Sluicing and Its Identity Conditions in the Acquisition of Japanese

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1. Introduction

Ellipsis has been of central interest to both theoretical and acquisition research within the generative framework, primarily because it represents a situation where the usual mappings between form and meaning break down: In ellipsis, certain meanings are assigned to the parts of the sentence which appear to be missing. Given that elided parts of the sentence are not “visible” in the primary linguistic data available to children, the mechanisms and constraints that underlie the relevant form-meaning correspondence should be directly rooted in our innate language faculty called UG. Thus, investigations into the nature and the acquisition of ellipsis constructions should provide us with a privileged window onto biologically-determined UG.

In the syntactic studies of English, the best-investigated instances of ellipsis include sluicing as in (1a) and VP-ellipsis as in (2a). In each case, the second clause can be understood as in (1b) and (2b), respectively.

(1) a. Lauren can play something, but I don’t know what.
    b. Lauren can play something, but I don’t know what Lauren can play.

(2) a. Lauren can play the guitar and Mike can, too.
    b. Lauren can play the guitar and Mike can play the guitar, too.

In languages like Japanese and Korean, another type of ellipsis construction appears to be available, in which argument DPs are elided. According to Kim (1999), Oku (1998), Saito (2007), and Takahashi (2008) (among many others), such argument ellipsis is the source for the sloppy-identity interpretation for the unpronounced subject in the embedded clause.

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1. The examples are taken from Merchant (2015).

In the acquisition literature, VP-ellipsis as in (2a) has been the major focus of interest, and a large number of experiments have already been conducted to examine children’s knowledge about this type of ellipsis (see e.g. Foley et al. 2003, Matsuo & Duffield 2001, Thornton & Wexler 1999). In addition, a growing number of studies are paying attention to children’s knowledge of argument ellipsis and its constraints (see e.g. Otaki 2014; Otaki & Yusa 2012; Sugisaki 2007, 2013). In contrast, extremely few studies have investigated the acquisition of sluicing as in (1a), despite the fact that the sluicing construction appears to be far more widespread cross-linguistically²: Merchant (2001) provides evidence from 24 languages to motivate his PF-deletion approach to sluicing. This pervasive (and presumably universal) availability of this ellipsis construction leads us to expect that investigations into the acquisition of sluicing would shed more light on the role of UG in child language acquisition.

In light of this background, this study addresses the question of whether Japanese-speaking preschool children are sensitive to a certain identity condition on the sluicing construction: more specifically, the constraint that requires the elided material and the antecedent phrase to match in voice (Merchant 2013; see also Chung 2013). The results, even though preliminary, suggest that these children are sensitive to the ban on voice mismatches in sluicing.

2. Sluicing and Its Identity Conditions

Sluicing is the name given by Ross (1969) to the transformational rule by which he accounted for the phenomenon illustrated in (4) and (5), in which an interrogative clause is reduced to containing only a wh-phrase. This wh-phrase may correspond to an overt correlate (underlined in (4)), or not (as in (5)). In the following, I use the term sluicing to refer to elliptical interrogative clauses as in (4) and (5). The isolated wh-phrases are referred to as sluices.

² As far as I am aware, those few studies include Wood (2009), which investigated the acquisition of sluicing in English, and Lindenbergh et al. (2015), which examined Dutch-speaking children’s knowledge of sluicing.
(4) a. Jack bought something, but I don’t know what.
   b. Someone called, but I can’t tell you who.

(5) a. Jack called, but I don’t know {when/how/why/from where}.
   b. Sally’s out hunting – guess what!

(6) a. Jack bought something, but I don’t know what Jack bought.
   b. Someone called, but I can’t tell you who called.

(7) a. Jack called, but I don’t know {when/how/why/from where} Jack called.
   b. Sally’s out hunting – guess what Sally’s out hunting!

Given that the elliptical clauses in (4) and (5) are synonymous with their full counterparts in (6) and (7), the elided material must be identical with the antecedent in one way or another. Defining the relevant identity condition has been one of the central concerns in the theoretical studies on sluicing (as well as in those on other types of ellipsis). Merchant (2001) argues that such isomorphism constraint is basically semantic in nature, based in part on examples like (8), where a gerund in the antecedent corresponds to an infinitive in the sluice.

(8) Decorating for the holidays is easy if you know how!
   a. ≠ ... how [decorating for the holidays]
   b. = ... how [to decorate for the holidays]. (Merchant 2001:22)

Building on Schwarzschild’s (1999) theory of focus, Merchant (2001) defines the identity condition in terms of eGivenness, essentially requiring a bidirectional entailment to hold between the elided and antecedent materials. This condition successfully accounts for the grammaticality of (8), since the ellipsis site and its antecedent are syntactically different but are still semantically identical.

More recently, however, Merchant (2013) argues that the ungrammaticality of examples like (9a) poses a serious challenge to theories that posit only semantic identity based on entailment relations: Since active and passive clauses are mutually entailing, the relevant semantic isomorphism should allow such voice mismatches in sluicing. Note that mismatches in voice between similarly related nonelliptical clauses in discourse are permitted, as illustrated in (9b).

(9) a. * Someone hired Joe, but we don’t know by whom.
   b. Someone hired Joe, but we don’t know by whom Joe was hired.

Merchant (2013) further observes that, in sharp contrast to sluicing, VP-ellipsis allows mismatches in voice, as exemplified in (10).

(10) a. I have implemented it with a manager but it doesn’t have to be.
    b. This problem was to have been looked into, but obviously nobody did.
In order to account for the empirical contrast in the possibility of voice mismatches between sluicing and VP-ellipsis, Merchant (2013) postulates a syntactic identity condition, which dictates that any elided Voice head must bear the same feature (either Active or Passive) as the one in its antecedent. Let us consider the simplified structure for the ungrammatical sluicing in (9a) and the grammatical VP ellipsis in (10a), which are given in (11) and in (12), respectively.

(11) a. \[TP \text{ someone} T [VoiceP Voice_{\text{[Active]}} [vP t_1 \text{ v}_{\text{trans}} \text{ hire Joe }]]] \\
    b. \[CP \text{ by whom} [TP \text{ Joe}_2 \text{ was } [VoiceP Voice_{\text{[Passive]}} [vP t_1 \text{ v}_{\text{trans}} \text{ hire } t_2 ]]]\]

(12) a. \[TP I_1 \text{ have} [VoiceP Voice_{\text{[Active]}} [vP t_1 \text{ v}_{\text{trans}} \text{ implement it } ] ] \]
    b. \[TP \text{ it}_1 \text{ doesn’t have to be } [VoiceP Voice_{\text{[Passive]}} [vP Arg \text{ v}_{\text{trans}} \text{ implement } t_2 ]]\]

In the case of sluicing, the phrase targeted by ellipsis is TP, which necessarily contains VoiceP. Thus, the syntactic identity condition mentioned above rules out voice mismatches. In contrast, for VP-ellipsis, the target of ellipsis does not include the Voice head as shown in (12b), and hence it is not subject to the elliptical identity requirement. Thus, under Merchant’s (2013) analysis, the constraint on syntactic featural identity between the Voice heads, together with the difference in the height of ellipsis, provides an account for why voice mismatches are permitted in VP-ellipsis but disallowed in the case of sluicing.

In sum, Merchant (2013) argues that the syntactic identity condition given in (13) is responsible for the unavailability of voice mismatches in sluicing.

(13) **Syntactic Identity Condition on Ellipsis:**
Voice heads internal to the ellipsis site must bear the same features as those in its antecedent phrase.

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3. Under the assumption that an active predicate and its passive counterpart have different argument structures, Chung (2013) attempts to explain the ungrammaticality of (9a) by postulating a constraint that the predicate in the ellipsis site must have an argument structure identical to that of the corresponding predicate in the antecedent (*Argument Structure Condition*). See Chung (2013) for details, and also Takita (2015) for its problems and reformulations.

4. Arg in (12b) refers to an indefinite subject which is phonologically null.

5. See Nakamura (2013) for an interesting observation that Merchant’s (2008, 2013) analysis makes a false prediction in certain cases.
3. Sluicing in Japanese

It has been observed at least since Inoue (1978) that Japanese permits a construction which is analogous to sluicing in English, even though it is a wh-in-situ language. In (14), the second conjunct contains an incomplete embedded clause, which consists of a wh-phrase and the Q(uestion)-marker, and it receives the same interpretation as (15), which contains a full indirect question.

(14) Mary-ga nanika-o katta rasii ga, Mary-NOM something-ACC bought likely but boku-wa [ nani-o ka ] wakaranai. I-TOP what-ACC Q know.not ‘It is likely Mary bought something, but I don’t know what.’ (Takahashi 1994:266)

(15) Boku-wa [ kanojo-ga nani-o katta ka ] wakaranai. I-TOP she-NOM what-ACC bought Q know.not ‘I don’t know what she bought.’

Fukaya & Hoji (1999:145) observe that the case-marker on the wh-phrase is optional, as indicated in (16).

(16) John-wa dareka-ni atta rasii ga, boku-wa John-TOP someone-DAT met seem but I-TOP [ dare(-ni) ka ] wakaranai. who-DAT Q know.not ‘It seems that John met someone, but I don’t know who.’

They claim, however, that only those examples in which the wh-phrase is accompanied by a case-marker (which they call CM-sluicing) corresponds to the sluicing construction of the English type. One piece of evidence for this view is based on the observation made by Hankamer & Sag (1976:408) that sluicing in English requires a linguistic antecedent.

(17) Hankamer: Someone's just been shot.
    Sag: Yeah, I wonder who.
(18) [Context: Hankamer produces a gun, points it off stage and fires, whereupon a scream is heard.]
    Sag: # Jesus, I wonder who.

In Japanese, CM-sluicing behaves like English sluicing in that it needs a linguistic antecedent, whereas non-CM-sluicing can be pragmatically controlled and hence is acceptable without any linguistic antecedent, as illustrated in (19).
(19) [Context: The angry voice of a teacher whom John and Bill both know is coming out of a room. The teacher is obviously scolding someone.]

John (to Bill): (Boku-wa) [dare(*-o) ka] sitteru yo.
I-TOP who-ACC Q know
‘I know who.’
(intended as ‘I know who the teacher is scolding’.)

In light of this observation, our discussion of Japanese sluicing below is limited to those examples in which the remnant wh-phrase is followed by a case-marker.

Takahashi (1994) observes that sluicing in Japanese patterns in the same way as sluicing in English in that it permits sloppy-identity interpretation. In English, the example in (20) from Ross (1969:274) can be interpreted in two ways: One interpretation is that ‘Bill knows how to say I’m sorry’ (the strict-identity interpretation), and the other interpretation is that ‘Bill knows how to say he (= Bill) is sorry’ (the sloppy-identity interpretation). The example in (21) shows that the same holds for Japanese.

(20) I know how to say I’m sorry, and Bill knows how, too.

(21) John-wa [zibun-ga naze sikarareta ka] wakatteinai ga,
John-TOP self-NOM why scolded.was Q know.not but
Mary-wa [naze ka] wakatteiru.
Mary-TOP why Q know
‘John doesn’t know why he was scolded, but Mary knows why.’

Takahashi (1994:268) observes that the second conjunct in (21) is ambiguous: It permits not only the interpretation that Mary knows why John was scolded (strict-identity interpretation), but also the interpretation that Mary knows why Mary herself was scolded (sloppy-identity interpretation).

Takahashi (1994) and Saito (2004) add to this an interesting observation that the sentence in (22), which minimally differs from (21) in that it has the copula da, still permits sloppy interpretation.6

(22) John-wa [zibun-ga naze sikarareta ka] wakatteinai ga,
John-TOP self-NOM why scolded.was Q know.not but
Mary-wa [naze da ka] wakatteiru.
Mary-TOP why is Q know
‘John doesn’t know why he was scolded, but Mary knows why.’

6. Takita (2009) observes that Japanese permits limited situations in which sluicing of the English type is available: Sluicing with control predicates that select interrogative non-finite complements do not co-occur with a copula, and behaves in exactly the same way as English sluicing with respect to other properties (e.g. island repair). See Takita (2009) for a detailed discussion of such ‘genuine’ sluicing in Japanese.
The presence of this copula can be straightforwardly accounted for if sluicing in Japanese is derived from a cleft construction, whose typical example is provided in (23). The CP subject expresses the presupposition, and the phrase preceding the copula constitutes the focus.

\[(23) \quad [\text{CP} \quad [\text{TP} \quad \text{Doroboo-ga} \quad \text{okane-o} \quad \text{nusunda} \quad \text{no} \quad \text{wa} \quad \text{sono} \quad \text{ginkoo-kara} \quad \text{da}. \quad \text{that} \quad \text{bank} \quad -\text{from} \quad \text{is} \quad \text{‘It is from that bank that a thief stole money.’}]
\]

While the appearance of the copula element requires that sluicing in Japanese is derivationally related to the cleft construction, the availability of the sloppy interpretation indicates that some sort of deletion is involved in its derivation. In order to reconcile these observations, Saito (2004) develops the “concealed cleft” analysis of Japanese sluicing proposed in Nishiyama et al. (1996), Kuwabara (1997), and Kizu (1997), and argues that the sluicing construction in Japanese is derived by applying argument ellipsis (e.g. Oku 1998, Kim 1999) to the CP subject of the cleft sentence. Under Saito’s (2004) analysis, the sluicing examples in (21) and (22) have the structure shown in (24).

\[(24) \quad \text{Mary-wa} \quad [\text{[CP} \quad \text{Op1} \quad [\text{TP} \quad \text{zibun-ga} \quad \text{t\textsubscript{1}} \quad \text{sikarareta} \quad \text{no} \quad \text{ga} \quad \text{naze\textsubscript{1}} \quad \text{(da) ka} \quad \text{wakatteiru}. \quad \text{why} \quad \text{is} \quad \text{Q know}]
\]

This analysis, in which Japanese sluicing is viewed as a cleft sentence with an elided subject CP, solves the puzzles that accompany this construction. Since sluicing in Japanese stems from a cleft construction, it can contain a copula element right after the wh-phrase in the focus position. In addition, since Japanese sluicing instantiates deletion of the subject CP, the availability of the sloppy interpretation is correctly expected.

Adopting Saito’s (2004) analysis of Japanese sluicing as a cleft sentence with an elided subject CP, let us now consider how sluicing in Japanese behaves with voice mismatch discussed in the previous section. The ungrammaticality of the example in (25) shows that voice mismatch cannot occur with Japanese sluicing. Note that the nonelliptical counterpart in (26) is well-formed, which suggests that the ill-formed status of (25) stems from the ellipsis itself.

\[(25)*\quad \text{Dareka-ga} \quad \text{John-o} \quad \text{yatotta rasii ga}, \quad \text{someone-NOM} \quad \text{John-ACC} \quad \text{hired} \quad \text{seem} \quad \text{but} \quad \text{boku-wa} \quad [\text{dare-ni ka} \quad \text{siranai} \quad \text{I-TOP} \quad \text{who-by} \quad \text{Q know.not} \quad \text{‘Someone hired John, but I don’t know by whom.’}]
\]
Dareka-ga  John-o  yatotta rassii  ga,  
someone-NOM John-ACC hired seem but  
boku-wa [ John-ga  dare-ni  yatowareta  ka ]  siranai  
I-TOP John-NOM who-by was.hired  Q  know.not  
‘Someone hired John, but I don’t know by whom John was hired.’

The unavailability of voice mismatches with Japanese sluicing should be 
expected under Saito’s (2004) analysis. The relevant structures are shown in (27). 
What undergoes ellipsis in this structure is not a usual TP as in the case of English 
sluicing, but the CP subject of the cleft sentence. Still, the ellipsis site is large 
enough to contain the Voice head that is distinct in its feature from the antecedent 
clause. Thus, the application of the relevant ellipsis violates the Syntactic Identity 
Condition given in (13), and the ungrammaticality of (25) follows.

someone-NOM John-ACC hired seem but  

I-TOP John-NOM hired.was  that-NOM  
dare-ni1  ka ]  siranai.  
who-by  Q  know.not

To summarize this section, we have seen that Japanese permits a construction 
which looks like sluicing in English. The (optional) appearance of the copula 
element right after the remnant wh-phrase, as well as the availability of sloppy 
interpretation, has led Saito (1994) to analyze this construction as a cleft 
construction in which the CP subject has undergone argument ellipsis. This 
analysis correctly predicts that voice mismatches are not allowed in sluicing in 
Japanese. In the next section, I report the results of my own experiment which 
attempts to determine whether Japanese-speaking children have the knowledge 
regarding the illicitness of voice mismatches in Japanese sluicing.


If the Syntactic Identity Condition on Ellipsis given in (13) reflects certain 
principles of UG, we can expect that children conform to this condition from the 
earliest observable stages. In order to investigate whether the ban on voice 
mismatches in sluicing, which instantiated (13), is indeed in the grammar of 
Japanese-speaking preschool children, I conducted an experiment with 21 
Japanese-speaking children, ranging in age from 4(years);07 (months) to 6;06 
(mean age, 5;07). These children were divided into two groups. One group of 
children, which we call the mismatch group, was presented with test sentences
involving voice mismatches: The antecedent clause was in the active voice while the elided clause was in the passive voice. The other group of children, which we call the \textit{match group}, was presented with test sentences without voice mismatches: Both the antecedent and the elided clauses were in the passive voice.

The task for children was question-after-story. In this task, each child was told a story, which was accompanied by a series of pictures presented on a laptop computer. At the end of each story, a puppet asked a question about what had happened in the story. The task for the child was to answer these questions.

The experiment consisted of four sentences to check children’s understanding of the active and passive sentences (two active transitive sentences and two passive sentences), and four sentences to examine children’s knowledge of the ban on voice mismatches in sluicing.

The sample test sentence for each group is shown in (28) and (29).

\textbf{(28) Sample Test Sentence for the Mismatch Group:}

\begin{verbatim}
Dareka-ga kaminoke-o hippatta tte raionsan-ga itteta kedo,
someone-NOM hair-ACC pulled that lion-NOM said but [ dare-ni ka ] wakaru ? who-DAT Q know
\end{verbatim}

‘The lion said that someone pulled his hair, but do you know to whom?’

\textbf{(29) Sample Test Sentence for the Match Group:}

\begin{verbatim}
Dareka-ni kaminoke-o hippar-are-ta tte raionsan-ga itteta kedo, [ dare-ni ka ] wakaru ?
someone-by hair-ACC pull-PASS-PAST that lion-NOM said but who-by/DAT Q know
\end{verbatim}

‘The lion said that his hair was pulled by someone, but do you know to whom / by whom?’

These test sentences crucially rely on the ambiguity of \textit{-ni} in Japanese. As discussed in detail in Sadakane & Koizumi (1995), \textit{-ni} in Japanese has a variety of uses. In one meaning, it corresponds to the use of the English preposition \textit{to} expressing the Goal as in (30a). In the other use, it corresponds to the English preposition \textit{by} appearing in passive sentences as in (30b). In light of such ambiguity, when children are presented with sentences like (28) which potentially include mismatch in voice, those children who have the knowledge about the ban on voice mismatches in sluicing should interpret the \textit{-ni} phrase not as a \textit{by}-phrase but as the Goal argument of the matrix verb \textit{say}. On the other hand, when these children are presented with sentences like (29) in which the antecedent clause and the ellipsis clause match in voice, they should allow the interpretation of \textit{-ni} as a \textit{by}-phrase, as well as the interpretation of \textit{-ni} as the Goal argument of the matrix verb \textit{say}.
(30) a. The lion said to someone that his hair was pulled.
b. The lion said that his hair was pulled by someone.

The sample stories that accompanied (28) and (29) are presented in (31) and (32), respectively. (The only difference between these two stories is whether the very last sentence is in the active voice or in the passive voice.)

(31) Sample Story for the Mismatch Group:
Lion and Panda are playing with their favorite toy trains at the Spector Kindergarten. Then, a naughty boy suddenly appeared, and pulled Lion’s hair. Lion was very surprised, and looked back quickly, but he could not find anyone. Lion’s favorite teacher came in and asked him what happened, so Lion told the teacher that someone pulled his hair.

(32) Sample Story for the Match Group:
Lion and Panda are playing with their favorite toy trains at the Spector Kindergarten. Then, a naughty boy suddenly appeared, and pulled Lion’s hair. Lion was very surprised, and looked back quickly, but he could not find anyone. Lion’s favorite teacher came in and asked him what happened, so Lion told the teacher that his hair was pulled by someone.
In order for children to conform to the ban on voice mismatches, they must be able to understand passive sentences correctly. Yet, it is independently known in the acquisition literature that young children seem to have trouble interpreting full direct passive sentences (e.g. Borer & Wexler 1987, Sugisaki 1999). Thus, when analyzing our results, we included only those children who answered correctly to all of the four active / passive trials and hence was confirmed to have a full understanding of the active and passive sentences. Three children failed to meet this criterion.

The results obtained from the remaining 18 children are summarized in Table 1.

<table>
<thead>
<tr>
<th>Group</th>
<th>Number of Children</th>
<th>Interpretation of (wh-ni)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>As to-phrase associated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>with the matrix verb \textit{say}</td>
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<tr>
<td></td>
<td></td>
<td>with the embedded verb</td>
</tr>
<tr>
<td>Mismatch Group</td>
<td>9</td>
<td>91.7% (33/36)</td>
</tr>
<tr>
<td>Match Group</td>
<td>9</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 1: Summary of the Results

As we can see in Table 1, children in the match group consistently interpreted the \(wh-ni\) phrase as by-phrase associated with the embedded passive verb, despite the fact that \(-ni\) phrase is potentially ambiguous. This suggests that, in the context provided by the story, this use of \(-ni\) was far more salient than the use of \(-ni\) as the Goal argument of the matrix verb \textit{say}. Despite this salience, children in the mismatch group showed a very strong tendency to interpret the \(wh-ni\) phrase as to-phrase associated with the matrix verb \textit{say}. This sharp contrast between the two groups suggest that the ban on voice mismatches in sluicing, which instantiates the Syntactic Identity Condition on Ellipsis given in (13), is already in the grammar of Japanese-speaking preschool children.

5. Conclusion

This study addressed the question of whether Japanese-speaking preschool children are sensitive to the Syntactic Identity Condition on Ellipsis proposed by Merchant (2013), which requires the elided constituent and the antecedent phrase to match in voice. The results of my experiment, even though still preliminary, suggest that Japanese-speaking preschool children already have knowledge of the relevant identity condition. This finding is consistent with the view that such constraint reflects certain principles of UG.

Many questions remain, however. For example, as we have seen in (9) and (10), VP-ellipsis in English can tolerate mismatches in voice, in sharp contrast to
sluicing. Then, a question arises as to whether English-speaking children are sensitive to such contrast between sluicing and VP-ellipsis with respect to the possibility of voice mismatch. This is one of the questions which has to be left for future research.

Despite these loose ends, I believe that this study constitutes a small but significant step toward understanding when and how children acquire the knowledge of sluicing and its constraints.

References


