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Sluicing and Left-branch Extraction out of Islands

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1. Introduction

It has been observed by Ross (1969), Lasnik (1999, 2000) and Merchant (2001) that Sluicing, an instance of ellipsis, has an ability to ameliorate certain grammatical violations, such as extraction out of an island. It has also been argued by Merchant (2001) that Sluicing can repair Left-branch Extraction (LBE) violations. However, as Merchant (2001) observes, if a left-branch is extracted out of an island, Sluicing fails to repair the derivation. In section 2, I will demonstrate these puzzling facts and extend the initial observation to other contexts, combining several locality violations under Sluicing. In section 3, I examine what prevents LBE in certain languages, considering a phase-based account and a structural account of Bošković (2005). In section 4, I will argue that the structural account is superior to the phase-based account in that it draws a distinction between LBE violations and standard island violations. I propose that this distinction is crucial in our understanding of why LBE out of islands cannot be remedied by Sluicing. I will make proposals about how locality violations are encoded in the derivation. This will explain why certain violations disappear under Sluicing and others do not.

2. The puzzle

2.1. The Core Phenomena

Sluicing is a term introduced by Ross (1969) to describe a phenomenon where only a wh-element is pronounced in an interrogative clause. Sluicing can be found in embedded clauses, as in (1a), as well as in main clauses, as in (1b).

(1) a. John loves somebody. I wonder $[_{CP}$ who $[_{IP}$ John loves t]

b. A: John loves somebody.B: Who?

I will adopt the basic analysis of Sluicing of Ross (1969), Lasnik (1999, 2000) and Merchant (2001) as an instance of wh-movement followed by the IP deletion at PF (under a certain requirement of identity of the elided IP with the IP in the antecedent clause).

Ross (1969) was the first to point out that island violations are improved under Sluicing. (2a) is Ross's example of extraction out of a sentential subject island and (2b) shows the improvement when such extraction is followed by Sluicing.¹

^{*} I am grateful to Howard Lasnik for many helpful discussions of this work. I also thank Ivano Caponigro, Tomo Fujii, Norbert Hornstein, Jairo Nunes and the audience of WCCFL XXIV for their insightful comments. For native-speaker judgments, many thanks go to Nina Kazanina, Tatiana Grebenyova and Irina Belokonova (Russian); Scott Fults, Lance Nathan and my undergraduate students (English).

¹ For Ross (1969), (2b) actually has a status of (??), still showing improvement as compared to (2a), but not a complete amelioration. However, it has been established since then that for most English speakers, (2b) is fully acceptable (cf. Lasnik (2000)).

- (2) a. *That he'll hire someone is possible, but I won't divulge who that he'll hire is possible
 - b. That he'll hire someone is possible but I won't divulge who [IP [that he'll hire t] is possible]

This suggests that locality violations created by extraction out of an island can be cancelled by further deletion of the structure containing the island. Merchant (2001) argues that only some island violations are actually repaired by Sluicing, with other cases involving a syntactically different sluice that does not contain an island in the first place. Consider (3) as an alternative to (2b). There is no island violation here and therefore there is no island-repair.

(3) That he'll hire someone is possible but I won't divulge who [it is]

However, Lasnik (2000) argues convincingly that extraction out of all types of islands can be repaired by Sluicing. He provides a number of examples like the ones in (4) where a version of the sluice without an island is impossible to construct. I will therefore adopt the view that all types of island violations can be repaired by Sluicing.

- (4) a. *No one has a student who owns a certain car but I can't remember what car [no one has student who owns *t*].
 - b. No one has a student who owns a certain car but I can't remember what car [no one knows a man who owns *t*].

LBE, which is unacceptable in English, is another type of violation that Sluicing is able to repair, as argued extensively by Merchant (2001). This can be seen from the contrast between (5a), involving LBE of *how expensive*, and (5b), where the same extraction is followed by Sluicing.

- (5) a. *She bought a rather expensive car but I can't remember how expensive [she bought [a t car]].
 - b. She bought a rather expensive car but I can't remember how expensive [she bought [a t car]].

It is important to determine whether we are actually dealing with LBE in this case and not an extraction of a full DP followed by an independent instance of NP-ellipsis. The unacceptability of (6) demonstrates that NP-ellipsis is unavailable in this case. Hence, the sentence in (5b) is, in fact, a case of LBE repair by Sluicing.²

(6) *She bought an expensive car but I want a cheap [car].

2.2. Left-branch extraction out of islands

Now, that we established that both island violations and LBE violations are subject to repair by the deletion of the extraction site, one might expect that, if LBE itself takes place out of an island followed by Sluicing eliminating the IP containing the island and the LBE extraction site, the result should be an acceptable sentence. However, the paradigm in (7) from Merchant (2001) demonstrates the contrary. Even though long-distance LBE is still repaired by Sluicing, as in (7a), LBE out of an adjunct island, followed by Sluicing, produces unacceptability, as in (7b).

(7) a. He said he needed a detailed report, but wait till you hear how detailed [he said he needed a *t* report]!

 $^{^{2}}$ With other types of LBE (e.g., possessor or determiner extraction), NP-ellipsis is possible, introducing an interfering factor (cf. Merchant (2001)). Therefore, in the rest of the paper, I will restrict the discussion to the adjectival LBE.

- b. *She'll be angry if he buys an expensive car, but I don't know how expensive [she'll be angry if he buys a *t* car].
- c. *He got stressed because his boss wants a detailed report, but I don't know how detailed [he got stressed because his boss wants a *t* report].
- d. *They want to hire someone who writes thorough reports, and wait till you see how thorough [they want to hire someone who writes *t* reports]!

Like Merchant's informants, my informants accepted (7a) and rejected (7b). However, the examples (7c) and (7d) were judged by some of my informants as acceptable. This could be due to the availability of a derivation not containing an island in these cases, similar to the one in (3). Lasnik (2000) points out the fact that the *if*-clause, on the other hand, makes it hard to come up with that kind of a pseudo-sluice due to its semantics. Thus, since the short reading is unavailable in (7b), the only derivation available to the speakers in this case is the one involving LBE out of an island. The badness of (7b) can then be seen as evidence of Sluicing failing to repair the LBE and island violations when those are combined in a single sluice.

Variable binding can also be used to strengthen the effect discussed above and to ensure that the sluice actually involves the extraction out of an island. As is well known, a wh-question with a universal quantifier in a subject position is ambiguous. The question in (8) can have the readings with the felicitous answers of the kind given in (9a), known as the individual reading, (9b), the functional reading, and (9c), the pair-list reading. The pair-list reading is sometimes analyzed as an instance of a functional reading, as in Chierchia (1992), but that is not relevant for our purposes. It suffices that there is a functional reading under a universal quantifier, which involves a variable bound by the universal quantifier.

(8) Who does every boy admire *t*?

(9)	a. Spiderman	Individual
	b. His father	Functional
	c. John admires Robin Hood, Max admires Spiderman	Pair-list

Functional and pair-list readings are also available in the contexts involving LBE. Obviously, we have to test this interpretive property in a language allowing LBE. Russian is such a language and Russian (10a) has the functional and the pair-list readings, with felicitous answers as in (10b) and (10c).

(10) a. Na skoljko doroguju každyj student kupil t mašinu?	Russian
how-much expensive every student bought car	
'How expensive a car did every student buy?	

Functional

- b. Tu, kotoraja jemy po-karmanu that which to-him affordable 'One car he can afford'
- c. Ivan kupil mašinu za \$6000, Vladimir kupil mašinu za \$9000 ... *Pair-list* Ivan bought car for \$6000, Vladimir bought car for \$9000 ...

Let us now combine these interpretive properties with LBE taking place out of an island and place a bound variable inside an island, to ensure the binding into an island. Consider the paradigm in (11) - (12).³ Speaker B's utterance in (11b), containing a full DP extraction out of an island, is fine as a

³ I am breaking the antecedent clause and the sluice into two separate utterances, to ease the processing of these rather complex structures.

response to speaker A's utterance in (11a) on both the functional and pair-list readings indicated in (11i) and (11ii). However, the corresponding sentence in (12b), involving LBE out of an island, is degraded.

(11) a. A: Every father will be upset if his daughter damages a rather expensive car.

b. B: Do you know how expensive a car [every father will be upset if his daughter damages t]?

- i. The one he couldn't afford to replace
- ii. John will be upset if his daughter damages a car that costs \$10000, Max will be upset if his daughter damages a car that costs \$15000 ...

(12) a. A: Every father will be upset if his daughter damages a rather expensive car.

b. B: ??Do you know how expensive [every father will be upset if his daughter damages [a t ear]]?

Since variable binding is involved in the sluiced material, (12b) must in fact involve LBE out of an island. It is important to control for the possibility of an e-type pronoun in this case. The badness of (13) suggests that we are dealing with a true bound variable.

(13) a. A: Every father will be upset if his daughter damages a rather expensive car.

b. B: *How expensive a car would his daughter have to damage?

Thus, the badness of (12b) under Sluicing is in need of explanation. Given that Sluicing can repair island violations and left-branch violations when those are independent of each other, as discussed in section 2.1, the question becomes why the same repair is not possible when the two violations are combined.

2.3. Island + Island

From what we have established so far, it could very well be the case that the phenomenon we are exploring is about stacking of any types of locality violations under Sluicing. Let us consider extraction out of two islands followed by Sluicing. It turns out that the extraction out of multiple islands does not exhibit the same behavior. (14a) demonstrates the unacceptable extraction out of a relative clause placed within a subject-island. However, when followed by Sluicing, as in (14b), the unacceptability goes away.

- (14) a. *That they'll hire a linguist who works on a certain language is impossible but I can't tell you which language that they'll hire a linguist who works on *t* is impossible.
 - b. That they'll hire a linguist who works on a certain language is impossible but I can't tell you which language.

Thus the phenomenon seems to be restricted to LBE interacting with other islands under Sluicing. Hence, the correct analysis will have to distinguish the nature of the LBE from the nature of island violations.

3. The nature of left-branch extraction

In this section, I will examine the principles which govern the availability of LBE across languages. Different types of LBE (e.g., possessor, determiner and adjectival LBE) are sometimes analyzed as having different grammatical sources and the factors that make these processes

unavailable in certain languages can be of different nature, depending on the type of LBE and a particular language in question. In addition, it is important that we focus on adjectival LBE, for the reasons stated in Footnote 2, It has been observed that adjectival LBE is permitted in languages lacking overt determiners (cf. Uriagereka (1988), Corver (1992), Bošković (2005) among others). Thus, Serbo-Croatian, Polish, Russian, Czech and Latin are languages allowing adjectival LBE and lacking overt determiners. On the other hand, Bulgarian, English, as well as modern Romance languages, all have overt determiners and disallow adjectival LBE. (15) demonstrates unacceptable instances of LBE from Bulgarian and English, while (16) exhibits some good LBE examples from Russian.⁴

(15) a. *Novata₁ prodade Petko [t_1 kola]. new-the sold Petko car 'The new car, Petko sold'

(from Bošković (2001))

Russian

Bulgarian

- b. *The new, John sold $[t_l \text{ car}]$.
- (16) a. Novuju₁ Ivan kupil [t₁ mašinu] new Ivan bought car
 'The new car, Ivan bought.'
 - b. [Na skol'ko krasivuju]₁ Ivan kupil [t₁ mašinu]? how-much beautiful Ivan bought car 'How beautiful a car did Ivan buy?'

3.1. The phase-based $account^{5}$

Bošković (2005) presents a phase-based account of why certain languages prohibit LBE. According to this account, D^0 constitutes the head of a phase, assuming the notion of a phase and Phase-Impenetrability Condition (PIC) of Chomsky (1999).⁶ As far as the structure is concerned, AP is assumed to be adjoined to NP, which is the complement of D^0 , as in (17).

(17) $[_{DP} D [_{NP} AP [_{NP} N ...]$

Bošković (2005) also assumes anti-locality, as in Bošković (1994, 1997), Abels (2003) and Grohmann (2000, 2003), which disallows movements steps that are too short and requires that movement crosses at least one maximal projection.

Consider what happens if AP is extracted in a language like English, which has D^0 , illustrated in (18a). The movement violates PIC, since DP is a phase. There is, however, a way to escape a PIC violation, namely, by moving through the specifier of a phase. Hence, if AP were to move through SpecDP as in (18), it would not violate any phase-based locality restrictions. However, such movement violates anti-locality. That is, the movement from a position adjoined to the complement of a head to the Specifier of the same head does not cross any XP boundary on its way and therefore is too short (i.e. anti-local).

⁴ The generalization is sometimes presented in terms of weak vs. strong determiners instead of absence vs. presence of determiners. It is not crucial for the purposes of this paper.

⁵ There are other analyses of LBE, such as ECP analyses of Corver (1992) and Uriagereka (1988), remnant AP movement analysis of Franks and Progovac (1994), and scattered deletion analysis of Ćavar and Fanselow (2000). For detailed discussion of those analyses and empirical and conceptual problems they face, see *Bošković (2005)*.

⁶ The basic idea of PIC is that the complement of the head of a phase (in our case, the complement of D^0) is inaccessible to further computation once a given phase is complete.

(18) a. *AP [$_{DP}$ D [$_{NP}$ t_{1} [$_{NP}$...

b. $*[_{DP} AP_1 D [_{NP} t_1 [_{NP} ...]$

Languages without determiners would then allow LBE by virtue of not having a phase created by D^0 and hence allowing the extraction.

3.2. The structural account

Bošković (2005) also presents an alternative account to that of a phase-based account. The main proposal here is that the structural position of AP with respect to NP varies crosslinguistically. English, Bulgarian and other languages with determiners are proposed to have the AP-over-NP structure, as in (19a), where AP is the complement of DP and NP is the complement of AP. On the other hand, languages without determiners, like Russian and Serbo-Croatian, are suggested to have the NP-over-AP structure, as in (19b), where AP is in the specifier position of NP.

(19) a. [_{DP} D [_{AP} Adj [_{NP} N]]]

b. [_{NP} AP N]

The idea is that the AP-over-NP structure is provided by the Universal Grammar. The lack of D^0 in a language, however, triggers the NP-over-AP structure due to the fact that AP cannot serve as an argument. On this account, LBE is impossible in languages with the structure as in (19a) because in this case a non-constituent would be extracted, as apposed to the languages with the structure as in (19b) where the extraction of AP is a regular extraction of a specifier.

3.3. Some empirical evidence for the AP/NP account:

Even though Bošković (2005) does not conclude that one of these two approaches is superior to the other, he presents a few arguments in favor of the structural account. One argument concerns the example in (20), where the adjective *big* seems to be assigning Case to its complement, as the *of*-insertion suggests. It follows if we assume that English has the AP-over-NP structure.

(20) too big of a house

On the other hand, languages without determiners and allowing LBE exhibit concord agreement between AP and the noun, as demonstrated in a paradigm from Russian in (21a)-(21c). This could be viewed as indicative of the Spec-Head configuration, where AP is in Spec,NP.

(21) a. boljšoj dom big.nom house.nom

> b. boljšogo doma big.acc house.acc

c. *boljšoj doma big.nom house.acc

Another argument for the AP-over-NP structure in English concerns the impossibility of structural (Nominative) Case in English (22a) and the obligatoriness of the Nominative Case in the parallel Serbo-Croatian example in (22b) and the obligatorness of the Accusative Case in (22c). The AP layer in English prevents the Case assignment to the NP.

Russian

(22) a. The real him/*he will never surface.

Serbo-Croatian

- b. Pravi on/*njega se nikad neće pojaviti real he.nom./him.acc refl never neg+will show-up 'The real him will never show up.'
- c. Vidjeli smo pravog njega/*on seen are real him.acc/he.nom
 'We saw the real him.'

Recall that in Section 2, we established that LBE violations behave differently under Sluicing when combined with an island violation than mere multiple island violations. Now, out of the two analyses we have considered here, it is the structural analysis that captures the asymmetry between LBE and extractions out of an island. The phase-based account simply extends the analysis of the island effects to LBE, viewing those as instances of the same phenomenon. This presents a new argument in support of the structural analysis of adjectival LBE and brings us closer to the understanding of the interaction of Sluicing and LBE out of an island.

4. Sluicing and the nature of violation marking

What does it mean for a given grammatical constraint to be violated? Some constraints are viewed as part of a definition of syntactic operations and are therefore inviolable (e.g., Minimality, as part of the definition of Attract, Chomsky (1995)). Violations of these constraints cannot take place in the first place and therefore cannot be repaired by Sluicing. There are, however, other constraints that are autonomous of the definitions syntactic operations. There have been several proposals concerning what happens when such constraints are violated. For example, Chomsky (1991) and Chomsky and Lasnik (1993) argue that ECP violations are marked on the trace of the illegitimately moved category. In other words, it is the trace that bears the inadequacy created by the locality violation. Subjacency violations have been argued to be encoded not on the trace, but rather on the structure constituting an island (Chomsky, 1972). The nature of the violation marker is irrelevant, but let us assume, following Chomsky (1972) that it is (*). If Sluicing then deletes part of the structure along with a violation marker, the effect of a violation is eliminated.

Lasnik (1995) also suggests that, if some strong features are unchecked by PF (i.e. a feature strength violation), the violation is remedied by deletion of the structure along with the unchecked strong features. Lasnik argues that that is exactly what happens in pseudogapping. In Lasnik (1999), he views this repair not as the deletion of an unchecked feature, but rather as the deletion of a lower copy of a DP that failed to pied-pipe after its formal features have undergone movement.

I would like to develop this line of reasoning and propose a unifying account of violation encoding. Let us explore the possibility that any violation is encoded on a lower copy by default, including Subjacency violations. This could be rationalized through the chain checking approach to feature checking. That is, if locality is violated, the lower copy cannot get the required information from the higher copy in order to get rid of an uninterpretable feature which was checked (i.e., eliminated) on a higher copy. The uninterpretable feature on the lower copy cannot remain undeleted, since it cannot be interpreted by the interfaces. If this feature is, however, deleted as a result of Sluicing, the problem is resolved.⁷ Conceptually, it seems to be on the right track to associate the inadequacy with the lower copy (even in Subjacency violations), since there is no obvious reason for a particular node to be sensitive to whether a moving category crosses it or not.

Now, let us extend this to LBE violations. As I have argued in the end of section 3, the phase account of LBE treats LBE violations as an instance of any other island violation, so it is not useful in distinguishing LBE from other types of violations. The structural account seems more appropriate but

⁷ Note that I do not propose any independent operation of violation marking but rather explore direct consequences of the Copy Theory of movement and feature checking.

the question is how the extraction of a non-constituent can be encoded for later repair. Such violation cannot occur in the first place, under the assumption that movement, by definition, targets only constituents.

To solve the problem, I would like to suggest a slight modification of the structural account. Instead of viewing LBE as an instance of the extraction of a non-constituent, it can be viewed as an instance of illegitimate head-movement, where a head is moved to the specifier position instead of being adjoined to a head (analogous to the analysis of a determiner extraction in **Those*₁ *I like* t_1 *flowers*). Now the violation can be marked on the lower copy, created by the head-movement and then it can be deleted along with IP under Sluicing. This is what happens in a regular LBE violation below.

(23) a. *She bought a rather expensive car but I don't remember how expensive [she bought [a t^* car]].

b. She bought a rather expensive car but I don't know how expensive [she bought [a t* car]].

The question arises how many violations can be marked on a single copy. The Sluicing repair of multiple island violations, repeated from Section 2 in (24), indicates that the number of violations does not affect the possibility of the repair by Sluicing.

(24) That they'll hire a linguist who works on a certain language is possible but I don't know which language.

What matters is whether the violations involved are of different kinds (e.g., LBE followed by an island violation vs. an island violation followed by another island violation).

- (25) a. *She'll be angry if he buys an expensive car, but I don't know how expensive [she'll be angry if he buys a *t* car].
 - b. A: Every father will be upset if his daughter damages a rather expensive car.
 - c. B: ??Do you know how expensive [every father will be upset if his daughter damages [a t car]]?

I propose that some sort of 'violation uniformity' is in effect here: when two violations are of different kinds, the first one is marked on the lower copy, just as discussed above. The second violation, however, cannot be marked on the same element, due to its different nature. Therefore, it is marked on the moving category (the higher copy). Notice that the higher copy inevitably survives Sluicing. Hence, the encoded violation also survives Sluicing, producing unacceptability of the relevant examples.

The prediction for languages allowing LBE is that sluicing should repair LBE out of an island in such languages. The prediction is borne out for Russian, as demonstrated in the paradigm in (26).

Russian

- (26) a. ??Čto Ivan skazal čto Maša kupila? what Ivan said that Maša bought 'What did Ivan say that Maša bought?'
 - b. *Na skoljko doroguju Ivan skazal čto Maša kupila [t mašinu]? how-much expensive Ivan said that Maša bought car
 'How expensive did Ivan say that Maša bought a car?'
 - c. *Ivan skazal čto Maša kupila dostatočno doroguju mašinu no ja ne pomnju* Ivan said that Maša bought rather expensive car but I not remember

na skoljko doroguju how-much expensive

5. Concluding remarks

In this paper, I have explored the interaction of island violation and LBE violations under Sluicing. The main observation is that LBE out of an island cannot be repaired by Sluicing, unlike extraction out of multiple islands. This asymmetry indicates that the processes underlying these phenomena are quite different. I proposed an account based on examining the properties of encoding grammatical violations. I suggested that the lower copy of the moved category is the default element for violation encoding and that the encoding seems sensitive to 'violation uniformity' (i.e. violations of different kinds cannot be marked on the same element.) The present analysis can be viewed as an argument for the structural account of LBE of Bošković (2005).

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