A *WH*-IN-SITU STRATEGY FOR SLUICING

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This paper investigates the sluicing construction in English. It has been assumed by Merchant (2008) among others that remnant *wh*-phrases in sluicing undergo *wh*-movement, just as in non-elided cases. By demonstrating that remnant *wh*-phrases in sluicing show the same behaviors as *wh*-phrases in situ, on the other hand, I argue that remnant *wh*-phrases can be in situ at least in certain cases, introducing the movement theory by Agbayani (2000, 2006) and Agbayani and Ochi (2006), which is consistent with the *wh*-in-situ analysis of sluicing. The *wh*-in-situ analysis proposed in this paper gives a new perspective to the language parameter regarding *wh*-movement in that *wh*-in-situ strategy can operate in English single *wh*-questions.*

Keywords: *sluicing, wh-phrases in situ, PF adjacency, island repair, feature movement*

1. Introduction

It has been well known that languages vary in whether they force *wh*-phrases to undergo overt movement to clause-peripheral positions or not (see Huang (1982) and Lasnik and Saito (1984, 1992) for more detailed discussions of this issue). For example, Chinese, a *wh*-in-situ language, allows a *wh*-phrase to be in situ; English requires a *wh*-phrase to move to a clause initial position. As for sluicing, Merchant (2001, 2008) among

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others claims that the sluicing construction in English is derived from its non-elided counterpart by deletion. This means that remnant *wh*-phrases in English sluicing undergo *wh*-movement to a left edge of clauses. On the other hand, I will argue in this paper that remnant *wh*-phrases in sluicing do not undergo *wh*-movement but may stay in situ at least in certain cases by demonstrating that remnant *wh*-phrases exhibit several properties of *wh*-phrases in situ.

This paper is organized as follows. Section 2 briefly reviews Merchant's (2008) deletion analysis as a representative of the movement analysis of sluicing, setting the stage for the main discussion in the sections thereafter. I will then show that the movement analysis cannot account for an argument-adjunct asymmetry with respect to island effects. In Section 3, I will present an alternative analysis, in which remnant *wh*-phrases do not appear overtly in Spec-CP but rather stay inside TP, introducing a movement theory consistent with the *wh*-in-situ analysis of sluicing. Section 4 shows that the proposed analysis of sluicing can account for a puzzling distribution of *the hell*. Section 5 summarizes the whole discussion.

2. A Movement Analysis: Merchant (2008)

In this section, I will present a brief overview of Merchant's (2008) analysis as a representative of the movement analysis of sluicing. Under Merchant's analysis, the sluiced sentence in (1) is basically analyzed as follows:

- (1) John bought something, but I don't know what.

(Merchant (2001))

- (2) John bought something, but I don't know [_{CP} what_i [_{C'} C [_{TP} ~~John~~ bought t_i]]]

The *wh*-phrase in (2) undergoes movement from its underlying position to Spec-CP in the same way as in regular *wh*-questions. In the PF component, all the elements including the trace of the *wh*-phrase inside the TP are deleted. In Merchant's analysis, sluiced sentences have the same syntactic representation as the non-elided counterparts do. Thus, his movement analysis has advantages in accounting for the fact that sluiced sentences and regular *wh*-questions share several properties, e.g. case-matching effects (as for the detailed discussion of them, see Merchant (2001)). On the other hand, the contrast in (3) is apparently problematic to the movement analysis, since the sluiced sentence and its non-elided counterpart behave differently.

- (3) a. *They want to hire someone who speaks a Balkan language,
but I don't remember which they want to hire someone who

speaks.

- b. They want to hire someone who speaks a Balkan language, but I don't remember which.

(Merchant (2001))

The ungrammaticality of the sentence in (3a), in which the embedded clause in the second conjunct is a regular *wh*-question, is due to a violation of the Complex NP Constraint. On the other hand, its sluiced counterpart in (3b) is grammatical despite the fact that it has the same interpretation as its non-elided counterpart in (3a).¹ Merchant (2008) explains the contrast in (3) as follows. *Wh*-phrases move successive-cyclically to Spec-CP both in sluiced sentences and in regular *wh*-questions. If *wh*-phrases cross island boundaries by movement, traces created after they move out of islands are all marked with *. If offending *-marked traces of *wh*-phrases reach PF, the derivation will crash. Thus, the regular *wh*-question in (3a) is analyzed as (4).

- (4) a. ... [CP C [TP they want to hire someone who speaks which]]
 b. ... [CP which_i [C' C [TP *t''_i [TP they [VP *t'_i [VP want to hire someone who speaks t_i]]]]]]]

In (4a), the *wh*-phrase is base-generated inside the complex NP. Then, it moves successive-cyclically out of the complex NP to Spec-CP. After the *wh*-phrase moves out of the complex NP, the traces of the *wh*-phrase are assigned a *-mark, as shown in (4b). These offending *-marked traces reach PF and the derivation crashes. Let us turn to the sluiced sentence in (3b), which has the following derivation under Merchant's analysis:

- (5) a. ... [CP C [TP they want to hire someone who speaks which]]
 b. ... [CP which_i [C' C [TP *t''_i [TP they [VP *t'_i [VP want to hire someone who speaks t_i]]]]]]]
 c. ... [CP which_i [C' C [TP ~~*t''_i~~ [TP ~~they~~ [VP ~~*t'_i~~ [VP ~~want to hire someone who speaks t_i~~]]]]]]]

Again, the representation resulting from *wh*-movement contains two *-marked traces, as shown in (5b). However, these *-marked traces are eliminated with the other elements inside the TP by deletion, as shown in (5c). This deletion of the offending traces nullifies the violation of the

¹ As Chung, Ladusaw and McCloskey (1995) point out, some sluiced sentences seem to have no "correlates" which antecede remnant *wh*-phrases. However, the discussion in this paper with respect to island effects concentrates on the sluicing cases with overt correlates.

Complex NP Constraint.²

Furthermore, Merchant's (2008) analysis described above has an advantage in accounting for the island sensitivity of VP-elided sentences:

- (6) *They want to hire someone who speaks a Balkan language, but I don't remember which they do. (Merchant (2001))

The ungrammaticality of the VP-elided sentence in (6) indicates that VP-ellipsis does not repair island violations, unlike sluicing. Under Merchant's (2008) analysis, this VP-elided sentence is analyzed as follow:

- (7) a. ... [_{CP} C [_{TP} they do want to hire someone who speaks which]]
 b. ... [_{CP} which_i [_{C'} C [_{TP} *t''_i [_{TP} they do [_{VP} *t'_i [_{VP} want to hire someone who speaks t_i]]]]]]]
 c. ... [_{CP} which_i [_{C'} C [_{TP} *t''_i [_{TP} they do [_{VP} ~~*t'_i~~ [_{VP} ~~want to hire someone who speaks t_i~~]]]]]]]

Again, the representation resulting from *wh*-movement contains two *-marked traces. In this VP-ellipsis case, one of the *-marked traces, *t'_i, is eliminated as a part of the elided VP. However, the other *-marked trace, *t''_i, survives even after the deletion takes place, as shown in (7c). This surviving trace causes a Complex NP Constraint effect.

Merchant's (2008) analysis can explain the complicated contrasts with respect to island effects. However, even Merchant's analysis cannot account for the following contrast:

- (8) a. John wants to hire someone who fixes cars with something, but I don't know what.
 b. *John wants to hire someone who fixes cars for a certain reason, but I don't know (exactly) why.

² One of the anonymous reviewers of *EL* points out an alternative derivation to (5). In this alternative derivation given in (ib), the underlying structure of the sluiced sentence does not contain an island.

- (i) a. They want to hire someone who speaks a Balkan language.
 b. Which [is it]?

Since there is no extraction out of an island, the lack of an island effect in (ib) is naturally predicted. However, Lasnik (2008) gives the following example, which indicates that the underlying structure of at least some cases of sluicing must include an island.

- (ii) Every linguist_i met a philosopher who criticized some of his_i work, but I'm not sure how much of his_i work.

In (ii), the structure must include the island in order to license the pronominal *his*. Thus, as for at least the sluiced sentence in (ii), we cannot assume that its underlying structure is a short source like (ib).

- c. *John wants to hire someone who fixes cars in a certain way, but I don't know (exactly) how.³

(Nakao (2007))

All the sentences in (8) involve sluicing but their remnant *wh*-phrases vary. The sluiced sentence with the argument *wh*-phrase *what* in (8a) exhibits an island repair effect under sluicing. On the other hand, the sluiced sentences with the adjunct *wh*-phrases *why* and *how* in (8b) and (8c), respectively, remain degraded even though they involve sluicing (see for a further discussion, Lasnik (2008) and Nakao (2007)).

Merchant (2001) himself presents similar examples:

- (9) a. *He wants to interview someone who works at the soup kitchen for a certain reason, but he won't reveal yet why.
b. *He wants to interview someone who works at the soup kitchen for a certain reason, but he won't reveal yet why he wants to interview someone who works at the soup kitchen.

(Merchant (2001: 129, fn. 11))

In (9a), the sluiced sentence with *why* as the remnant *wh*-phrase does exhibit a Complex NP Constraint effect just as its non-elided counterpart in (9b) does. The contrast between (3b) and (8a) on the one hand, and (8b–c) and (9a) on the other hand indicates that in sluicing, argument *wh*-phrases do not exhibit island effects while adverbial adjunct *wh*-phrases do. This contrast casts doubt upon Merchant's analysis. Under his analysis, all *-marked offending traces of *wh*-phrases in sluiced sentences are elided whether remnant *wh*-phrases are arguments or adjuncts. Thus, his analysis incorrectly predicts that sluiced sentences with adjunct *wh*-phrases should not exhibit island effects, contrary to fact.

In sum, I have given a review of Merchant's (2008) movement analysis of sluicing and showed that his analysis cannot accommodate the full range of data with respect to island effects; it fails to account for the argument-adjunct asymmetry.⁴

³ Although (8c) is cited from Nakao (2007), I have slightly changed her original example. Her original example is given in (i).

(i) *John wants to hire someone who fixes cars in a certain way, but I don't (exactly) know how.

In (i), *exactly* precedes *know*. In (8c), on the other hand, it follows *know*.

⁴ Several solutions to the island repair under sluicing have been put forth by Chomsky (1972), Chung, Ladusaw and McCloskey (1995), and Fox and Lasnik (2003) among others. However, all the previous analyses have the same problem as Merchant's (2008) analysis does: they cannot account for the argument-adjunct asymmetry illustrated in (8).

3. Proposal

In this section, I will present an alternative analysis, in which remnant *wh*-phrases in sluiced sentences need not always move to Spec-CP. I will show that this alternative analysis can accommodate the full range of data regarding island effects including the argument-adjunct asymmetry.

3.1. The Two-Chain Movement Theory

Before presenting my alternative, I will explicate the movement theory which is compatible with the *wh*-in-situ analysis of sluicing. The movement theory which I will adopt is the two-chain movement theory proposed by Agbayani (2000, 2006) and Agbayani and Ochi (2006). In this theory, overt *wh*-movement consists of two sub-operations: Move-F and Pied-Pipe, given in (10).

(10) The Two-Chain Movement Theory

a. Move F

The feature F (to be checked) of category α is extracted out of α and moves to the domain of a functional head H; it enters into a checking relation with an uninterpretable feature of H.

b. Pied-Pipe

Category α is pied-piped to Spec-H.

(Agbayani (2006))

Move-F is triggered by feature checking requirements. On the other hand, Pied-Pipe is regulated by the PF adjacency condition in (11) and the definition of “adjacency” is given in (12).

(11) The PF Adjacency Condition

F and its category are interpretable at PF if they are adjacent.

(Agbayani and Ochi (2006: 23))

(12) Definition of the PF Adjacency

Two elements are adjacent if no overt (i.e. phonetically realized) element intervenes between them.

(Agbayani and Ochi (2006: 23))

The PF adjacency condition in (11) means that if some overt elements intervene between the formal feature raised by Move F and its remnant category, they cannot be interpreted at the PF interface. For PF interpretations to operate successfully, the remnant category must be moved to a position adjacent to the moved feature by Pied-Pipe.

Let us consider the sentence in (13) to understand how this two-chain

movement theory works. Under this movement theory, the sentence in (13) has the derivation in (14).

(13) What will you eat? (Agbayani (2000))

- (14) a. $[_{CP} [_{C'} C_{[Q]} [_{TP} \text{you will eat what}]]]$
 b. $[_{CP} \text{wh} [_{C'} C_{[Q]} [_{TP} \text{you will eat what}]]]$
 c. $[_{CP} \text{what}_i [_{C'} \text{wh} [_{C'} C_{[Q]} [_{TP} \text{you will eat } t_i]]]]]$

(14a) represents the stage of derivation where an uninterpretable Q feature is introduced into the derivation. This feature seeks and attracts a matching feature by Move-F. In this case, the *wh*-feature of *what* is attracted by Move-F. In the resulting representation in (14b), the relationship between the moved *wh*-feature and the remnant *wh*-phrase *what* does not satisfy the PF adjacency condition in (11), because the overt elements *you will eat* intervene between them. Therefore, if nothing happened to remedy this illegitimate relationship, this derivation would crash as a violation of the PF adjacency condition. For this PF condition to be satisfied, Pied-Pipe carries the remnant *wh*-phrase *what* to an extra Spec-CP, as illustrated in (14c). This is how *wh*-phrases move to Spec-CP in English regular *wh*-questions.

Let us turn our attention to subject questions to see an intriguing consequence of the two-chain movement theory. This movement theory assigns to the *wh*-question in (15) the derivation in (16).

(15) Who will leave? (Agbayani (2000))

- (16) a. $[_{CP} [_{C'} C_{[Q]} [_{TP} \text{who will leave}]]]$
 b. $[_{CP} \text{wh} [_{C'} C_{[Q]} [_{TP} \text{who will leave}]]]$

In the representation in (16b), which is derived from (16a) by Move-F, the PF adjacency condition is satisfied since there is no overt intervener between the moved *wh*-feature and the remnant *wh*-phrase. Agbayani and Ochi claim that when the PF condition is satisfied directly after Move-F applies, the application of Pied-Pipe should be banned by the economy condition that precludes superfluous steps. Thus, the subject *wh*-phrase stays inside the TP. In Section 3.2, I will extend this movement theory to sluicing and claim that remnant *wh*-phrases in sluicing can be in situ in the same way as subject *wh*-phrases do.

3.2. A *Wh*-In-Situ Analysis of Sluicing

I have explicated the movement theory I adopt in this paper. Now I am ready to propose my *wh*-in-situ analysis of sluicing. I claim that the sluiced sentence in (1), reproduced as (17), is best analyzed as in (18), where the derivation of the embedded interrogative clause in the second

sentence is shown.

(17) John bought something, but I don't know what.

- (18) a. ... [_{CP} C_[Q] [_{TP} John bought what]]
 b. ... [_{CP} *wh* [_{C'} C_[Q] [_{TP} John bought what]]]
 c. ... [_{CP} *wh* [_{C'} C_[Q] [_{TP} ~~John bought~~ what]]]

(18a) represents the stage of derivation where an uninterpretable Q feature is introduced into the derivation. In order to check this feature, the *wh*-feature of *what* moves to Spec-CP by Move-F. In the resulting representation (18b), the PF adjacency condition is not satisfied, since the overt elements *John bought* intervene between the moved *wh*-feature in Spec-CP and its remnant *wh*-phrase *what*. If nothing happened to remedy this relationship, this derivation would crash. In section 3.1, we have seen that one way to salvage such a derivation from a violation of the PF adjacency condition is to apply Pied-Pipe to the remnant *wh*-phrase. However, I claim that there is another way to meet the PF adjacency condition: deletion of interveners between moved features and their remnant categories. I assume that sluicing can affect non-constituents and delete all the elements inside TP except the *wh*-phrase, as shown in (18c).⁵ This deletion eliminates *John bought*, which intervene between the moved *wh*-feature and its remnant category. As a result, the PF adjacency condition is satisfied without taking recourse to Pied-Pipe. This is how remnant *wh*-phrases in sluicing can be in situ.

⁵ In this paper, I assume that sluicing can delete non-constituents. Although this assumption has been considered to be undesirable by many linguists, van Craenenbroeck and den Dikken (2006) give an independent argument that ellipsis can affect non-constituents. They examine the short answer in (ib) to the *wh*-question in (ia).

- (i) a. What didn't work?
 b. Any of the printing equipment.

(van Craenenbroeck and den Dikken (2006))

The short answer in (ib) includes a negative polarity item, *any*, which is required to be c-commanded by a negative phrase. Since there is no negative phrase, *any* is predicted to be unlicensed, contrary to fact. To resolve this problem, van Craenenbroeck and den Dikken analyze this short answer as in (ii).

- (ii) a. [_{TP} T NEG [_{VP} any of the printing equipment work]]
 b. [_{TP} T-NEG [_{VP} any of the printing equipment work]]

In (iia), the short answer has a full-fledged syntactic structure, where the negative polarity item in VP is appropriately c-commanded by the negative element. In the phonological component, deletion applies to the whole TP but actually elides all the elements except the subject, yielding the surface form, as shown in (iib).

One might object that if Pied-Pipe is a syntactic operation, then the replacement of Pied-Pipe by deletion claimed above causes a “look-ahead” problem. One possibility of evading this problem is to assume that some information about ellipsis is given in syntax. For example, the “E-feature” proposed by Merchant (2001) enables us to implement this possibility. This feature, which instructs PF not to parse its complement, is introduced in syntax. Once we assume this feature as a trigger of deletion, we can decide whether deletion takes place or not in syntax.

Now let us consider how this *wh*-in-situ analysis of sluicing can capture its properties with respect to island effects. The first relevant contrast is reproduced in (19).

- (19) a. They want to hire someone who speaks a Balkan language, but I don’t remember which.
 b. *They want to hire someone who speaks a Balkan language, but I don’t remember which they want to hire someone who speaks.
 c. *They want to hire someone who speaks a Balkan language, but I don’t remember which they do.

To recapitulate, the contrast in (19) indicates that regular *wh*-questions and their VP-elided counterparts are sensitive to island constraints while their sluiced counterparts are not.

Let us begin with the sluicing case in (19a), which has the derivation in (20) under the proposed analysis.

- (20) a. ... [CP $C_{[Q]}$ [TP they want to hire someone who speaks which]]
 b. ... [CP *wh* [C' $C_{[Q]}$ [TP they want to hire someone who speaks which]]]
 c. ... [CP *wh* [C' $C_{[Q]}$ [~~TP they want to hire someone who speaks~~ which]]]

In (20), only Move-F takes place but not Pied-Pipe, since the PF adjacency condition can be met by deleting the overt interveners between the moved *wh*-feature and its remnant phrase. For the sake of discussion, let us assume that island constraints are conditions on Pied-Pipe, but not on Move-F. Then, the island insensitivity of the sluiced sentence in (19a) can be attributed to the lack of the application of Pied-Pipe.

Let us turn to the regular *wh*-question case in (19b), which has the derivation in (21) under our analysis.

- (21) a. ... [CP $C_{[Q]}$ [TP they want to hire someone who speaks which]]

- b. ... [_{CP} *wh* [_{C'} *C*_[Q] [_{TP} they want to hire someone who speaks which]]]
- c. ... [_{CP} *which*_i [_{C'} *wh* [_{C'} *C*_[Q] [_{TP} they want to hire someone who speaks *t*_i]]]]]

In (21), since deletion does not take place, the only way for this derivation to meet the PF adjacency condition is to pied-pipe the remnant *wh*-phrase, as shown in (21c). However, this application of Pied-Pipe extracts the *wh*-phrase out of the island, resulting in a violation of the Complex NP Constraint.

Finally, let us move on to the VP-elided case in (19c), whose derivation is given in (22).

- (22) a. ... [_{CP} *C*_[Q] [_{TP} they do [_{VP} want to hire someone who speaks which]]]
- b. ... [_{CP} *wh* [_{C'} *C*_[Q] [_{TP} they do [_{VP} want to hire someone who speaks which]]]]]
- c. ... [_{CP} *wh* [_{C'} *C*_[Q] [_{TP} they do [_{VP} ~~want to hire someone who speaks~~ which]]]]]

In (22), Move-F and VP deletion apply but not Pied-Pipe. Let us assume that deletion of VP applies in a way parallel to the sluicing case. Then, deletion targets VP except the focused *wh*-phrase, as shown in (22c). However, unlike the sluicing case, this deletion does not eliminate all the interveners between the moved *wh*-feature and its remnant category, resulting in a violation of the PF adjacency condition. Thus, for the derivation of the VP-elided sentence to meet this PF condition, the *wh*-phrase must undergo Pied-Pipe, as shown in (23).

- (23) a. ... [_{CP} *C*_[Q] [_{TP} they do [_{VP} want to hire someone who speaks which]]]
- b. ... [_{CP} *wh* [_{C'} *C*_[Q] [_{TP} they do [_{VP} want to hire someone who speaks which]]]]]
- c. ... [_{CP} *which*_i [_{C'} *wh* [_{C'} *C*_[Q] [_{TP} they do [_{VP} want to hire someone who speaks *t*_i]]]]]]]
- d. ... [_{CP} *which*_i [_{C'} *wh* [_{C'} *C*_[Q] [_{TP} they do [_{VP} ~~want to hire someone who speaks~~ *t*_i]]]]]]]

In this derivation, the *wh*-phrase is pied-piped to Spec-CP prior to deletion, as shown in (23c). This application of Pied-Pipe puts the *wh*-phrase in a position adjacent to its moved *wh*-feature. As a result, the PF adjacency condition is satisfied. However, this application of Pied-Pipe extracts the *wh*-phrase out of the complex NP, resulting in a violation of the Complex NP Constraint.

Let us move on to another contrast with respect to island effects: i.e. the argument-adjunct asymmetry, which is problematic to Merchant's (2008) analysis. The relevant examples are reproduced below:

- (24) a. John wants to hire someone who fixes cars with something, but I don't know what.
 b. *John wants to hire someone who fixes cars for a certain reason, but I don't know (exactly) why.
 c. *John wants to hire someone who fixes cars in a certain way, but I don't know (exactly) how.

The contrast in (24) indicates that sluicing repairs island violations when it has an argument *wh*-phrase while it does not when it has an adverbial adjunct *wh*-phrase. From the point of view of the present discussion, what is interesting is the fact that a similar argument-adjunct asymmetry is observed in *wh*-in-situ languages. Huang (1982) and Lasnik and Saito (1992) point out that in Chinese, *wh*-questions with argument *wh*-phrases do not exhibit island effects, while those with adverbial adjunct *wh*-phrases do. Relevant examples are cited from Huang (1982).

- (25) a. Ta taolun sheme de shu zui yuoku?
 he discuss what DE book most interesting
 'Lit. Books in which he discusses what are most interesting?'
 b. *Ta weisheme xie de shu zui youqu?
 he why write DE book most interesting
 'Lit. Books that he wrote why are most interesting'

(Huang (1982))

In (25a), the *wh*-phrase in situ is *sheme* 'what' and this sentence does not show a Complex NP Constraint effect. In (25b), on the other hand, the *wh*-phrase in situ is *weisheme* 'why' and this sentence is ungrammatical. Given that the argument-adjunct asymmetry regarding island effects is a property of *wh*-phrases in situ, a similar asymmetry in sluicing is not a surprising fact under our *wh*-in-situ analysis. Though various analyses have been put forth for the argument-adjunct asymmetry, a detailed analysis of the argument-adjunct asymmetry is out of the scope of the present discussion.⁶

⁶ In this paper, I do not touch upon the issue of how the argument-adjunct asymmetry is explained in a principled way. One possible explanation is that proposed by Tsai (1994), according to which the argument-adjunct asymmetry is attributed to the possibility of unselective binding. Argument *wh*-phrases in situ can be licensed by unselective binding in their underlying positions. On the other hand, adjunct *wh*-phrases in situ do not have this option and hence must move to a left edge of clauses.

In sum, we have seen in this section that once we assume that remnant *wh*-phrases in sluicing can be in situ, the full range of data with respect to island effects can be accounted for.

4. A Further Consequence

I have shown so far that remnant *wh*-phrases in sluicing can be in situ as long as the PF adjacency condition is satisfied by deletion, and that the *wh*-in-situ analysis of sluicing has some virtues in accounting for the (dis-) appearance of island effects. In this section, I will give some consequence of the proposed analysis from the puzzling distribution of *the hell*. Under the present analysis, remnant *wh*-phrases in sluicing are in situ. Hence, we predict that remnant *wh*-phrases in sluicing should also exhibit properties of *wh*-phrases in situ other than the argument-adjunct asymmetry described above. This expectation is in fact borne out by the distribution of *the hell*, an expression which can modify *wh*-phrases, as shown in (26).

- (26) What the hell book did you read that in?

(Lasnik and Saito (1992))

Pesetsky (1987) and Lasnik and Saito (1992) observe that *the hell* cannot co-occur with *wh*-phrases in situ. Thus, we can find the following contrast:

- (27) a. Who read what?
b. *Who read what the hell?

(Lasnik and Saito (1992))

The *wh*-question in (27b) differs from that in (27a) in that the *wh*-phrase in situ is modified by *the hell*. Thus, the ungrammaticality of the sentence in (27b) should be attributed to the occurrence of *the hell*.

What is interesting here is that remnant *wh*-phrases in sluicing show a similar restriction. López (2000), Merchant (2001) and Sprouse (2006) point out that *the hell* cannot modify remnant *wh*-phrases in sluicing. Relevant examples are cited from Sprouse (2006).

- (28) a. They were arguing about something, but I don't know what.
b. *They were arguing about something, but I don't know what the hell.

(Sprouse (2006))

Under our analysis, the contrast in (28) is not surprising since the *wh*-phrases are in situ. Thus, the contrast in (28) can be explained by what-

ever is responsible for that in (27).⁷

I have shown that remnant *wh*-phrases in sluicing can be in situ and that this *wh*-in-situ analysis can capture some parallelisms between remnant *wh*-phrases in sluicing and *wh*-phrases in situ. However, an anonymous reviewer for *EL* points out that so-called swiping examples, where a sluiced *wh*-phrase is followed by a preposition, seem to be problematic to the *wh*-in-situ analysis of sluicing. The relevant example in (29b) is cited from Sprouse (2006).

- (29) a. They are arguing, but I don't know what they are arguing about.
 b. They are arguing, but I don't know what about.

(Sprouse (2006))

The *wh*-phrase in (29b) seems to undergo overt movement in the same way as in the non-elided sentence in (29a). I accommodate this case of sluicing by claiming that in swiping cases, remnant *wh*-phrases undergo Pied-Pipe, unlike in regular sluicing cases in (28a). Recall that under the proposed analysis, whether *wh*-phrases undergo Pied-Pipe or not is determined on the basis of the PF adjacency condition. If deletion cannot eliminate all the interveners between a moved *wh*-feature and its remnant phrase, it is predicted that remnant *wh*-phrases must be pied-piped even in sluicing cases. I claim that swiping is such a case. If the remnant *wh*-phrase in (29b) does not undergo Pied-Pipe, then the derivation causes a violation of the PF adjacency condition, as shown in (30).

- (30) a. [CP C_[Q] [TP they are arguing [PP about [DP what]]]]
 b. [CP *wh* [C' C_[Q] [TP they are arguing [PP about [DP what]]]]]
 c. [CP *wh* [C' C_[Q] [~~TP they are arguing~~ [PP about [DP what]]]]]

In (30a), the *wh*-phrase is base-generated as the complement of the preposition *about*. Move-F strips the *wh*-feature away from the *wh*-phrase, as shown in (30b). Suppose that sluicing is a deletion operation regulated by the recoverability condition. Then, in this case, sluicing elides all the elements inside the TP except the preposition and the *wh*-phrase, since they cannot be recovered from the antecedent clause. In the resulting PF representation in (30c), the PF adjacency condition is not satisfied, since the

⁷ It is beyond our scope why *the hell* cannot co-occur with *wh*-phrases in situ. One possible way to answer this question is to assume, following Pesetsky (1987), that *wh-the hell*, being “aggressively non-D-linked,” cannot be licensed by unselective binding and must undergo movement.

overt element *about* still intervenes between the moved *wh*-feature and its remnant category *what*. Thus, in order for the PF adjacency condition to be met, the remnant *wh*-phrase must be pied-piped to a position preceding the preposition *about*. I assume that the landing site of the *wh*-phrase is Spec-PP, following the shortest movement condition, as shown in (31).

- (31) a. [_{CP} C_[Q] [_{TP} they are arguing [_{PP} about [_{DP} what]]]]
 b. [_{CP} *wh* [_{C'} C_[Q] [_{TP} they are arguing [_{PP} about [_{DP} what]]]]]
 c. [_{CP} *wh* [_{C'} C_[Q] [_{TP} they are arguing [_{PP} what_i [about [_{DP} t_i]]]]]]]
 d. [_{CP} *wh* [_{C'} C_[Q] [~~TP~~ ~~they are arguing~~ [_{PP} what_i [about [_{DP} t_i]]]]]]]

In (31), the *wh*-phrase undergoes Pied-Pipe to Spec-PP prior to deletion. As a result, the relation between the moved *wh*-feature and its remnant category *what* satisfies the PF adjacency condition. This is how remnant *wh*-phrases in swiping cases undergo Pied-Pipe to meet the PF adjacency condition.⁸

I have argued that remnant *wh*-phrases in swiping cases undergo Pied-Pipe, unlike regular sluicing cases. If this is correct, it is predicted that

⁸ In this paper, we only consider the derivation of swiping cases. However, it is known that English allows the canonical word order shown in (i) in addition to the swiping order in (29b).

- (i) They are arguing, but I don't know about what.

In (i), the remnant *wh*-phrase follows the preposition. To derive this sluiced sentence in (i), I utilize an optional feature percolation mechanism. It is sometimes assumed that feature percolation takes place optionally from a *wh*-phrase to a dominating PP to derive the alternation between pied-piping cases and p-stranding cases like (ii).

- (ii) a. I don't know with whom she was dancing.
 b. I don't know who she was dancing with.

Under the optional feature percolation mechanism, in the pied-piping case in (iia), the *wh*-feature of *whom* percolates up to the dominating PP. As a result, the whole PP is considered as a *wh*-phrase and undergoes *wh*-movement. On the other hand, in the p-stranding case in (iib), the *wh*-feature does not percolate, the *wh*-phrase itself is considered as a *wh*-phrase and moves to Spec-CP with the preposition left behind.

I extend this optional feature percolation mechanism to the non-swiping case in (i), whose derivation is given below:

- (iii) a. [_{CP} C_[Q] [_{TP} they are arguing [_{PP} about [_{DP_[wh]} what]]]]]
 b. [_{CP} C_[Q] [_{TP} they are arguing [_{PP_[wh]} about [_{DP} what]]]]]
 c. [_{CP} *wh* [_{C'} C_[Q] [_{TP} they are arguing [_{PP} about [_{DP} what]]]]]
 d. [_{CP} *wh* [_{C'} C_[Q] [~~TP~~ ~~they are arguing~~ [_{PP} about [_{DP} what]]]]]

In (iiib), the *wh*-feature of *what* percolates up to the PP. As a result, this whole PP is considered as a *wh*-phrase. Then, the *wh*-feature of the PP moves to Spec-CP by Move-F, as shown in (iiic). In the phonological component, the materials in TP except the PP are deleted based on the recoverability condition. In the resulting representation in (iiid), the PF adjacency condition is satisfied, since the moved *wh*-feature and the remnant category *about what* are adjacent. This is how the remnant *wh*-phrase in the non-swiping case in (i) is in situ, unlike that in the swiping case in (29b).

remnant *wh*-phrases in swiping cases will not exhibit any diagnostics of *wh*-phrases in situ, unlike regular sluicing cases. This prediction is borne out by the distribution of *the hell*. Merchant (2001) and Sprouse (2006) observe that remnant *wh*-phrases in swiping cases can be modified by *the hell*. The relevant example is cited from Sprouse (2006).

(32) They were arguing, but I don't know what the hell about.

(Sprouse (2006))

The grammatical swiped sentence in (32) contrasts with the regular sluicing case in (28b), both of which contain a remnant *wh*-phrase modified by *the hell*. The possibility of modification by *the hell* in (32) can be accounted for since the remnant *wh*-phrase is not in situ.

In short, I have pointed out another parallelism between remnant *wh*-phrases in sluicing and *wh*-phrases in situ; *the hell* cannot modify them. Furthermore, I have suggested that remnant *wh*-phrases in swiping do involve Pied-Pipe so that they can be modified by *the hell*.

5. Conclusion

In this paper, I have proposed a *wh*-in-situ analysis of sluicing, in which remnant *wh*-phrases need not always move overtly to Spec-CP. Once we assume that remnant *wh*-phrases in sluicing can be in situ (as long as the PF adjacency condition is satisfied), the full range of data with respect to island effects including the argument-adjunct asymmetry can be naturally captured. Furthermore, I have argued that whether remnant *wh*-phrases in sluicing move overtly or not is determined by the PF adjacency condition proposed by Agbayani (2000, 2006) and Agbayani and Ochi (2006). Thus, I have claimed that while swiping involves Pied-Pipe, regular sluicing do not. This claim is supported by the puzzling distribution of *the hell*: remnant *wh*-phrases in swiping can be modified by *the hell*, while those in regular sluicing cannot. Finally, as long as our *wh*-in-situ analysis of sluicing is on the right track, the whole discussion of this paper provides additional support for Agabayani and Ochi's movement theory.

REFERENCES

- Agbayani, Brian (2000) "*Wh*-Subjects in English and the Vacuous Movement Hypothesis," *Linguistic Inquiry* 31, 703–713.
 Agbayani, Brian (2006) "Pied-Piping, Feature Movement, and *Wh*-Subjects," *Wh*-

- Movement: Moving On*, ed. by Lisa Cheng and Norbert Corver, 71–93, MIT Press, Cambridge, MA.
- Agbayani, Brian and Ochi Masao (2006) “Move F and PF/LF Defectiveness,” *Minimalist Essays*, ed. by Cedric Boeckx, 19–34, John Benjamins, Amsterdam.
- Chomsky, Noam (1972) “Some Empirical Issues in the Theory of Transformational Grammar,” *Goals of Linguistic Theory*, ed. by Paul Stanley Peters, 63–130, Prentice-Hall, Englewood Cliffs, NJ.
- Chung, Sandra, William Ladusaw and James McCloskey (1995) “Sluicing and Logical Form,” *Natural Language Semantics* 3, 239–282.
- Craenenbroeck, Jeroen van and Dikken Marcel den (2006) “Ellipsis and EPP Repair,” *Linguistic Inquiry* 37, 653–664.
- Fox, Danny and Howard Lasnik (2003) “Successive-Cyclic Movement and Island Repair: The Difference between Sluicing and VP-Ellipsis,” *Linguistic Inquiry* 34, 143–154.
- Huang, James (1982) *Logical Relation in Chinese and the Theory of Grammar*, Doctoral dissertation, MIT. [Published by Garland, New York, 1998.]
- Lasnik, Howard (2008) “Repair by Ellipsis Revisited,” a handout from a lecture at Nanzan University.
- Lasnik, Howard and Saito Mamoru (1984) “On the Nature of Proper Government,” *Linguistic Inquiry* 15, 235–289.
- Lasnik, Howard and Saito Mamoru (1992) *Move α : Conditions on Its Application and Output*, MIT Press, Cambridge, MA.
- Luis López (2000) “Ellipsis and Discourse-Linking,” *Lingua* 110, 183–213.
- Merchant, Jason (2001) *The Syntax of Silence: Sluicing, Islands, and the Theory of Ellipsis*, Oxford University Press, Oxford.
- Merchant, Jason (2008) “Variable Island Repair under Ellipsis,” *Topics in Ellipsis*, ed. by Kyle Johnson, 132–153, Cambridge University Press, Cambridge.
- Nakao, Chizuru (2007) “Copy Free Movement, Swiping and the ECP,” ms., University of Maryland. <http://www.ling.umd.edu/~cnakao/Nakao_895.pdf>
- Pesetsky, David (1987) “*Wh*-In-Situ: Movement and Unselective Binding,” *The Representation of (In)definiteness*, ed. by Eric Reuland and Alice ter Meulen, 98–129, MIT Press, Cambridge, MA.
- Sprouse, Jon (2006) “The Accent Projection Principle: Why the Hell Not?” *University of Pennsylvania Working Papers in Linguistics* 12, 349–359.
- Tsai, Wei-Tien Dylan (1994) *On Economizing the Theory of A-bar Dependencies*, Doctoral dissertation, MIT. [Published by Garland, New York, 1999.]

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