Invisible Structure: Sluicing in Child Grammar

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1 Introduction

While ellipsis has received some attention within the acquisition literature, there is comparatively little known about children’s production of sluicing – an elliptical construction where only the wh-word remains – despite being a widespread phenomenon in adult grammars; see (1-2) for examples of the “classic” type. There are various kinds of sluices, including those known as fragment questions (as in 3, from Merchant 2003), and these are the focus of this paper.

(1) Alex ate something, but I am not sure what <Alex ate>.
(2) Alex saw someone, but I cannot remember who <Alex saw>.
(3) A: Someone called. B. Really? Who <called>?

It has been argued that children produce verb-phrase ellipsis (VPE) (see Santos 2009), and comprehend VPE (see Matsuo & Duffield 2001; Foley et al. 2003; Matsuo 2007; among others). It has likewise been demonstrated that children understand noun-phrase ellipsis (NPE) (see Wijnen et al. 2004; Goksun et al. 2007). Although additional research arguably needs to be done on VPE and NPE, hardly any research has hitherto addressed children’s production of sluicing, and none that we are aware of has focused on child French in particular. Presumably this gap in the literature is because full sentential phrases that feature sluicing (1-2) are likely believed to be uncommon in early language.

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Nevertheless, here we will argue that French children produce sluices as fragment questions, in naturalistic discourse, from as young as age 2;06 (see 4) on CHILDES (FAT= father, CHI= target child). The example comes from the Leveillé corpus (Suppes et al. 1973; MacWhinney 2000).

(4) FAT: Je vais travailler.
    I go.1SG work.INF
    ‘I am going to work.’

CHI: Où <tu vas travailler> ?
     where <you go.2SG work.INF>
     ‘Where (are you going to work)?’

The purpose of the current study is to (i) provide novel data about children’s spontaneous production of sluicing in French, (ii) contribute to the sparse cross-linguistic literature on children’s production of sluicing and, from a theoretical point of view, (iii) provide an analysis of the data in terms of theories of sluicing in the adult grammar.

2 Sluicing in the Adult Grammar

There are multiple approaches to sluicing within generative syntax, based on what is believed to be (or to not be) at the site of the ellipsis. For example, it has been suggested that sluicing does not involve any underlying structure, see Culicover & Jackendoff (2005); this approach has been referred to as ‘What You See Is What You Get’. Within this approach, as the name suggests, there is nothing after the wh-word; there is no movement or silent structure after the sluice (5). This approach avoids additional structure, but does not explain interpretability constraints. That is, there are restrictions on what the wh-word may refer to; the elided phrase has to be recoverable (Merchant 2001 et seq.). In (5), it is understood that the wh-word ‘what’ corresponds to e.g. the book that Alex read (and not some other action/object unrelated to reading). The interpretation relies heavily on the antecedent.

(5) Alex read something, but I do not know what.

Other analyses are structural approaches, and these all claim that there is something at the ellipsis site, but what that is differs depending on the analysis. In particular, the size of the ellipsis site remains controversial. For example, in the “null pronoun approach” (cf. Chung et al. 1995, among others), pro follows the wh-word (6). An approach that posits more structure at the ellipsis site is the cleft-analysis of sluicing (see van Craenenbroeck 2010), as in (7).
(6) Alex read something, but I do not know what pro.
(7) Alex read something, but I do not know what <it is>.

In (7), the structure (that is, the cleft) is intended to provide some kind of (recoverable) relationship to the antecedent and what is elided. Lastly, there is the Move-and-Delete analysis, argued for by Merchant (2001). Merchant claims that there is an embedded wh-question, and that the wh-word must move from its base position within the ellipsis site to its (overt) position, as in (8). After wh-movement, the material located in TP that follows the moved wh-word is deleted.¹

(8) Alex read something, but I do not know what, <Alex read what>.

It should be noted that French is (potentially) problematic in that it allows for both fronted and wh-in situ wh-questions, and sluicing in wh-in situ languages has long been a puzzle (see Merchant 2003). What is particularly striking about standard French is that the form of the elliptical (sluiced) and non-elliptical phrase is not always equivalent (namely the part in bold).²

(9) a. Jean écrit quelque chose, mais je ne sais pas quoi.
   Jean write.3SG something but I NEG know not what
   ‘John writes something, but I do not know what.’

b. Jean écrit quelque chose, mais je ne sais pas ce qu’il écrit.
   Jean write.3SG something but I NEG know not that what he write.3SG
   ‘John writes something, but I do not know what he writes.’

c. *Jean écrit quelque chose, mais je ne sais pas ce que.
   Jean write.3SG something but I NEG know not that what
   ‘John writes something but I don’t know what.’

¹ There are various reasons related to e.g. case, preposition-stranding, island repair, etc. for a movement-based analysis of ellipsis (see Merchant 2003; Saab 2010; and others for discussion).
² It seems to be possible to use ‘quoi’ in place of ‘ce que’ in some dialects of colloquial French (at least according to my L1 consultants).
It is not possible to use ‘quoi’ (what) in the non-elided counterpart in standard French, and it is certainly never possible to use ‘ce que’ (what) in elided counterparts. This is one of the only wh-words that behaves this way. For example, in (10) the same form is found in both versions.

(10) a. Jean court quelque part, mais je ne sais pas où.
Jean run.3SG somewhere but I NEG know not where
‘John runs somewhere, but I do not know where <he runs>.’

b. Jean court quelque part, mais je ne sais pas où il court.
Jean run.3SG somewhere but I NEG know not where he run.3SG

This is admittedly a non-trivial “quirk” of French. It could be that there are two forms, conditioned by the position in the clause — just as there are two forms of ‘what’ for full wh-questions (as in 11a-b below).³

(11) a. Qu’est-ce qu’il mange ?
Kesk he eat.3SG
‘What does he eat?’

b. Il mange quoi?
He eat.3SG what
‘What does he eat? (Lit. He eats what?)’

Another possibility, somewhat in line with Merchant (2003), would be to have TP-deletion first, which would result in (9c), an illicit construction.⁴ If ‘ce que’ is the remnant that remains in CP, this might result in some kind of a “crash” that is to be avoided. This could in theory trigger deletion of this element, but there would still presumably be a [+WH] feature (viz. Merchant 2003) as a wh-remnant is required. In order to fill this [+WH] feature requirement, we may have insertion of forms such as ‘quoi’ (as in 9a above). However, this would imply that this strong feature does not allow sluicing by feature movement alone, but that a strong feature somehow prompts the insertion of a wh-word. It is possible that ‘ce que’ is unable to eliminate/check the aforementioned feature.

³ Here I am postulating a possible structural constraint, not a phonological one.
⁴ Merchant (2003) has suggested alternative ordering specifically for sluicing COMP-generalization puzzles.
Alternatively, the non-elliptical form could simply be derived via a different mechanism, and sluicing in French involves an embedded in situ question alone.

(12) a. Jean voit quelqu’un, mais je ne sais pas qui_i
    Jean see.3SG someone but I NEG know not who
    <Jean voit qui_i>.
    Jean see.3SG
    ‘John sees someone, but I don’t know who_i <John sees who_i>.’

Recall that although the non-elliptical version in English (see the translation in 12) looks like the sluiced form on the surface, a movement-analysis would claim that the ellipsis site contains an embedded question with the wh-word in its base (in situ) position.

3 Previous Research on Sluicing in Child Language

Most acquisition studies on sluicing have been on comprehension. I will briefly overview these studies and their findings, before discussing what is known about children’s production. Wood (2009) conducted a study with English-speaking children ages 4;05-7;08 on their knowledge of sluicing. He found that while the children older than 6;08 accepted the sluices (and non-elided controls), the younger children (ages 4;05-5;05) not only rejected the sluices, but the control items as well. This makes interpreting the results slightly difficult, as the non-elided constructions were not intended to pose a problem for the children. Another study that addresses sluicing is Sugisaki (2016), with Japanese-speaking children (ages 4;07-6;06). This study examined children’s knowledge regarding the ban on voice mismatches. Sluices do not allow for voice mismatches (see 13, from Sugisaki). This contrasts with examples of VPE, where mismatches are grammatical (cf. Kehler 2000; Merchant 2013 and references within). These children indicated that they were aware of this ban and performed well.

(13) *Someone hired Joe, but we do not know by whom <Joe was hired>.

Lindenbergh et al. (2015) conducted a comprehension and elicitation study on Dutch children’s (4;09-6;01) knowledge of sluicing in different conditions (e.g. with and without negation). Children provided the target response more often than

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5 Mismatches with sluices are not allowed because sluicing involves TP-ellipsis, and the assumption is that there is no way to achieve identity without a VoiceP (Stowell, personal communication.; Merchant 2013).
not (average 90% for all conditions) in the comprehension task and, surprisingly, Lindenbergh et al. (2015) also elicited sluices from the children 63% of the time.

The previous studies, therefore, provide a mixed picture. The children in Sugisaki (2016) and Lindenbergh et al. (2015) indicate that children understand sluicing (or at least certain restrictions on sluicing) from as young as 4 years. Wood (2009), however, finds only children around 6 years-old are able to comprehend sluicing (which would imply that sluicing is acquired rather late in development).

Lindenbergh et al. (2015) looked at elicited production alone (presumably because sluicing is not expected to be common in spontaneous speech), but Ginzburg & Kolliakou (2009) conducted a corpus-based approach on sluices and non-sentential utterances. They report that about 33% of wh-questions (produced by adults) in the British National Corpus (BNC) were sluices, of the form in (14, from (4b) in G&K).

(14) Caroline: I’m leaving this school.
Lyne: When?

Ginzburg & Kolliakou then compared child-directed speech (CDS) to children’s production of such sluices, relying on the Manchester corpus from CHILDES (Theakston et al. 2001; MacWhinney 2000). Ginzburg & Kolliakou (2009) report low numbers of non-sentential questions, or sluices, for parents in this corpus, but fewer sluices (n = 19 for children, ages 2;03-2;10). An overall number of sluices is not provided for adults (only averages for two conversations), however the number of sluices per parent ranges from 4 to 25. They also report that children produce more sentential questions than sluices. G&K interpret this as sluicing being acquired late(r) and, that non-sentential queries such as sluices are delayed. However, given the low numbers of sluices in adult discourse, it is unclear (i) if this is a fair comparison and (ii) if there really is a delay or if sluices are simply not well attested/represented in corpora (and rarity in production of course does not necessarily equate to lack of knowledge).

4 Corpus Study

For this study, we conducted a corpus-based analysis with the Leveillé corpus (Suppes et al. 1973), which contains longitudinal data from one French-speaking child, Philippe (2;01-3;03). For the purpose of this research, we loosely followed criteria found in Ginzburg & Kolliakou (G&K) (2009). We searched for wh-phrases (quoi/what, qui/who, comment/how, où/where, quand/when), and categorized each

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6 N.B. Ginzburg & Kolliakou (2009) adopt a dialogue-oriented constructionism, while I assume a generative approach.
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fragment question. We searched for wh-phrases in context; we included the tier above and below the wh-interrogative in question (with more tiers if there were ambiguity). This is important not only in categorizing the “type” of sluice, but also in establishing that children produce sluices whose meaning is recoverable (as recoverability is a necessary component of sluicing, see Section 2).

The first category is what they refer to as a “direct” sluice; in this case, the one producing the sluice understands the antecedent of the sluice, but is asking for more information (G&K: 646). The following example (15) comes from Philippe (file 13).

(15) MOT: Tu joues.
     you.2SG play.2SG
     ‘You’re playing?’

     CHI: Avec quoi?
          with what
     ‘With what?’

     In example (15), Phillippe is presumably asking about the (unspoken) direct object, i.e. the object he is playing with; his response is, thus, seemingly felicitous within the discourse. The response with the elided material would resemble either (16a) or (16b), as both fronted and wh-in situ questions are possible in French.

(16) a. <Je joue> avec quoi ?
     I play.1SG with what
     ‘I am playing with what?’

     b. Avec quoi <je joue> ?
     with what I play.1SG
     ‘With what am I playing?’

     The second category is a “reprise” sluice, where the person producing the fragment question is unable to comprehend a part of the antecedent, which had been presupposed (G&K: 647). An example from Philippe is found in (17) from file 26.
Here Philippe is arguably unsure of part of the antecedent, in that he does not know the location of the snow (or the lack thereof). The sluice is, again, recoverable given discourse context. Philippe is asking about the snow mentioned in the preceding line by another child. The non-elided counterpart would be (18). The difference between these two types is subtle, and the categories will eventually be collapsed.

Another category Ginzburg & Kolliakou (2009) rely on is referred to as “repetition”. As the name suggests, this kind of sluice serves to ask for a repetition of the previous phrase. G&K (2009) collapsed the types of sluicing in the data reported (at least for some of the children), so it is difficult to determine how many of their sluices belong to each category. Nevertheless, we argue that this category is difficult to reliably define with consistency, especially in child language. There are a few clear cut instances of what might count as a repetition (as in 19 below); the elided information, in this case, could presumably be something like (20).
(20) <Tu dis> quoi?
you say.2SG what
‘You said what?’

However, several examples from the corpus proved to be problematic, in that it was
difficult to determine if the speaker was truly asking for a repetition, or if he or she
did not understand what was said (or perhaps why it was said). In these particular
cases, it was impossible to determine what exactly would be the elided constituent.
For this reason, these repetition sluices were discarded from the analysis here. We
also did not include fragment questions that were (seemingly) functioning to simply
confirm/clarify a previous utterance, for much the same reason.

We categorized each of Philippe’s fragment questions per wh-word, and the
same procedure (described above) was followed for the MOT (mother) tiers, in
order to compare the input that he receives to his output. For comparison, we also
searched for full wh-questions produced by Philippe and his mother, to determine
the proportion of sluices to full wh-questions.

Here an important note must be made. As mentioned, French allows for both
fronted wh-questions and wh-in situ; this might initially seem that French could be
problematic in determining if children’s sluices actually involve movement and
deletion, or if they actually support the non-structural approach (viz. Culicover &
Jackendoff 2005). However, there is reason to believe that the sluices in this corpus
may be generated by movement. First, while wh-in situ is an option, Crisma (1992)
reports that Philippe produces only a single token of an in situ question between
age 2;02 and 2;03 and even between 2;06 to 2;07, he produces wh-in situ less than
half of the time. In either case, wh-in situ questions are argued to involve covert
movement of the wh-operator (see Aoun et al. 1981, among others).

In order to determine if there is any kind of correlation between the age at
which Philippe produces his first fragment questions and his first full wh-questions,
we compared his production of both, per wh-word. The only theory discussed (see
Section 2) that would predict a delay between full questions and sluices/fragment
questions would be the Move-and-Delete analysis viz. Merchant (2001 et seq.). The
hypothesis is if movement is pivotal in sluicing (and in acquiring sluicing) there
should be a delay between full questions, which require movement – be it overt or
covert in nature — and fragment questions.

4.1 Results

The total number of “direct” sluices, per wh-word, along with the age at which the
first token is produced by Philippe, is reported in Table 1 below. While sluices are
uncommon, as might be expected, they are attested in this corpus. In an attempt to
be consistent, this table includes only sluices of the fragment question-type. That is, Philippe does produce some sluices that are sentential (more than fragments), as in (21) — but these are not in the table.

(21) Je sais pas où.
    I know.1SG not where
    ‘I do not know where.’

Table 1. Child Production by Sluice Type

<table>
<thead>
<tr>
<th>Wh-Word</th>
<th># Direct Sluices (DS)</th>
<th>Age of First DS</th>
<th># Reprise Sluices (RS)</th>
<th>Age of First RS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quoi?</td>
<td>13</td>
<td>2;06</td>
<td>10</td>
<td>2;06</td>
</tr>
<tr>
<td>Quand</td>
<td>0</td>
<td>--</td>
<td>0</td>
<td>--</td>
</tr>
<tr>
<td>Où</td>
<td>5</td>
<td>2;06</td>
<td>10</td>
<td>2;11</td>
</tr>
<tr>
<td>Comment</td>
<td>2</td>
<td>3;00</td>
<td>0</td>
<td>--</td>
</tr>
<tr>
<td>Qui</td>
<td>0</td>
<td>--</td>
<td>0</td>
<td>--</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>20</strong></td>
<td><strong>--</strong></td>
<td><strong>20</strong></td>
<td><strong>--</strong></td>
</tr>
</tbody>
</table>

Table 2 shows the comparison of sluices (of both types, collapsed) and full wh-questions

Table 2. Sluicing vs. Full Wh-Questions (Child)

<table>
<thead>
<tr>
<th>Wh-Word</th>
<th>All Sluices</th>
<th>Age of First Sluice</th>
<th>Full WH</th>
<th>Age of First Full WH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quoi</td>
<td>23</td>
<td>2;06</td>
<td>201</td>
<td>2;02</td>
</tr>
<tr>
<td>Quand</td>
<td>0</td>
<td>--</td>
<td>9</td>
<td>2;08</td>
</tr>
<tr>
<td>Où</td>
<td>15</td>
<td>2;06</td>
<td>212</td>
<td>2;01</td>
</tr>
<tr>
<td>Comment</td>
<td>2</td>
<td>3;00</td>
<td>82</td>
<td>2;01</td>
</tr>
<tr>
<td>Qui</td>
<td>0</td>
<td>--</td>
<td>45</td>
<td>2;02</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>40 (7%)</strong></td>
<td><strong>549</strong></td>
<td><strong>--</strong></td>
<td></td>
</tr>
</tbody>
</table>

7 This wh-word is the in-situ form. The fronted form - *qu’est-ce que/qui* ‘what’- is not found in fragment questions. For this reason alone, we did not include these forms in the totals. However, Philippe does produce fronted questions with ‘what’ as young as 2;01 (again supporting the idea that Philippe has acquired movement at this point).

We did include forms like *avec quoi* (‘with what’) that have a preposition; these can be used in fragment questions.
As illustrated, Philippe produces full, sentential wh-questions before he produces any sluices. If his production of sluices is collapsed in with his full wh-questions, these sluices constitute 7% of his production of wh-questions. However, this small percentage does not indicate that Philippe has not yet acquired sluices (and of course rarity in production crucially does not indicate a lack of knowledge).

In fact, if we consider adult production in Table 3, we see that adults also produce very few fragment questions. The mother is producing a higher rate of sluices than Philippe, but this seems to be an artifact of the low number of all wh-questions produced by her.

<table>
<thead>
<tr>
<th>Wh-Word</th>
<th># DS</th>
<th># RS</th>
<th>All Sluices</th>
<th>All Full WH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quoi</td>
<td>2</td>
<td>11</td>
<td>13</td>
<td>46</td>
</tr>
<tr>
<td>Quand</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Où</td>
<td>11</td>
<td>11</td>
<td>22</td>
<td>127</td>
</tr>
<tr>
<td>Comment</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>88</td>
</tr>
<tr>
<td>Qui</td>
<td>4</td>
<td>5</td>
<td>9</td>
<td>69</td>
</tr>
<tr>
<td>TOTAL</td>
<td>22</td>
<td>28</td>
<td>50 (13%)</td>
<td>336</td>
</tr>
</tbody>
</table>

4.2 Discussion

The research here highlights several points; first, these results indicate that French children are capable of producing sluices in the form of fragment questions from as young as 2;06. Second, although Ginsburg & Kolliakou (2009) report that sluices are relatively absent from children’s production, the research here (albeit from one child) suggests that (i) this might be slightly misleading if fragment questions (and not all types of queries) are compared to full wh-questions, and most importantly (ii) sluicing is rare in both child and adult grammar. Clearly, no one would claim that adults are incapable of producing sluices — fragment questions or otherwise — so it is important to point out that this phenomenon may simply be rare in spontaneous production. Third, there is a directionality in production, as is seen in Table 2. There is a delay (from 4 to 11 months, depending on the wh-word) between production of full wh-questions and fragment questions. This could suggest that children acquire movement before they are able to acquire sluicing. If movement of the wh-word is not required in sluicing viz. Merchant, this pattern is difficult to explain. In other words, the data here seems to at least support a theory in which movement is involved.
However, there are important caveats that must be stressed. Although corpus-data can be illuminating, it does come with particular restrictions. The child in this corpus is not prompted in any way to produce sluices (of any kind); the sluices that are found are those that happened to be produced during the course of naturalistic conversations. Nothing could be controlled for, as opposed to elicited production experiments (see Lindenbergh et al. 2015). Another potential concern is that Philippe is exposed to more full wh-questions than fragment questions; this may be argued to influence these results. While this is of course a valid concern, there is at least some reason to doubt such an input-driven explanation; for instance, there are phenomena that children acquire early with very little input (e.g. fronting the right auxiliary in polar-questions, see Reali & Christiansen 2005). Nevertheless, this point is well taken, which is why experimental data is needed going forward.

5 Conclusions and Directions for Future Research

In order to further explore if there is a trajectory in development, and if children are able to pick up on “invisible structure,” experimental studies are critical. This will also allow us to go beyond fragment questions and address other types of sluices in child French. It must also be determined that children’s production is in line with their comprehension. To this end, we plan to conduct elicitation and comprehension experiments in line with Lindenbergh et al. (2015); if the results obtained indicate that French children produce sluices when prompted, and understand sluices, this would provide support for the results here. If, on the other hand, we find that children struggle with sluices at an early age (viz. Wood 2009), this could indicate that early fragment questions are not analyzed as sluices (or perhaps should not be categorized as such) in child grammar. Regardless, the results of this corpus-based analysis offer insight into sluicing in spontaneous production in child language, and importantly function as a starting point off of which to build.

References


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