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The Identity of Silence: Acquiring the Identity Condition on Sluicing*

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Abstract

A fundamental issue in research on ellipsis is the identity condition which must hold between elided material and its antecedent in order for ellipsis to be licensed. This debate is of particular significance in the case of sluicing – the ellipsis of an IP – since there are many attested examples that challenge the traditional definition of identity in structural terms, suggesting alternative semantic and processing approaches. This paper considers the identity condition on sluicing from an acquisition perspective, testing young children’s knowledge of sluicing and the licensing conditions upon it. Using a Grammaticality Judgement task, it is shown that the youngest children (average age 4;10) reject sluicing as ungrammatical, whereas the older group (average age 7;2) judge sentences the same way as adult controls. Given that the youngest children also reject non-sluiced control sentences, the paper concludes that their initial difficulty stems from their having not fully acquired embedded questions.

1. Introduction

Since Ross (1969) first described IP ellipsis, the operation has come to be known as sluicing, the name which he originally coined for the transformational rule by which he accounted for the phenomenon. Sluicing results in a *wh*-phrase appearing in isolation in a position where a full constituent question is expected, as illustrated in the sentences in (1), which are synonymous with their full counterparts in (2).

- (1) a. Somebody sent John a green hat, but I don’t know [who].
 b. A: Somebody visited today. B: Really? [Who?]
 c. The woman is painting, but it’s not clear [what].
 d. Sarah is going shopping, but I can’t imagine [with whom].
- (2) a. Somebody sent John a green hat, but I don’t know [who *t* sent John a green hat].
 b. A: Someone visited today. B: Really? [Who *t* visited today?]
 c. The woman is painting, but it’s not clear [what the woman is painting *t*].
 d. Sarah is going shopping, but I can’t imagine [with whom Sarah is going shopping *t*].

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The isolated *wh*-phrases in (1) – which I shall refer to as *sluices* – represent incomplete sentences that rely on the context for their interpretation. Three possible relationships may hold between the *sluice-wh* – the term I shall use for the *wh*-word within the sluice¹ – and the context. First, the *sluice-wh* may have an overt correlate (argument or adjunct) in the surrounding linguistic structure, as in (1a) and (1b). The latter of these examples also shows that sluices can range over more than one sentence for their interpretation. Second, the *sluice-wh* may correspond to an argument which is not overtly expressed in the surrounding structure. For example, in (1c), where ‘what’ refers to the picture, landscape, door, *etc.* that is being painted: a possible argument of *to paint* in the preceding clause, but one that is not overtly expressed. Third, the *sluice-wh* may be an adjunct that has no linguistic correlate in the antecedent clause, as shown in (1d).

Following Ross’s (1969) initial description, sluicing has received a considerable amount of theoretical attention, with a number of analyses proposed in the literature. It is now almost universally accepted that the sluice is best analysed as a CP, with a range of evidence supporting this position; see Merchant (2001), for a good overview. The structure *within* this CP has been the subject of more recent debate, with two key positions having been advanced.

First, there are approaches based on movement, like Ross’s original (1969) proposal and the more recent work of Merchant (2001). On such approaches, the embedded *wh*-clause that becomes the *sluice-wh* is initially generated in full. The *wh*-word moves to SpecCP of the matrix clause, as in the formation of standard *wh*-questions, before a sluicing rule deletes the remainder of the embedded clause (that is, the embedded IP, and any structure lower than it). The deletion itself has been stated a number of ways, ranging from deletion proper (Ross 1969) to the IP being flagged for non-pronunciation at PF (Merchant 2001). The specifics of this need not concern us here, what is important is that it comes to be not overtly realised.

The second group of analyses does not implicate movement. Under such approaches, of which perhaps the best known example is Chung *et al.* (1995), the full *wh*-question is not present in the syntactic derivation. Instead, operations are posited at the level of interpretation, LF. These result in the sluiced IP being replaced by copying from the surrounding linguistic structure, and thus allow the sluiced material to be recovered and successfully interpreted.

Proponents of deletion accounts have pointed to connectivity effects – such as the fact that the *sluice-wh* bears the same case as it would in an equivalent non-sluiced sentence – in support of involving the full structure in the syntactic derivation of sluices. More specifically, they argue that the full structure must be present at some stage of the derivation in order for the observed case to have been assigned as it would in the non-sluiced counterpart sentence.

Evidence in favour of interpretive approaches that do not implicate movement comes from consideration of traditional island constraints (Ross 1967) that prevent *wh*-words moving out of islands. This is exemplified in (3), where the lowest NP is an island from which extraction is illicit (the specifics of this are not important for present purposes; see Corver (1990) for more details). Sluicing such sentences appears to make them (at least more) acceptable, as (4) illustrates (examples from Merchant (2001)). This fact is clearly problematic on deletion approaches: island violations will occur at some stage of the derivation. Merchant’s (2001) work has been very influential in

¹A number of other terms are used in the literature, but I use *sluice-wh* to avoid unintentional association with any particular theory.

accounting for this difficulty, leading to deletion becoming the theory of choice in most recent work.

- (3) * He wants a detailed list, but I don't know $[[_{\text{DegP}}\text{how detailed}]_i$ he wants $[t_i$ a list]].
- (4) He wants a list, but I don't know $[_{\text{DegP}}\text{how detailed}]$.

Despite the considerable amount of theoretical work on sluicing, almost no work has investigated it experimentally, or from an acquisition perspective. This is surprising, since sluicing is far more widespread cross-linguistically than other types of ellipsis, that *have* been investigated by acquisitionists (see work on VP ellipsis by Thornton & Wexler (1999), and Matsuo & Duffield (2001)). The present paper begins to address this gap, by considering children's acquisition of sluicing. Specifically, it considers their knowledge of the constraints that license a structure to be sluiced.

2. Theoretical Background

Thus far, we have considered the basics of sluicing and adopted a possible analysis. But what makes it possible to sluice an embedded sentence in the first place? Of course, it needs to be a *wh*-question, but that alone is not sufficient, as (5) shows.

- (5) a. The ball is bouncing but I can't imagine who is bouncing it.
 b. * The ball is bouncing but I can't imagine who.

The licensing requirements on ellipsis have long been of central concern to those studying it. Traditionally, licensing has been defined in structural terms, following Hankamer & Sag (1976) and Sag & Hankamer (1984). In these terms, elided – for our purposes, sluiced – material must have a structurally parallel (identical) antecedent. Take, for example, the sentence in (2a). There, '*t* sent John a green hat' is structurally identical to 'Somebody sent John a green hat,' and this fact permits it to be sluiced.

Whilst this theory works for many cases, it has often been necessary for it to be supplemented with some notion of sloppy identity (the term used to describe the identity that holds in cases without perfect isomorphism of structure which are nevertheless acceptable). Such notions, though, have never been entirely satisfactory, struggling to account for apparently quite basic cases of sluicing, as can be seen in (6), where a gerund in the antecedent corresponds to an infinitive in the sluice.

- (6) Decorating for the holidays is easy if you know how!
 a. \neq * ...how [decorating for the holidays]
 b. = ...how [to decorate for the holidays].

Noting this and other cases of difficulty for structural isomorphism, Merchant (1999, 2001, 2005) attempts to redefine the identity condition that licenses sluicing in semantic terms. Following Schwarzschild (1999), he defines a condition in terms of eGivenness, essentially requiring a bidirectional entailment to hold between the elided and antecedent material. Replacing the relevant parts of (6) with semantic representations as in (7), Merchant's theory correctly predicts its grammaticality: the ellipsis and its antecedent are semantically identical.

- (7) $[\exists x.\text{decorate for the holidays}(x)]$ is easy if you know how!
a. $\neq *$...how [decorating for the holidays]
b. = ...how $[\exists x.\text{decorate for the holidays}(x)]$.

This approach also correctly rules out ungrammatical sluices. Take sentence (8), for example (from Merchant (2001)), which is a grammatical sluice of (8a), but not of (8b). Replacing the relevant parts of these sentences with their semantic representations (as in (9)) reveals why this is the case: insulting someone does not entail calling them an idiot, and so the bidirectional entailment requirement of eGivenness is not satisfied.

- (8) I know she called some politician an idiot, but I don't know which.
a. = ...but I don't know which (politician) she called an idiot.
b. $\neq *$...but I don't know which (politician) she insulted.
- (9) I know $[\exists x.\text{she called } x \text{ an idiot}]$, but I don't know which.
a. = ...but I don't know which (politician) $[\exists x.\text{she called } x \text{ an idiot}]$.
b. $\neq *$...but I don't know which (politician) $[\exists x.\text{she insulted } x]$.

The semantic approach, then, deals more elegantly with those cases which required us to submit to sloppy identity on the original structural approach, but we should note at this point that it in itself is not a perfect solution. There are examples which Merchant's semantic approach incorrectly predicts to be grammatical. One such case is exemplified by (10), where we find a voice mismatch between the sluiced material and its antecedent.

- (10) * Peter was murdered, but we don't know who ~~murdered Peter~~.

Such cases are discussed by Chung (2006), who proposes an additional rule to supplement Merchant's eGivenness constraints. In fact, Merchant himself has recently proposed a revision to his initial theory, reverting to syntax to explain the licensing constraint (Merchant 2006). Since these cases are exceptions to Merchant's rule, and the revisions still admit those cases I treat as semantic in this paper, I shall not discuss these cases in detail here; the reader is referred to the works cited for further information, and I turn instead to the acquisition issues presented by ellipsis, particularly sluicing.

3. Acquisition issues

As noted above, acquisitionists interested in ellipsis have traditionally investigated VP ellipsis (see, for example, Guo *et al.* 1996, Foley *et al.* 1997, Postman *et al.* 1997, Thornton and Wexler 1999, Matsuo and Duffield 2001, Duffield and Matsuo 2009). Moreover, most work on VP ellipsis has studied English, since VP ellipsis is far from universal cross-linguistically. Santos (2006) notes, for example, that VP ellipsis is licensed in Portuguese and English but not in French or Spanish, and for other languages, like Japanese, the question is even less clear cut (cf. Otani and Whitman (1991) and Hoji (1998)).

Sluicing, on the other hand, is found in every language studied thus far, and may even be universal (Merchant 2001). For this reason, it potentially holds the key to mediating between debates in the literature, such as the definition of the identity

condition. This is so in at least two ways. First, studying another type of ellipsis provides another perspective on the phenomenon, making comparisons *within* languages possible, and leading to better understanding of the grammar underlying ellipsis as a whole. Second, studying sluicing opens up ellipsis research – and especially acquisition research on ellipsis – to a much broader dataset, because more languages can provide data for study. Comparisons *across* languages will therefore be made more feasible.

A good example of the benefit of cross-linguistic data to the wider theory as well as to work on acquisition comes from Duffield and Matsuo's paper (2009). In light of Frazier *et al.* (1984) and Frazier *et al.* (2000), they initially propose on the basis of English data that identity conditions may in fact be better explained in terms of parsing preferences. However, their cross-linguistic results revealed an apparent variation in the strength of the parallelism constraint across languages. Such a finding makes a processing account less attractive, since cross-linguistic variation is not expected – and is difficult to account for – on such an approach. This illustrates the value of cross-linguistic data in arbitrating between theories, but also underlines the importance of experimental work to support theoretical considerations.

Studying ellipsis is also valuable for acquisitionists in ways that extend beyond refining and developing theories. Since ellipsis represents a breakdown of the fundamental role of syntax as a link between form and meaning, a child trying to comprehend an elided construction must first build a syntactic representation of the surface form, and then reconstruct the elided material to create a complete interpretation. Because of this element of reconstruction, the grammaticality of an ellipsis cannot be determined from the surface form alone, making ellipsis an interface phenomenon that draws on semantics, pragmatics and processing strategies (see Matsuo and Duffield 2001, for a discussion of this). We can therefore use ellipsis as a way of studying the ways that these systems interact in child language development.

Finally, interesting learnability problems arise with elided constructions – at least as far as identity constraints are concerned – because the judgements involved are often not categorical. That is, violations of parallelism between elided material and its antecedent are not ungrammatical in the sense that violations of true syntactic constraints like binding theory are. This accounts for violations of parallelism which can be found in everyday speech, as has been noted by Hardt (1993), and exemplified in (11).

- (11)a. A lot of this material can be presented in a fairly informal and accessible fashion, and often I do. (Chomsky 1982, cited in Dalrymple *et al.* (1991))
 b. The ice cream should be taken out of the freezer, if you can.

Given that violations such as these are to be found in everyday speech, and because parallelism is a negative constraint (Crain 1991), a learnability problem arises for children. Negative constraints are taken to be open to being overridden on the basis of positive evidence. Moreover, it is assumed by acquisitionists that negative evidence – that is evidence about what is *not* grammatical or acceptable – is not available to children. The child is therefore left in a difficult position, with conflicting evidence about the status of the identity condition, and whether or not it is a requirement for ellipsis to be licit. Furthermore, as mentioned in the introduction above, sluicing is able to ameliorate island violations. This has interesting consequences for considerations of

the role of Universal Grammar in language acquisition, because unless children distinguish sluiced and non-sluiced constructions early in development, a learnability problem arises as far as islands are concerned. Sluiced sentences will provide evidence against island constraints, whilst non-sluiced sentences provide positive evidence for island constraints. At best, then, a child who does not distinguish elided contexts and attribute the lack of island effects to the elided construction might assume that island constraints do not always hold.

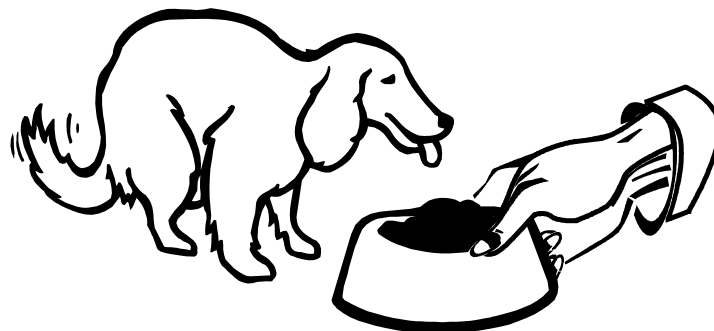
Aside from the value of studying the acquisition of sluicing for its contribution to research on ellipsis and sluicing itself, then, it provides an interesting approach to more general acquisition questions.

4. Experimental methodology

In order to investigate what children know about sluicing – and particularly the conditions that license it – I devised a Grammaticality Judgement Task (GJT; see McDaniel and Cairns 1996). The task was based on pictures, and I employed a modification to the original GJT – using a puppet – first introduced by Hiramatsu & LilloMartin (1998). Participants were initially briefed that the puppet (either a mole or an owl, at each participant’s choice) comes from the moon, where he speaks ‘moontalk.’ It is explained that this does not sound like English, and he cannot therefore be understood by people on Earth. Because he wants to come to Earth for holidays, the puppet is trying to learn English. The participant is asked to help him, by tickling his ‘hand’ to indicate when he says something in ‘good’ English, and his nose to indicate when he says something silly. In this way, we could infer whether or not the child accepted each stimulus as grammatical, whilst ensuring that the child did not feel that he or she was being tested. Using the puppet also helped to make the test session more interactive and enjoyable for the child.

To provide stimuli, pictures, like that in *Figure 1* – except in full-colour and A4-sized – were presented to the puppet, but kept hidden from the participant. The puppet, controlled by the first experimenter, described what he could see to a second experimenter, who was holding the picture.

Figure 1: Example stimuli from GJT



For *Figure 1*, for example, the puppet would say: ‘Oh, look, there’s a dog and I think he is hungry. A man I’ve never seen before is giving him food.’ Next, the puppet turned to the participant and uttered the target sentence: ‘I can say something about this picture! Somebody is feeding the dog, but I don’t know who.’ The participant then responded by

tickling the puppet. A training phase ensured that little prompting of the participant was necessary to get him or her to respond to the test sentence, but where the child did not respond after a few seconds, the sentence and/or the context was repeated once more. Crucially, the pictures were not revealed to the participant until after he or she had judged the puppet's utterance. This was a modification introduced after a small number of pilot trials, in which children who could see the picture tended to give truth-value, rather than grammaticality judgements. Hiding the pictures until after the child gave a judgement eliminated this problem.

It was planned that all test sessions would begin with a short training phase to check that the children understood the task. This section presented simple objects and the puppet gave single-word utterances, for example 'berrystraw' with a picture of a strawberry. In fact, all of the youngest children scored 100% target responses on this task, so it was omitted with the older group, who instead started with the pre-test phase.

For pre-testing, a mixture of clearly grammatical and clearly ungrammatical sentences was presented, testing phenomena generally accepted to be acquired by the age of the children involved. For example, one picture presented a boy riding a bike, with the stimulus sentence: 'The is riding bike boy.' Ten such sentences were presented to each child, and children scoring less than 80% were excluded from the study, on the grounds that they had failed to understand the task.

The trials themselves were equally divided across five different types of sluiced sentences, each of which tested a different sluice-antecedent relationship. First, there were sentences like (12), which have structurally parallel antecedents. These sentences satisfy the identity condition stated in terms of structural isomorphism, but can also be accounted for using Merchant's semantic approach. Contrastingly, the second type, like (13), had semantically related antecedents. These sentences satisfy Merchant's eGivenness definition of identity, but cannot be accounted for in traditional syntactic isomorphism terms. Third, I tested sentences in which the antecedent contained no overt correlate to the sluice-*wh*, as in (14). Notice here that 'where' refers to the place of hiding, but the antecedent clause does not mention this place, hence there is no overt correlate to the sluice-*wh*. Fourth, there were sentences in which the sluices had no antecedent at all, making them ungrammatical, as in (15). Finally, I ran control sentences which could have been grammatically sluiced, but which were presented in full, like (16).

- (12) *Structural antecedent:*
Somebody is feeding the dog, but I don't know who.
- (13) *Semantic antecedent:*
The mouse is playing tennis, but it doesn't know how.
- (14) *Antecedent with no overt correlate:*
The boy is hiding, and I know where.
- (15) *No antecedent (ungrammatical):*
* The ball is bouncing, but I don't know who.
- (16) *Full structure not sluiced (control):*
Somebody is painting a picture, but I don't know who is painting a picture.

I prepared two versions of the test, each containing two different sentences of each type. Each participant heard one version and so responded to two sentences of each type. The sentences were further divided for polarity, so that half were negative and half affirmative. The order of the trials was varied across the versions to control for any ordering effects cueing participants' judgements, and the test sentences were split up with simple sentences like those used in the pre-test, to avoid participants noticing any patterns.

All participants were native English-speaking monolinguals, and were divided into three groups: 4;5-5;5-year-old children (n=21); 6;8-7;8-year-old children (n=18); and adult controls (n=14). The children were recruited from a state infant school in Sheffield, and the adults were all first-year undergraduate students. All participants, or their parents in the case of children, signed consent forms after receiving written information about the task, and no participants received any payment for their participation.

5. Results

The prediction was that adults – and children who had full adult competence with sluicing – would accept all of the sentences as grammatical, with the exception of those like (15) where the sluice had no antecedent. On this basis, results were recorded as target or non-target responses. Runner (2002) notes that, in cases where semantics is involved in determining whether sluicing is licensed, some individual speaker variability may arise in more marginal cases, such as (4) above, where judgements depend on whether or not one considers wanting a list to entail wanting a detailed list. I deliberately tried to make the sentences as clear-cut as possible, so that judgements should be fairly categorical for those with adult-like competence with the constructions involved. However, were the different antecedent types to attract different response patterns, I predicted that sentences with semantic antecedents should attract lower target response rates than sentences with structural antecedents, because in cases of structural isomorphism, the semantic conditions will also be satisfied. Conversely, I did not predict that there would be any significant effect of version or polarity (that is, there would be no significant effects due to presentation order or variation between affirmative and negative sluices).

Table 1: Summary results of GJT as percentages of target responses

Antecedent type	Children 4;5-5;5 (n=16)	Children 6;8=7;8 (n=18)	Adult controls (n=14)
Structural	50	94	96
Semantic	60	88	68
No overt correlate	48	94	79
No-antecedent	70	94	100
Full structure (control)	65	96	98

The results recorded are presented as percentages of target responses in *Table 1*. Of the 21 children in the youngest group, five were excluded because they either failed

to pass the pre-test or they chose to leave the study before completing it.² None of the older children or adults was excluded.

As can be seen in *Table 1*, the youngest children did not perform in line with the prediction, with low target response rates at or close to chance. This is perhaps most surprising in the case of structural antecedents (50% target response rate), since these represent the most prototypical sluiced sentences, satisfying parallelism defined in either syntactic or semantic terms. The highest target response rate from young children was found when the sluice had no antecedent, and hence was ungrammatical, suggesting that the children have some sense of what is not grammatical, and must at the very least therefore have some conception of the fact that sluicing is not freely available but must be licensed. Perhaps most important for this group is the finding that even control sentences, which could have undergone sluicing but had not, attracted low target response rates. This suggests that what is at issue here may not be the licensing conditions at all, but rather the underlying embedded question construction may be the source of the difficulty.

To investigate the statistical significance of these results, I entered the data into a 4*2*2 (antecedent type*polarity*version) Repeated Measures ANOVA. This revealed a significant main effect of antecedent type ($F_{(3,42)} = 3.832, p = 0.039$), but no significant effects of version or polarity, nor any interactions. To isolate the source(s) of the variation within the antecedent types, I ran a series of paired T-tests, which revealed significant differences between sluices with no antecedent and sluices with structural antecedents ($t = 2.300, df = 15, p = 0.038, 2$ -tailed), and non-sluiced sentences *versus* structural antecedents ($t = 2.449, df = 15, p = 0.027, 2$ -tailed). These results support the comments above; children in the youngest group show statistically significant differences where adults would not be predicted to, whilst showing some knowledge of a requirement for ellipsis to be licensed. They are better at judging non-sluiced sentences – albeit not with adult-like competence – and at this stage therefore seem to have a weak preference for sentences that are not sluiced.

The older children, in the 6;8-7;8 age range, performed much more in line with my predictions. Their response rates appear above chance, and they have no problem with the full underlying structure, as their 96% acceptance of non-sluiced sentences reveals (the fact that this is less than 100% is attributable to one participant). There is no difference in response pattern for children in this group between structural antecedents and cases with no antecedent, with both being rejected just 6% of the time. This indicates that children are fully confident with the licensing condition, recognising the unacceptability of sentences which do not satisfy it, and confidently accepting sentences which most prototypically satisfy it. Interestingly, their response pattern is the same for cases with no overt antecedent, which, despite the sluice-*wh* having a covert correlate in the antecedent, still satisfy structural parallelism. In line with the prediction that if any type of antecedent were less acceptable, it was likely to be semantic, 6;8-7;8 children rejected these 12% of the time – slightly more often than was the case with other types of antecedent. This points towards the speaker variability predicted by Runner (2002), in that entailments are, to an extent, open to interpretation.

The story is much the same for adult controls, with two surprises: the target response rates for both semantic antecedents and cases with no overt correlate were

²All such exclusions occurred on one particular day, when other unusual activities were happening in school. I attribute these distractions to the other activities, rather than any problem with the GJT.

relatively low, with 29% and 22% rejection rates respectively. Further analysis of the data for these two conditions suggests that this may be due to item effects. The low acceptance rate for semantic antecedents is accounted for by the fact that the sentence in (17) was rejected half of the times it was presented. It is not clear why this should be the case, because the parallel sentence (18) from version two of the test sentences did not cause any problems. My suggestion is that participants perhaps found a situation in which a teacher would tell a pupil what to write at odds with their expectations for a teacher's behaviour, and so rejected it for independent reasons.

A similar item effect appears to have influenced the result for sentences with no overt correlate, with the sentence in (19) causing problems. Notice that this sentence is ambiguous, meaning either that the speaker does not know where the drawing is taking place, or where the place is that the monkey is drawing a picture of. In fact, the former interpretation was intended, but I attribute the adults' high rejection rate for this sentence to this ambiguity.

(17) The boy will write when the teacher tells him what.

(18) The girl will draw when the boy shows her what.

(19) The monkey is drawing, but I don't know where.

In order to avoid the item effects noted above affecting the statistics, the results from the two trials affected were replaced with the mean response from the same trial type in the opposite version, prior to running the RM ANOVA. Mauchly's Test of Sphericity was significant, and so Multivariate Analysis is reported here, which showed no significant main effects (antecedent type $F_{(3,36)} = 3.231$, $p = 0.069$), nor any interactions, in line with my predictions. Of course, some caution is necessary in the interpretation of these results, given that they are based on corrected values. However, since adults behaved as predicted in one version of the task, since polarity and version had no effect anywhere else in the task, and since the sentence constructions were identical across both versions, I am reasonably confident that the corrected statistics represent the adults' knowledge better than the raw values. Further research and testing is, however, needed to confirm this.

6. Discussion

Overall, adults and the oldest children understood the constructions tested, accepting sluiced sentences 95% of the time overall, and, in the vast majority of cases, not showing any hesitation in doing so. This finding suggests that a semantic approach to the identity condition is on the right lines, at least for the most basic cases, since sentences which satisfied only this constraint were accepted. That said, semantic antecedents did attract the highest rejection rates, supporting Runner's (2002) suggestion that if semantics is involved in establishing identity, some variation in speaker acceptability judgements may arise (see section 5, above).

The youngest children gave consistently higher rejection rates and this is surprising for two reasons. First, it is traditionally assumed that young children are subject to a 'yes'-bias in experimental contexts. In situations where they are unsure, this bias will lead them to be overly accepting (although, see Fritzley & Lee (2003), who

suggest that by school age, children may actually exhibit an opposite ‘no’-bias). The fact that young children rejected sluiced sentences so frequently, then, may be taken as evidence of the strength of their belief that they are ungrammatical: they really think they are not acceptable.

Second, Matsuo & Duffield (2001) report that children of the age being tested here were sensitive to syntactic parallelism licensing other types of ellipsis. With no reason to doubt that finding, it would be odd to suggest that children show knowledge of parallelism licensing some types of ellipsis but not others, when adults are presumed to use the same licensing mechanism for all types. I think the significant finding in this regard is that young children were not entirely sure in their judgement of full non-sluiced sentences, which were essentially just embedded question structures. Note, however, that the statistics show these to be ahead of sluiced cases, being judged acceptable more often than not. It therefore seems likely that the youngest children’s problem with sluicing does not stem from sluicing *per se*, nor from its licensing conditions. Rather, it seems that children in their first year of school are not fully competent in processing embedded question structures of the type underlying the sluiced sentences I tested. Notice that without this underlying structure no licensing condition could ever make sluicing acceptable, because the children will have no way to recover the elided material and arrive at a full interpretation of the sluiced sentences.

The data from older children support this claim since they fully accept the embedded question structure and behave in line with adult predictions on sluicing trials. Given that no time lag is apparent between the acquisition of full – or at least near – adult competency with embedded questions and the emergence of adult-like judgements of sluicing, it seems probable that sluicing emerges at the same time as – or with very little delay after – embedded questions.

To investigate this further, and follow up on this work, it would be helpful to test children in the years between the two age groups tested here, since these age groups capture extremes: children with no knowledge of sluicing on the one hand, and children with adult-like competence on the other. The intermediate years must, then, be the time at which sluicing emerges in children’s language. In addition, I would also like to further investigate the gradability of speakers’ judgements regarding the acceptability of sluicing. I have noted above, following Runner (2002), that semantic identity creates fewer restrictions on speakers to give binary judgements than does a syntactically-defined condition. The test employed in this study forced binary judgements, with participants able to accept or reject sentences and their only way to indicate difficulty or lack of certainty was by telling the experimenter or by answering follow-up questions posed by the puppet. For present purposes, since this work represents an early study in a larger project and it is, to the best of my knowledge, the only study to look at the acquisition of sluicing in children, I do not think this limitation in methodology is overly problematic. However, it would be interesting to consider sentences based on semantic identity using a methodology that gave participants the opportunity to indicate their relative acceptability, rather than forcing them to categorise what they may feel are more marginal cases.

7. Summary

This study has shown that children in their first year of school are not fully competent in interpreting sentences with sluicing. I have attributed this finding to an

incomplete grasp of the underlying structure, rather than to the sluicing itself, for two reasons. First, children of the same age have been shown to possess the parallelism constraints – at least as defined syntactically – in other contexts. Second, the children did not display adult-like performance with sentences that could have undergone sluicing, but which had not. We saw that between the two age groups tested, the children make a leap, coming to behave as adults within the space of just over a year. We have seen that a semantic approach to the identity condition which underlies this ability does appear to at least be on the right lines, and pointed to further research which will help should reveal the details of that approach, and the course of its acquisition, in more detail.

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