tasuketa,
Tom-ga [RC kuma-ni osowareta otoko]-o tasuketa.

She argues that a right-node-raising analysis such as (7) is not applied in (5).
Under the right-node-raising account, the ni-marked phrases move out of the
relative clauses as shown in (7b) and this movement should violate an island-
constraint as in (8). Thus, the right-node-raising account predicts that (5) should
be ungrammatical, contrary to the fact.

(7) a. [&P [IP Mike-ga [IP [RC raion-ni osowareta otoko]-o tasuketa]]
   & [IP Tom-ga [IP [RC kuma-ni osowareta otoko]-o tasuketa]] ]

b. [&P [IP Mike-ga [IP raion-ni [IP [RC t osowareta otoko]-o tasuketa]]]
   & [IP Tom-ga [IP kuma-ni [IP [RC t osowareta otoko]-o tasuketa]]]] ]

c. [&P [IP Mike-ga [IP raion-ni [tIP]]]
   & [IP Tom-ga [IP kuma-ni [tIP]] [IP [RC t osowareta otoko]-o tasuketa]]]

(8) *Raion-ni, Mike-ga [RC t; osowareta otoko]-o tasuketa.
Lion-DAT Mike-NOM was.attacked man-ACC saved
‘Mike saved the man who was being attacked by lions.’

On the other hand, Mukai’s String Deletion approach can straightforwardly
account for the island-insensitivity of (5); the remnant raion-ni does not move as
shown in (6). We take this deletion as a phonological operation because it applies
to a phonological string, not a syntactic object such as a constituent.

Japanese also has syntactic deletion, which cancels polarity sensitivities and
must take scope over negation as in (9).

(9) John-wa [supeingo-mo furansugo-mo] hanas-ana-i.
John-TOP Spanish-also French-also speak-NEG-PRES
(and > not): ‘It is both Spanish and French that John does not speak.’
*(not > and): ‘It is not the case that John speaks Spanish and French.’

On the other hand, Funakoshi (2013) argue that this PPI property of -mo-mo
conjunction can be canceled when it undergoes ellipsis.
(10) a. Mary-wa [supeingo-mo furansugo-mo] hanas-u ga, Mary-TOP Spanish-also French-also speak-PRES but ‘Mary speaks Spanish and French, but…’

b. John-wa  hanas-ana-i. John-TOP speak-NEG-PRES (and > not): ‘It is both Spanish and French that John does not speak.’
(not > and): ‘It is not the case that John speaks Spanish and French.’ (Funakoshi 2013, 15)

Crucially, the (not > and) reading is available in (10) in contrast to its overt counterpart (9). This contrast in interpretation suggests that ellipsis here is derived by syntactic deletion because by assumption phonological operations do not affect interpretations.

Therefore, Japanese has two types of deletion, phonological deletion and syntactic deletion. The question we want to address is which operation children apply to ellipsis phenomena, phonological deletion or syntactic deletion. In the next section, we will review previous studies on acquisition of ellipsis in Japanese, but we will see that none of them can tell whether children’s ellipsis is derived by phonological deletion or syntactic deletion.

3. Previous studies

Acquisition of ellipsis has recently been paid attention to in Japanese (Fujiwara 2017; Fujiwara and Shimada 2019; Matsuo 2007; Otaki and Yusa 2009, 2012; Otaki 2014; Sugisaki 2007, 2009, 2012, 2013a, 2013b). Their main concern is whether children can access ellipsis interpretations such as sloppy interpretation (11), quantificational interpretation (12), and adjunct interpretation (13). Crucially, these interpretations cannot be obtained with a phonologically null pronoun, pro.


b. Buta-san-mo aratte-ru yo. Pig-Mr.-also wash-PRES PRT Ellipsis: ‘The pig is also washing his own tricycle.’ Pronoun: ‘The pig is also washing it (= the panda’s tricycle).’ (Sugisaki 2007, 607)

b. Kitune-san-mo ________________ ket-ta yo.
   Fox-Mr.-also kick-PAST PRT
   Ellipsis: ‘The fox also kicked (a new set of) three balls.’
   Pronoun: ‘The fox also kicked them (= the balls the bear kicked).’
   (Otaki 2014, 157)

(13) a. Raion-wa kureyon-o motodoorini sima-e-ta kedo,
   Lion-TOP crayon-ACC same.as.before put.away-can-PAST but
   ‘Lion was able to put away crayons the same as before, but…’

   Frog-TOP put.away-can-NEG-PAST
   Ellipsis: ‘Frog could not put away crayons the same as before.’
   Pronoun: ‘Frog could not put away them at all.’
   (Fujiwara 2017, 267)

Sugisaki (2007, 2009, 2013a), Otaki and Yusa (2012) and Fujiwara (2017) have reported that children around age five can access the ellipsis interpretations such as (11), (12) and (13), respectively. Thus, according to their results, children at this age already know a deletion operation. However, it is not clear which operation children apply to ellipsis, phonological deletion or syntactic deletion. This is because the ellipsis interpretations in (11), (12) and (13) are the same as the interpretations of their overt counterparts as shown in the following:

(14) a. Buta-san-mo zibun-no sanrinsya-o aratte-ru yo. (cf. 11b)
   Pig-Mr.-also self-GEN tricycle-ACC wash-PRES PRT
   ‘The pig is also washing his own tricycle.’

b. Kitune-san-mo san-ko-no booru-o ket-ta yo. (cf. 12b)
   Fox-Mr.-also three-CL-GEN ball-ACC kick-PAST PRT
   ‘The fox also kicked three balls.’

c. Kaeru-wa kureyon-o motodoorini sima-e-nakat-ta. (cf. 13b)
   Frog-TOP crayon-ACC same.as.before put.away-can-NEG-PAST
   ‘Frog could not put away crayons the same as before.’

Thus, in order to address the relevant question, we must check interpretations such as the (not > and) reading in (10). Recall that this reading cannot be obtained from its overt counterpart (9). In fact, Fujiwara and Shimada (2019) try to see whether children can access this reading in sentences like (15). The method of our experiment was a truth value judgment task (TVJT; Crain and McKee 1985).

(15) Zibanyan-wa [ninjin-mo piiman-mo] tabe-re-ta kedo,
   Zibanyan-TOP carrot-also pepper-also eat-can-PAST but
   ‘Zibanyan managed to eat the carrot and the pepper, but….’
The target situation was that Zibanyan eats both a carrot and a pepper, but a penguin eats only one of them. In this situation, (15a) is false and (15b) true. Ten children at age 5;3-5;11 (mean 5;8) and 10 adults participated. There were two control items like (15a) and two target items like (15b). The adult participants accepted the target items at the rate of 95% (19/20) and completely rejected the control items in the situation above. This indicates that they accessed the (not > and) reading only when the coordinated objects undergo deletion. This means that the deletion operation applied here is syntactic because it changes an interpretation of the sentence. In contrast, the child participants accepted the target items at the rate of only 35% (7/20), while they perfectly rejected the control items. This result shows that children even at around age 5 are not as sensitive to the (not > and) reading as adults, which suggests that ellipsis in child grammar is derived by phonological deletion, in contrast to ellipsis in adult grammar.

However, as we discussed in the paper, we cannot exclude the possibility that the children in our experiment did not apply ellipsis. In other words, they might not have used ellipsis to interpret the null object in (15b). Although many previous studies observe that children can apply ellipsis to derive null elements (Sugisaki 2007, 2009, 2013a; Otaki and Yusa 2012; Fujiwara 2017), there are in fact some studies reporting that children tend to interpret null objects without applying ellipsis (Matuo 2007; Otaki and Yusa 2009). If children do not use ellipsis, the null object in (15b) should be interpreted as pro, and the sentence should be interpreted as in (16).

(16) Pengin-wa sore-ra-o tabe-re-nakat-ta.
    Penguin-TOP it-PL-ACC eat-can-NEG-PAST
    ‘The penguin couldn’t eat them (= the carrot and the pepper).’

Note that the interpretation of (16) corresponds to the (and > not) reading of (15b). Therefore, it may not be the case that the participants in Fujiwara and Shimada (2019) applied phonological deletion. Rather, it is also reasonable that they preferred using pro to ellipsis as Matsuo’s (2007) and Otaki and Yusa (2009) studies suggest. Therefore, in order to see the nature of ellipsis, we first have to
test whether children can apply ellipsis to null elements or not. The experiment presented in the next section is designed to satisfy this condition.

4. Experiment

Seventeen children (age 5;5-6;4, Mean 5;9) and 13 adults participated in this experiment. The method was TVJT with question-answer pairs. In this method, a puppet was asked a question after a story, and participants were asked to judge whether puppet’s answer matched the story or not. In order to see the nature of children’s ellipsis, we first tested question-answer pairs like (17).

(17) Q: Zou-wa mit-tsu-no koppu-o kat-ta kana?
Elephant-TOP three-CL-GEN cup-ACC buy-PAST Q
‘Did the elephant buy three cups?’

A: Uun, zou-wa  kaw-anak-atta yo.
No elephant-TOP buy-NEG-PAST PRT
Lit. ‘No, the elephant did not buy _____.’
Ellipsis: ‘The elephant did not buy three cups.’
Pronoun: ‘The elephant did not buy them (= the three cups).’

The question-answer pair in (17) was given after a story like the following: a pig buys three cups, while an elephant buys two because three cups are too heavy for him. In this story, (17A) is true under the ellipsis reading, while it is false under the pronoun reading. There were three items like (17). The verbs we used were taberu ‘eat’, kau ‘buy’, and hakobu ‘carry’. The adult participants completely accepted them, and the child participants accepted them at the rate of 84.3% (43/51). We exclude children who rejected this item two times or more from the analysis of our target sentences since we cannot tell whether they applied ellipsis in (17A) or not. Two out of the 17 children were excluded because of this criterion.

Our target items are given in (18). (18a) contains an overt conjunction, while it is elided in (18b). We tested (18) in the following situation: a penguin buys a cabbage and radish, while a dog buys only a radish because two vegetables are too heavy for him. The final scene of the story is given in Figure 1.

---

2 The truth value of the pronoun reading of (17A) can be confirmed by sentences like (i), where an object position is occupied by a definite noun referring three cups. (i) is false in the story used for (17).

(i) A: Uun, zou-wa sore-ra-o/ sono-mit-tsu-no koppu-o kaw-anak-atta yo.
No elephant-TOP it-PL-ACC this-three-CL-GEN cup-ACC buy-NEG-PAST PRT
‘No, the elephant did not buy them/ the three cups.’
(18) Q: Inu-wa [kyabetsu-mo daikon-mo] kat-ta kana?
   Dog-TOP cabbage-also radish-also buy-PAST Q
   ‘Did the dog buy the cabbage and the radish?’

      No dog-TOP cabbage-also radish-also buy-NEG-PAST
      lit. ‘No, the dog did not buy the cabbage and the radish.’
      (and > not / *not > and)

      No dog-TOP __________________________ buy-NEG-PAST
      lit. ‘No, the dog did not buy ______.’ (and > not / not > and)
      (and > not): ‘The dog bought neither the cabbage nor the radish.’
      (not > and): ‘It is not the case that the dog bought both the cabbage
      and the radish.’

Figure 1: the final scene of the story for (18)

In this story, (18a) is a false statement, while (18b) is a true statement. As we saw
above, there were 15 screened children who accessed the ellipsis interpretation in
the screening items like (17). Our main concern is whether ellipsis applied by
these children is derived by a syntactic operation or phonological operation. If
their ellipsis is derived by syntactic deletion like adults, they should accept (18b)
in this situation. On the other hand, if it is derived by phonological deletion, they
should reject (18b) as well as (18a). There were three trials for each item. Again,
taberu ‘eat’, kau ‘buy’, and hakobu ‘carry’ were used. Table 1 summarizes the
result of the target items.
Table 1: the result of the target items

<table>
<thead>
<tr>
<th>Correct answer</th>
<th>15 screened children</th>
<th>Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>(not &gt; and)</em></td>
<td>Reject</td>
<td>36/45 rejection (80%)</td>
</tr>
<tr>
<td>OK*(not &gt; and)*</td>
<td>Accept</td>
<td>34/45 acceptance (75.6%)</td>
</tr>
</tbody>
</table>

The adults completely rejected (18a) and accepted (18b), which replicates the result of Fujiwara and Shimada’s (2019) experiment. The 15 screened children rejected (18a) at 80%, while they accepted (18b) at 75.6%. This contrast is significant by Wilcoxon Signed-Rank Test ($Z=2.88$, two-tailed $p=.0004$). This shows that the children were sensitive to the different interpretation between the overt conjunction and the elided conjunction like adults, which further suggests that children at around age five already know that ellipsis is derived by syntactic deletion.

5. Conclusion

In this paper, we have investigated which operation children apply to ellipsis, phonological deletion or syntactic deletion. Although both types of deletion are allowed in Universal Grammar, ellipsis phenomena such that they require a linguistic antecedent seem to be derived by syntactic deletion given that ellipsis ameliorates island sensitivity and cancels polarity sensitivities. In our experiment, we observed that children at around age 5 know that ellipsis cancels the PPI property of Japanese conjunction -mo-mo. This result suggests that children at this age know that deletion operation in ellipsis is a syntactic operation.

This conclusion immediately leads us to the next question: “How do children know that ellipsis is a syntactic phenomenon?” We argue that this syntactic nature of ellipsis is not learned since the evidence which shows the difference between phonological deletion and syntactic deletion is extremely rare in input. Rather, we conjecture that its acquisition is guided by a principle of UG. If this is correct, children would be expected to acquire the syntactic nature of ellipsis at an earlier age. We would like to leave this issue for future research.

References


