

Successive Cyclic Movement and Island Repair: The Difference Between Sluicing and VP Ellipsis

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It is well known that in Sluicing constructions wh-dependencies can cross certain projections that are otherwise barriers to movement (Ross (1969), Chomsky (1972)). This fact would follow under the assumption that the relevant barriers are somehow deactivated when phonologically deleted ('island repair'). The problem, however, is that another form of phonological deletion (VP Ellipsis, VPE) seems to be impossible in certain contexts where Sluicing allows for island repair (Chung et al. (1995), Merchant (1999)).

Nevertheless, we argue against the conclusion that island repair is a special property of Sluicing. The argument is based on two observations. First, the difference between Sluicing and VPE seems too broad to warrant the conclusion that island repair is the distinguishing factor (Lasnik (2000)). Second, the conclusion is directly refuted by other VPE environments where island repair is possible (Kennedy and Merchant (2000), Fox (In preparation)). The argument leaves us with a puzzle that we attempt to resolve while still maintaining the null hypothesis that VPE and Sluicing involve the same operation of deletion, differing only in the size of the deleted constituent. Our proposed resolution capitalizes on a special property of the relevant Sluicing contexts, namely the presence of an indefinite NP in the antecedent clause in a parallel position to that of a trace in the elided clause. We argue that given the parallelism conditions on ellipsis, this fact prevents the wh-phrase in the elided clause from undergoing successive cyclic movement. The remaining option (one fell swoop movement) requires the deletion of all barriers, including those that would otherwise be circumvented via an intermediate landing-site. Such deletion occurs in Sluicing but not in VPE, which targets a smaller constituent.

1. An Apparent Repair Paradox

To the best of our knowledge, Ross (1969) was the first to observe island repair under Sluicing. Ross gives the following examples (marking the Sluicing versions with ??, though many speakers find them perfect or virtually so).

- (1) I believe the claim that he bit someone, but they don't know who (*I believe the claim that he bit) [Complex NP Constraint, noun complement]
- (2) Irv and someone were dancing together, but I don't know who (*Irv and were dancing together) [Coordinate Structure Constraint]
- (3) She kissed a man who bit one of my friends, but Tom doesn't realize which one of my friends (*she kissed a man who bit) [Complex NP Constraint, relative clause]
- (4) That he'll hire someone is possible, but I won't divulge who (*that he'll hire is possible) [Sentential Subject Constraint]

Chomsky (1972) presents a similar example, involving amelioration of extraction out of a noun complement (quite a weak violation for many speakers, but marked with * by Chomsky):

- (5)a (*?)I don't know which children he has plans to send to college
- b He has plans to send some of his children to college, but I don't know which ones

Much more recently, Chung et al. (1995) (CLM) give the following examples, among several others, to make the same point:

- (6) Sandy was trying to work out which students would be able to solve a certain problem, but she wouldn't tell us which one (?*she was trying to work out which students would be able to solve)
- (7) That certain countries would vote against the resolution has been widely reported, but I'm not sure which ones (*that \bar{t} would vote against the resolution has been widely reported)

Merchant (1999) provides an extensive survey of such cases, and presents scores of further examples, including such 'Left branch Condition' phenomena as the following:

- (8) He wants a detailed list, but I don't know how detailed (*he wants a \bar{t} list)

The phenomenon is clearly quite pervasive.

Kennedy and Merchant (2000) show that other ellipsis processes also sometimes repair island violations. For example, in comparative deletion constructions, VP ellipsis seems to alleviate Left Branch Condition effects:

(9) * [How interesting] did Brio write [a t novel]

(10)a Pico wrote a more interesting novel than Brio did

b Pico wrote a more interesting novel than [Op Brio did ~~write a t novel~~]

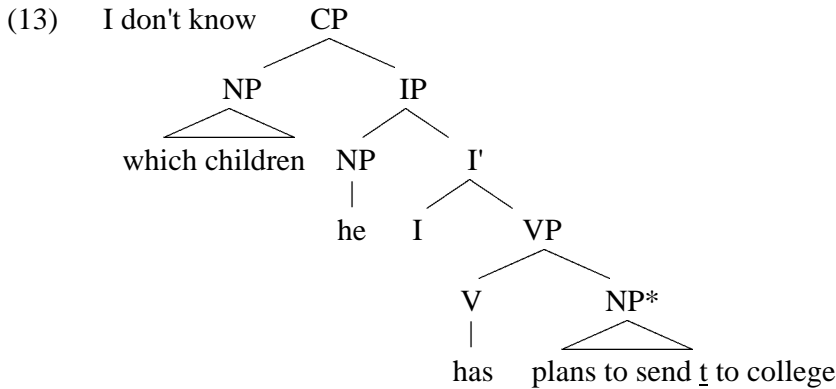
Additional evidence that island repair is also a property of VPE comes from a contrast discussed in Fox (In preparation). Consider the dialogues in (11) and (12), focusing on the utterance produced by speaker B.

(11) Speaker A: We should hire John since he knows how much every item in this store costs.
Speaker B: I think that's not necessary. ? I know how much every item costs that John does ~~knows how much t costs~~.

(12) Speaker A: We should hire John since he knows how much every item in this store costs.
Speaker B: I think that's not necessary. * I know how much every item costs that John knows how much t costs.

The relevant sentence in (11) is somewhat marginal. The reason for this marginality is that ACD resolution relies on long distance QR and extraposition (see Fox (2000a), Fox (In preparation) for details). But this is not particularly important from the current perspective. The important point is that the sentence is much better than expected if VPE could not repair islands. This is seen when we compare the sentence to its counterpart in (12) where the elided VP is pronounced. The latter is totally unacceptable, an expected consequence of subject extraction across a wh-island. (11), although slightly marginal, does not feel like a similar island violation, thereby suggesting that VPE is capable of island repair.¹

Thus, actual island repair by ellipsis seems to exist. Here is one (rather old) account. Chomsky (1972) suggests that * (# in his presentation) is assigned to an island when it is crossed by a movement operation. An output condition forbidding * in surface structures accounts for the deviance of standard island violations. Chomsky's analysis is illustrated in the following representation (put in more modern phrase structure terms):



If a later operation (Sluicing in this case) deletes a category containing the *-marked item, the derivation is salvaged.

A tempting alternative explanation at this point might be to deny that the 'repaired' sentences involve movement at all. Instead, they might involve a resumptive strategy, with the resumptive pronoun eliminated along with the rest of the IP or VP by ellipsis. Merchant (1999, p.237, pp.149-170) discusses a variety of problems with this approach. One problem arises from the observation of Haik (1987) that some island effects do show up in ACD constructions, as in (14) as compared with (15).²

(14) ?*Dulles suspected everyone Angleton wondered why Philby did

(15) Dulles suspected everyone Angleton said Philby did

CLM also present evidence that VP ellipsis does not remedy islands. They give the following example of extraction out of an adjunct, observing that VP ellipsis does not improve it:

(16) *What did you leave before they started playing t

(17) We left before they started playing party games. *What did you leave before they did?

CLM suggest that there might be a fundamental difference between Sluicing and VP ellipsis at work here, the former involving LF copying and the latter PF deletion. But that fails to address the puzzle that VPE sometimes (like Sluicing) does repair island violations but other times (unlike Sluicing) does not. A potential solution might capitalize on Chomsky's (1972) * deletion outlined above. In the Kennedy-Merchant example (10), the relevant island is presumably the NP which Op has moved out of (or some projection right above NP, as argued for by Kennedy and

Merchant). But note that the island is no longer present in surface form. The same is true of Fox's (11). On the other hand, in the CLM example (17) (and the Haik (1987) example (14)), the island is the adjunct phrase headed by before (or the wh-island), and that phrase remains in surface form. On the Chomsky (1972) account of the remediation of islands by Sluicing, that difference is significant, because on that account the * would be eliminated in (10), but would remain in (17) (and (14)).

However, such a solution initially does not seem general enough. In rejecting Chomsky's analysis, Merchant (1999) presents cases where the island is eliminated by VP ellipsis, but the example is nonetheless unacceptable, even though the corresponding Sluicing example is fine. For example, while in (19), we get apparent repair by Sluicing, in (20) VP ellipsis doesn't ameliorate the deviance.

- (18) *They want to hire someone who speaks a Balkan language, but I don't know which (Balkan language) [_{IP} they want to hire someone who speaks t]
- (19) They want to hire someone who speaks a Balkan language, but I don't know which (Balkan language) [_{IP} ~~they want to hire someone who speaks~~ t]
- (20) *They want to hire someone who speaks a Balkan language, but I don't know which (Balkan language) they do [_{VP} ~~want to hire someone who speaks~~ t]

Note that in (20), as in (19), the island that is crossed (the relative clause and/or the NP containing it) does not show up at the end of the derivation. If the marker of deviance is on the island, and if the island is deleted, Merchant reasons that there is no obvious way to capture the difference in status between (19) and (20). Partly for this reason, Merchant winds up arguing that relative clauses are LF islands, rather than PF islands, so their violation can't be repaired by a PF process (ellipsis = deletion). He then gives a completely different account of the apparent repair in (19), one where the derivation doesn't involve any island violation in the first place. However, it turns out that even for Merchant's PF islands, the problematic state of affairs still obtains. First, consider COMP-trace effects, as in the following two examples, which are fine with Sluicing but severely degraded without ellipsis.:

- (21) It appears that a certain senator will resign, but which senator [~~it appears that t will resign~~] is still a secret [adapted from Merchant p.219]
- (22) Sally asked if somebody was going to fail Syntax One, but I can't remember who [~~Sally asked if t was going to fail Syntax One~~] Merchant p.219, from CLM

Next, there are 'derived positions', including topicalized phrases and subjects. (23) and (24) illustrate Sluicing repairing a topic island violation and (25) illustrates Sluicing repairing a subject island violation.

- (23) *Which Marx brother did she say that [a biography of __], she refused to read?
- (24) A: A biography of one of the Marx brothers, she refused to read.
B: Which one? Merchant p.220
- (25) She said that a biography of one of the Marx brothers is going to be published this year, but I don't remember which [~~she said that a biography of t is going to be published this year~~] [adapted from Merchant p.220]

But contrary to expectation, we again find apparent failure of repair with VP ellipsis.

- (26) *It appears that a certain senator will resign, but which senator it does [~~appear that t will resign~~] is still a secret
- (27) *Sally asked if somebody was going to fail Syntax One, but I can't remember who she did [~~ask if t was going to fail Syntax One~~]
- (28) *She said that a biography of one of the Marx brothers is going to be published this year, but I don't remember which she did [~~say that a biography of t is going to be published this year~~]

Stranger still, parallel 'failure of repair' obtains even when there is no violation in the first place. Extraction out of an embedded clause is typically fine and Sluicing is just as good, but VP ellipsis is bad:

- (29) They said they heard about a Balkan language, but I don't know which Balkan language (they said they heard about)
- (30) *They said they heard about a Balkan language, but I don't know which Balkan language they did

Similarly for extraction out of an object NP:

- (31) They heard a lecture about a Balkan language, but I don't know which Balkan language (they heard a lecture about)

- (32) *They heard a lecture about a Balkan language, but I don't know which Balkan language they did

Even short movement of a direct object shows similar behavior:³

- (33) They studied a Balkan language but I don't know which Balkan language (they studied)

- (34) ??They studied a Balkan language but I don't know which Balkan language they did

Thus, there is indeed a difference between Sluicing and VPE, but not one that directly implicates island repair. In the next section, we will suggest an account of this difference.

2. A Possible Solution

In the previous section we saw that the contrast between VPE and Sluicing shows up whether or not the elided constituent contains an island, and therefore cannot be attributed in a direct way to a distinction in the island-repair potential of the two constructions. Furthermore, we have seen cases where both constructions allow for island repair. So, it seems reasonable to assume that all forms of deletion can repair islands.⁴

But what accounts for the fact that VPE is impossible in many environments in which Sluicing is very natural? Our answer to this question will rely on island repair but in a somewhat indirect way. We argue that in the relevant environments the parallelism conditions on deletion (Parallelism) make intermediate landing sites unavailable. Avoiding the intermediate sites (one fell swoop movement) brings about many island violations and is therefore also not a viable option, unless the islands are repaired by deletion. Such repair is possible in Sluicing since every intermediate projection is deleted. In VPE, by contrast, a smaller constituent is deleted leaving one (or more) of the islands pronounced, and consequently unrepaired.⁵

In a run-of-the-mill Sluicing environment a trace in the elided constituent is in a parallel position to that of an indefinite in the antecedent clause:

- (35) Fred said that I talked to **a certain girl**, but I don't know which girl [~~Fred said that I talked to t~~]

The obvious question is how this difference (between a trace and an indefinite) is licensed by Parallelism. We assume, following the insight of CLM, that the indefinite must be bound by existential closure in a way that is parallel to the wh-dependency in the sluiced clause. There are various ways of instantiating this idea. For concreteness, we follow Reinhart (1997) in assuming that both the wh-phrase and the indefinite NP partake in a dependency that involves quantification over choice functions:

(36) $\exists f$ choice function [Fred said that I talked to $f(\text{girl})$], but I don't know which g choice function $\langle \text{Fred said that I talked to } g(\text{girl}) \rangle$

Parallelism is satisfied since the variables in the antecedent and the elided clause are bound from parallel positions. (See Fiengo and May (1994) and Rooth (1992) for relevant definitions of Parallelism.)

The next question is how the rules of grammar license a structure such as (39). CLM claim that Sluicing is a post-syntactic operation, which copies the antecedent clause Fred said that I talked to $f(\text{girl})$ into an empty position following the wh-phrase. Their motivation for the copying operation is twofold: (a) it yields an indefinite in the sluiced clause where we would otherwise expect a trace, and (b) it explains the island insensitivity of Sluicing. We suggest that a special copying operation for Sluicing can be dispensed with. The fact that we find something similar to an indefinite in the position of the trace can be viewed as a natural consequence of the copy theory of movement (as we illustrate below). The island insensitivity, on the other hand, does not motivate a Sluicing specific explanation. Rather, it falls under a fairly broad generalization about deletion, which we tried to characterize in the previous section (island repair).

More specifically, we suggest that the word which is interpreted as an existential quantifier over choice functions (type $\langle \langle \text{cf}, t \rangle t \rangle$, where cf stands for $\langle \text{et}, e \rangle$). Such an existential quantifier cannot be interpreted adjacent to the common noun girl, a position that requires a choice function. This type mismatch is resolved in the standard way, i.e., by movement of the quantifier leaving a variable ranging over the individuals that are quantified over, in our particular

case, choice functions. Furthermore, we assume that the movement involves pied-piping, which is resolved (as is standardly assumed) by reconstruction, i.e., by deleting the pied-piped material at the head of the chain and interpreting it at the tail:

(37) which $g \text{ girl } \lambda g'$ [Fred said that I talked to g' (girl)]

In the antecedent clause a parallel structure is derived by existential closure over choice functions (see Reinhart (1997) and Kratzer (1997), among others):

(38) $\exists f \lambda f'$ [Fred said that I talked to f' (girl)]

The final structure obeys Parallelism since the elided clause is identical to the antecedent clause (modulo variable names), and since the variables in the two clauses are bound from parallel positions.

Notice that wh-movement in (39) involves no intermediate landing sites. There is a reason for this. If intermediate landing sites were present, Parallelism would not be satisfied; the clause containing deletion, represented in (42), would have an intermediate trace which is absent in the antecedent clause, (41) (since no movement is involved in the derivation of the latter).

(39) which $g \text{ girl } \lambda g'$ [Fred [$g' \lambda g''$ said $g'' \lambda g'''$ that I talked to g''' (girl)]

Subsequently, the variables in the two clauses would not be bound from parallel positions and Parallelism would not be satisfied.⁶

So, Parallelism determines that wh-movement in Sluicing cannot be successive cyclic. This seems to be problematic under the assumption that successive cyclic movement is required by considerations of locality. But as discussed in the previous section, considerations of locality are nullified under deletion (island repair). We can therefore maintain the standard assumption that intermediate landing sites are escape hatches that allow wh-movement to circumvent what would otherwise be an island.⁷ Avoiding an intermediate landing site would consequently yield an island violation. However, the violation can also be circumvented if the island is deleted and this is what we propose happens in Sluicing constructions.

This proposal provides us with an explanation of the otherwise puzzling difference between VPE and Sluicing. VPE involves deletion of a smaller constituent than the clause that is elided in Sluicing. For the sake of concreteness, let's assume that VPE deletes VP, and leaves Tense and Aspect pronounced. If a representation approximately as in (43) were to be derived with VPE instead of Sluicing, there would be two maximal projections that are not deleted and yet do not host an intermediate landing site:

(40) which g \bar{g} $\lambda g'$ [_{TP} Fred T [_{AspP} did <_{VP} say that I talked to g'(girl)>]]

The unacceptability of VPE follows if we assume that one of the two maximal projections is an island that must be circumvented by an escape hatch or by deletion.⁸ Since the islands are not deleted, the escape hatch is required, and a violation of Parallelism is unavoidable.⁹

Notice that this account of the contrast between VPE and Sluicing relies crucially on the fact that there is movement in the elided constituent but not in the antecedent constituent. Parallelism requires the avoidance of intermediate landing sites, and IP deletion (Sluicing) is consequently necessary. An immediate prediction of the account is that if the antecedent clause would be replaced with a clause that involves movement, both VPE and Sluicing would be possible. This seems to be the case as illustrated by the fact that the contrast in (44) is largely absent in (45).¹⁰

(41)a I know that John said that Mary read a certain book, but I don't know which one.

b *I know that John said that Mary read a certain book, but I don't know which one he did.

(42)a I know which book John said that Mary read, but YOU don't know which one.

b I know which book John said that Mary read, but YOU don't know which one he did.

3. Conclusion

In this work we have argued that various contrasts between Sluicing and VPE can be made to follow from the (undeniable) fact that Sluicing targets a bigger constituent. The argument is based on various theoretical assumptions that have been made in the literature, and if successful, it provides further evidence in favor of the assumptions. Thus, we have further

evidence in favor of the idea that deletion (in all its forms) is capable of island repair, that successive cyclic movement is a consequence of considerations of locality, and that some position between VP and IP is an intermediate landing site. Furthermore, if our proposal is correct, there is no need for a taxonomy of ellipsis operations of the sort advocated in CLM, and the taxonomy of islands argued for by Merchant can be eliminated or at least substantially reduced.

Footnotes

¹ As we will see shortly, it is much easier to come up with examples of island repair that involve Sluicing than with similar examples that involve VPE. The reason for this is that in Sluicing an elided clause contains a trace, while a trace is not obligatory in the antecedent. In VPE, as we will see, a trace in the elided constituent requires a trace in the antecedent. Examples of island repair with VPE are therefore bound to be very limited. (10) and (11) are ACD examples in which the antecedent VP contains a trace of QR (QR of a DP in (11) and of a degree quantifier in (10)). A test for island repair is available in these cases only because the conditions on QR are more liberal than the conditions on overt movement (see Fox (2000b), Fox (In preparation)).

² Kennedy (1997) shows that a resumptive analysis is well motivated in certain "nonparasitic gap" constructions, which parallel classic parasitic gap constructions in certain respects, but which he argues, based on proposals of Fiengo and May (1994), have a resumptive pronoun in place of a variable. One of his examples is shown in (i), which he analyzes as involving ellipsis of a VP containing a pronoun:

(i) Which article_i did you read t_j after Jim asked [who would be willing to ___]

As Kennedy notes, the analysis is very plausible in cases such as this, since there is a well formed counterpart with a pronoun and no ellipsis:

(ii) Which article_i did you read t_j after Jim asked [who would be willing to read it_i]

Note that this alternation is not possible in the central examples discussed here. (iii), based on (1)a, is quite representative.

(iii) *I believe the claim that he bit someone, but they don't know who_i I believe the claim that he bit him_i

³ See footnote 5 on the slightly improved status of (37).

⁴ One potential exception is Merchant's observation that the ban on P-stranding (attested in many languages) is not circumvented by Sluicing. We have nothing interesting to say, though we should mention that Merchant notes some exceptions; there are cases in which Sluicing does appear to repair a violation that would otherwise result from P-stranding, as in the following Hebrew

example:

- (i) Yosi diber al sefer mesuyam. Aval ani lo zoxer eize sefer (*yosi diber al t)
Yosi talked on book specific. But I not remember which book (*yosi talked on t)
'Yosi talked about a certain book. But I don't remember which book'

⁵ The slightly improved status of (37) might follow from an alternative analysis available (only) in this case, in terms of Pseudogapping. Under the account of Pseudogapping of Lasnik (1995) or Lasnik (1999), for example, all that has been elided is the lower VP of a "split-VP" structure in the sense of Koizumi (1993). And all this lower VP contains is the V and the position from which the object A-moved to [Spec, Agr_O].

⁶ We assume (contra Lasnik and Saito (1984)) that intermediate landing sites are always present in the final representation. For arguments in favor of this assumption see Fox (2000b) and Nissenbaum (2000).

⁷ Roughly following Chomsky (1986), we take all maximal projections to be potential barriers.

⁸ Evidence for landing sites between the subject and the VP can be found in Fox (2000b) and Nissenbaum (2000).

⁹ Notice that Parallelism (via the requirement of identical dependencies) has consequences for the structure of material that is outside the elided constituent. (If we eliminate the [spec, CP] trace in (42) and elide the VP as in (i), the structure would still not be parallel to (41).

- (i) which g ~~girl~~ λg' [Fred [g' λg" did <say that I talked to g"(girl)>]]

This follows from Fiengo and May's definition of Parallelism (among others) and is probably needed in order to account for Scope Parallelism.)

It is also worth noting that a structure such as (i) involves one fell swoop movement followed by successive cyclic movement and as such might violate a possible generalization of the ban on improper movement. Metaphorically, once you get on the express train, you can't subsequently switch to the local short of the destination.

¹⁰ Some speakers find (45) marginal, but we haven't found anyone who finds it as bad as (44).

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