A Feature Movement Analysis of Swiping in English[*]
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1. Introduction

The aim of this paper is to present a somewhat new analysis of what Merchant (2002) calls *swiping* (sluiced *wh*-word inversion with prepositions in Northern Germanic) in English, exemplified in (1):

(1) a.   Lois was talking, but I don't know who to.

     b.   She bought a robe, but God knows who for.

(Merchant (2002:294))

In (1), though the *wh*-element *who* is the object of the prepositions, it appears before the prepositions, not after them. This fact leads us to consider swiping as an interesting linguistic phenomenon, since it is not compatible with a general principle in English that a head must precede its complement.

The analyses of swiping can be broadly divided into two classes: the pied-piping analysis (Merchant (2002)) and the P-stranding analysis (Hasegawa (2006), and Nakao (2007)). In fact, Sugisaki (2007) argues, referring to first language acquisition data, that the P-stranding analysis is superior to the pied-piping analysis. The similarity between the two analyses is that they involve *wh*-category movement in generating a swiping sentence. However, there is another way to derive the linear order of the *wh*-elements and the prepositions in (1). More specifically, it could be achieved even if the *wh*-elements do not move overtly. In this paper, I would like to pursue the feature movement approach, adapting the machinery involved in the previous studies as useful tools for implementing my idea.

The organization of the paper is as follows. In section 2, I will present properties of swiping to be explained. In section 3, I will make a proposal of how the swiping sentence is derived, based on the mechanism proposed by Agbayani (2006). In section 4, I will show that the properties of swiping listed in section 2 follow from the proposed derivation. In section 5, I will give some pieces of evidence supporting the proposal and point out some remaining problems. In section 6, a conclusion of this paper will be presented.

2. Properties of Swiping

In this section, as a first step, I will identify four properties of swiping which

any adequate analysis of swiping must capture.

First, Merchant (2002) observes that the *wh*-elements occurring in swiping sentences are quite limited.[1] Consider the following:

(2) a. He was shouting, but it was impossible to tell who at.

  b. They were arguing; God only knows what about.

  c. He'll be at the Red Room, but I don't know when till.

  d. He sold his farm and moved away, but no-one knows where to.

  e. % He's been living in Arizona, but I don't know how long for.

  f. % She bought it all right, but don't even ask how much for.

  g. % There's a lot of cities on her list, so she'll traveling a lot, but I don't know how many to.

  h. *She bought a robe for one of her nephews, but God knows which (one) for.

  i. *He'll be at the Red Room, but I don't know what time till.

  j. *They were riding in somebody's car, but I don't know whose in.

(Merchant (2002:294-296))

Sentences (2a-d), where the *wh*-elements *who*, *what*, *when*, and *where* appear, are all acceptable. When the *wh*-elements are *how long*, *how much*, and *how many*, as in (2e-g), the acceptability varies from speaker to speaker. On the other hand, when they are *which (one)*, *what time*, and *whose*, as in (2h-j), the sentences are totally unacceptable. Merchant (2002) refers to the restriction on the *wh*-element occurring in the swiping sentence as 'the minimality condition,' as stated in (3):

(3) The minimality condition:

  Only 'minimal' *wh*-operators occur in swiping.   (Merchant (2002:297))

The 'minimal' *wh*-operators in (3) mean heads, not phrases. Given that the most natural examples of swiping in (2) include monomorphemic *wh*-elements, condition (3) can correctly account for the acceptability of the swiping sentences.[2, 3]

However, Lasnik (2007) illustrates that the condition in (3) is too strong, giving some examples in which phrasal *wh*-elements do occur, originally provided in Hartman (2007):[4]

(4) a. He fought in the civil war, but I don't know which side for.

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[1] This fact is also pointed out by Culicover (1999).

[2] Merchant (2002) adduces evidence to show that the *wh*-element occurring in the swiping sentence behaves syntactically like a head.   See Merchant (2002) for detailed discussion.

[3] Craenenbroeck (2004) suggests that the *wh*-elements *how much* and *how many* are also monomorphemic in many languages, a fact pointed out by Jason Merchant in their discussion.

[4] In the original sentence of (4b), there is an apparent typographic error.   Sentence (4b) in this paper is a collected one by the author.

     b.   It appears to have been translated, but I can't tell what language from.

<div align="right">(Lasnik (2007:3))</div>

In the sentences in (4), the *wh*-elements consist of the *wh*-words and the nouns, and therefore they are phrasal. In light of this fact, any analysis of swiping must allow not only head *wh*-elements but also phrasal ones to occur in the construction.

    Second, swiping only occurs in the environment where sluicing is involved. Observe the following sentences:

(5) a.   Peter went to the movies, but I don't know who with.

<div align="right">(Merchant (2002:289))</div>

     b.   *I don't know who to Lois was talking.

     c.   *We know when she spoke, but we don't know what about she did.

     d.   *What about she was talking was *Buddenbrooks*.

     e.   *It was Thomas Mann who about she was speaking.

     f.   *I finally met the guy who about she won't shut up.

     g.   *I always hate who with he goes out.

<div align="right">((5b-g): Merchant (2002:298))</div>

Sentence (5a), in which the TP *Peter went to the movies* is absent in the second conjunct, is completely impeccable. On the other hand, the sentences in (5b-g) are derived without any application of sluicing; (5b) is a nonelliptical question, (5c) a question with VP-deletion, (5d) a pseudocleft sentence, (5e) a cleft sentence, (5f) a relative clause, and (5g) a free relative sentence. Note that the sentences are all unacceptable. Merchant (2002) calls this restriction 'the sluicing condition,' as formulated in (6):

(6) The sluicing condition:

     Swiping only occurs in sluicing.   (Merchant (2002:298))

    Third, the prepositions selecting the *wh*-elements in swiping sentences bear stress. Observe the following:

(7) a.   Ed invited someone, but I don't know {WHO / *who}.

     b.   Ben was talking, but I don't know {to WHOM / *TO whom}.

     c.   Ben was talking, but I don't know {*WHO to / who TO}.

<div align="right">(Craenenbroeck (2004:27))</div>

In (7a), which is a normal sluicing example, the stress is placed on the *wh*-element *who*. Again, in (7b), in which the preposition is pied-piped along with the *wh*-element, the latter has stress. Interestingly, in the swiping example in (7c), the stress shifts to the preposition.

    Fourth, swiping is available only when there is no antecedent for the

preposition selecting the *wh*-element.[5]   Consider the following sentences:

(8) a.   John fixed it, but I don't remember what with.

     b.   John was talking, but I don't remember who to.

     c.   *John talked to someone, but I don't remember who to.

<div align="right">(Nakao (2007:36))</div>

In the sentences in (8a, b), there is no preposition in the antecedent clause and both of them are acceptable.   In contrast, in sentence (8c), the same preposition appears in both conjuncts and it is unacceptable.   The difference in the acceptability shows that the content of the preposition selecting the *wh*-element must be focalized.

     To sum up, in this section, I described the four properties of swiping.   In the next section, bearing them in mind, I will present a feature movement analysis of swiping.

3.   A Proposal

     As mentioned just above, in this section, I will offer the derivation of swiping. Before doing it, I will discuss one motivation for the feature movement approach to it, and outline Agbayani's (2006) proposal of *wh*-movement, on which the proposed derivation of swiping relies.

3.1.   A Motivation for the Feature Movement Approach

     Culicover (1999) makes an interesting observation that there is a close relation between the existence of a trace and the stress pattern of the sentence.   Observe the following:

(9) a.   who he gave his BOOKS to *t*

     b.   *who he gave his books TO *t*

     c.   what are you LOOKING at *t*

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[5] Some exceptions to this restriction are suggested by Rosen (1976), Craenenbroeck (2004), and Nakao (2007).   Some examples are given in (i):

(i)   a.   Howard shares the apartment with someone, but I have no idea who with.

<div align="right">(Craenenbroeck (2004:28))</div>

      b.   ?John talked t_{PP} yesterday [$_{PP}$ to someone], but I don't know who to.
        cf. *John talked [$_{PP}$ to someone] yesterday, but I don't know who to.

<div align="right">(Nakao (2007:37))</div>

Merchant (2002) and Nakao (2007) argue that these sentences can be accommodated by keeping the PPs *with someone* and *to someone* outside the antecedent for TP-deletion.   In effect, the prepositions *with* and *to* in the second conjunct have no antecedent and are focalized. Furthermore, they suggest that this is achieved by the rightward movement of the PPs.   The difference in the acceptability of the sentences in (ib) verifies their suggestion.   In this paper, however, I do not deal with these exceptions, because the main concern here is how the reversed linear order of the preposition and its object is derived.

     d.   *what are you looking AT *t*

(Culicover (1999:138))

All the sentences in (9) involve *wh*-movement. Comparing the sentences in (9a, c) on one hand with those in (9b, d) on the other hand, we can recognize that the expressions *books* and *looking* do bear stress, rather than the prepositions. Culicover argues that the stress pattern is governed by the rules as follows:[6]

(10) a.   Put the stress on a right branch.

     b.   If the right branch is null, shift to the closest head to the left.

(Culicover (1999:139))

Let us here show how the rules derive the stress pattern found in (9). First, rule (10a) puts the stress on the PPs *to/at t*. The right branch of the PPs is occupied by the trace, which is a null element, and then rule (10b) searches the closest head to the left of the prepositions, which are in the domain defined by rule (10a). Obviously, in (9a, b) and (9c, d), the elements which appear just to the left of them are *books* and *looking*, respectively. In this way, the rules can correctly yield the desired result.

In contrast to the sentences in (9a, c), in the swiping sentence, the stress is on the preposition, as already observed in (7c). Confirm again this point with the following sentences:

(11) a.   He gave his books to someone, but I forget who TO *t*. (...*WHO to)

     b.   He was looking at something, but I forget what AT *t*. (...*WHAT to)

     c.   He gave a picture of Mary to someone, but I forget who TO *t*.

(...*WHO to)

(Culicover (1999:139))

In the sentences in (11), the prepositions must have stress, rather than the *wh*-elements.[7] Given the rules in (10), if there were also a trace in each sentence, the stress would shift to the *wh*-element in the same manner as it did in the sentences in (9a, c). The stress pattern in (11), therefore, suggests that the representation of the swiping sentence includes no trace, which in turn implies that the derivation of it does not involve any *wh*-movement.

It is of particular importance to note that the pied-piping analysis and the P-stranding analysis of swiping face a fundamental contradiction to the above

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[6] The rules in (10) correspond to Neutral Accent Placement and Switch Rule formulated in Culicover and Rochement (1983), respectively. For further detail, see Culicover and Rochement (1983).

[7] Given the acceptability of sentences (7a, b), there is no rule in English that the *wh*-elements must not have stress.

implication, since both analyses derive swiping sentences via *wh*-category movement. This indicates that a novel approach to swiping must be explored.

Returning to the sentences in (11), we are able to infer a disturbing fact. Given the rules in (10), the stressed prepositions must be located in the rightmost position within the PP. This suggests that in the swiping sentence, the preposition selects no object. If this is the case, the characterization of swiping given in the introduction is no longer available, since the linear order of the *wh*-element and the preposition is truly irrelevant to the idiosyncrasy of it. However, there is a piece of evidence against it. Merchant (2002) observes that the *wh*-elements *how* and *why* do not occur in swiping sentences despite the fact that they are monomorphomic, and claims that it is because they cannot be selected by a preposition. It is perfectly evident that we encounter a paradox as to whether or not the preposition in the swiping sentence has its object. As a means to resolve it, the feature movement approach should be a viable alternative.[8]

3.2. Agbayani (2006)

Agbayani (2006) makes an interesting proposal that a *wh*-subject can be licensed by feature movement and PF adjacency of the *wh*-feature to its category. The feature movement, which he calls Move F, and PF adjacency are defined in (12a) and (12b), respectively:

(12) 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; F enters into a checking relation with an uninterpretable feature of H.

(Agbayani (2006:79))

b. X and Y are PF adjacent if no phonological features invervene between X and Y. (Agbayani (2006:81))

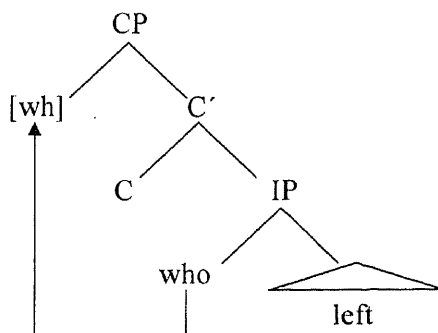As alluded to above, in the licensing mechanism of the *wh*-subject, there is a

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[8] One may suggest that the representation created by the feature movement can be essentially similar to that created by the category movement, an instance of which is the representations of sentences (9). If this is the case, the former representation is incompatible with the fact that the stressed preposition in the swiping sentence must be located in the rightmost position within the PP. Put more specifically, it is unclear how the *wh*-item with scattered features is insensitive to the application of rules (10). As a possible solution, I stipulate that a trace, which is currently understood as a copy, is different in quality from an item with scattered features, and that the structure including the latter is reanalyzed into one where the item has no particular position at the level where the stress is assigned to some element. This stipulation may be reasonable, given that an item with scattered features can never be pronounced, while a copy can in principle be. Since it is not my main concern here to deal with this in full detail, I omit any further discussion.

condition that the *wh*-feature and its category must be adjacent at PF. For convenience, I refer to the condition as the PF adjacency condition.

According to his proposal, for instance, sentence (13a) is derived as in (13b):

(13) a.   Who left?

b.

(Agbayani (2006:82))

It is generally assumed that the functional category C has an uninterpretable feature, specifically, Q-feature (cf. Chomsky (2000)). For the purpose of feature checking, some element with a *wh*-feature needs to move to the Spec of CP. At this point, an economy condition must be met which prefers the movement of some feature to that of its entire category. Thus, in (13b), Move F applies to the *wh*-subject *who*, with only the *wh*-feature moving to the Spec of CP. Note here that the functional category C is not pronounced, i.e., has no phonological feature. It follows, then, that the *wh*-feature and its category is adjacent at PF and the PF adjacency condition is satisfied.

Agbayani's framework allows us to implement the strategy referred to in the last subsection: If swiping is licensed in the same way as a *wh*-subject, the *wh*-element selected by the preposition in the swiping sentence need not move entirely at narrow syntax, and the well-formedness of the sentence depends on its PF representation. In the next subsection, I will present the derivation of swiping within his framework.
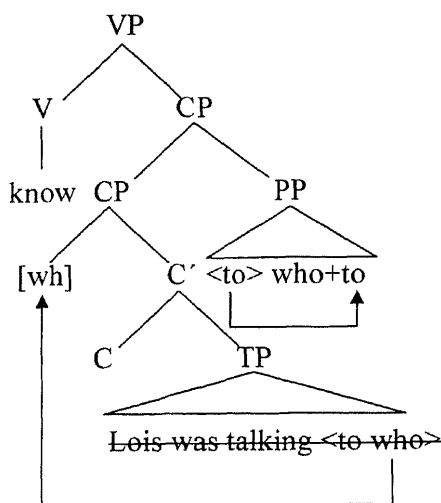
3.3.   The Derivation of Swiping

I propose that the derivation of swiping proceeds as follows:[9]

(14) a.   Lois was talking, but I don't know who to.   (= (1a))

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[9] The phrase marker in (14b) shows the relevant portion of the overall structure of sentence (14a).

b.

First, in order to check the Q-feature of the functional category C, the *wh*-feature of *who* moves to the Spec of CP. Second, the PP *to who* right-adjoins to the CP.[10, 11] Third, in PF, the TP-deletion takes place. Finally, in the adjoined PP, the preposition moves to the right in PF, so that it lies on the right side of *who*.[12] Note that at this point of the derivation, there is no intervening element between the *wh*-feature and *who*, thus the derivation converges, with no violation of the PF adjacency condition.

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[10] This movement of the PP is essentially the same as PP Extraposition in Hasegawa (2006) and PP-shift in Nakao (2007). Following Nakao, I assume that the movement does not leave a copy, although for expository purpose, I indicate the original position of the PP with a standard notation representing copies.

[11] A reviewer suggests that at this point of the derivation, there seems to be no reason to exclude the application of Pied-Pipe proposed in Agbayani (2006), which is given in (i):

    (i)   *Pied-Pipe*
        Category α is pied-piped to Spec, H.

                                         (Agbayani (2006:79))

Agbayani states that this operation applies to a structure in which a *wh*-feature moving to the Spec of CP and its category are not adjacent, in order to satisfy the PF adjacency condition. The reviewer points out that the application of Pied-Pipe here is strongly motivated, since at this point, they are nonadjacent.

    From the discussion in 3.1, it is clear that this possibility should be ruled out, because the combination of Move F and Pied-Pipe is equal to the *wh*-category movement. It is worth noticing here that Hasegawa (2006) and Nakao (2007) propose PP Extraposition and PP-shift, respectively, in addition to the *wh*-category movement. This means that they produce a different semantic and/or phonological effect from the *wh*-category movement. In order to achieve it in the derivation in (14b), some counterpart of PP Extraposition or PP-shift, i.e. the right-adjunction to CP, is necessary. Furthermore, in light of the fact that the *wh*-feature movement in (14b) plays essentially the same role as the *wh*-category movement, there is no necessity for Pied-Pipe to be applied in the derivation in (14b).

[12] For the justification of this movement, see section 4.

The adequacy of this derivation must be assessed by how well it captures the properties of swiping described in section 2. Thus, in the next section, I will show that they can be explained by the proposed derivation.

4. Explanation

In this section, I will examine whether the properties of swiping follow from the derivation proposed in the last section.

Let us first focus on the first property, i.e. the fact that the *wh*-elements occurring in swiping sentences cannot be only heads but phrases. To emphasize distinctness of my analysis, it is worthwhile to summarize Merchant's (2002) analysis. Merchant formulates the minimality condition, which is already given in (3), and accounts for it by assuming that the *wh*-element head-adjoins to the selecting preposition at PF. Note that since this movement is a head movement, the *wh*-element must be a head. Given the acceptability of the sentences in (4), however, it is obvious that Merchant's analysis is empirically inadequate, because the *wh*-elements included in (4) are phrasal. The crucial problem is that it has no mechanism for deriving such sentences as (4). In contrast, in the derivation depicted in (14b), in which the movement of the preposition is postulated instead of the PF head movement of the *wh*-element, there is no restriction on the types of wh-elements. Thus, my analysis is empirically desirable in that it can generate both the sentences in (2a-g) and (4).[13]

Next, I turn my attention to the second property, i.e. the sluicing condition stated in (6). In the proposed derivation, this condition can be reformulated in terms of the PF adjacency condition. Recall that in (14b), by virtue of the deletion of the TP (and the PF movement of the preposition), there is no intervening element between the *wh*-feature and its category. Generalizing from this example, it is natural to state that TP-deletion is a sufficient condition for satisfying the PF adjacency condition. Given this statement, let us consider examples which do not satisfy the sluicing condition, especially the sentences in (5b, c), repeated as (15):[14]

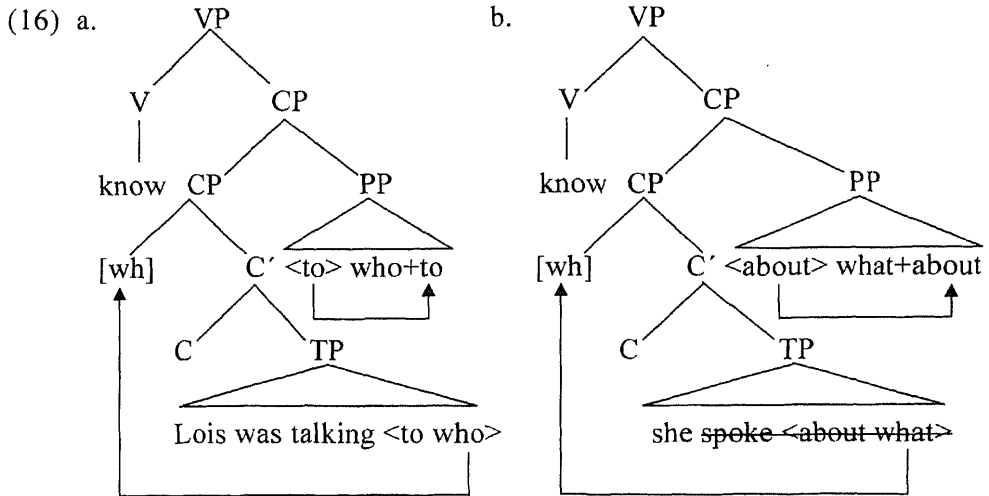(15) a. *I don't know who to Lois was talking.

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[13] While Merchant's (2002) analysis suffers from the undergeneration problem, my analysis has the overgeneralization problem: It cannot rule out the sentences in (2h-j). Put differently, it cannot account for the fact that not all phrasal *wh*-elements can occur in swiping. Unless some specific filter is proposed which rules out such sentences, my analysis does not always work properly. In addition, my analysis cannot account for the idiolectal variation on the judgment of the sentences in (2e-g). I leave these issues open for future research.

[14] The unacceptable sentences in (15) are derived within Merchant's framework. The proposed derivation, on the other hand, cannot generate such sentences at all for the reason mentioned just below.

b. *We know when she spoke, but we don't know what about she did.

As already mentioned, sentence (15a) is a nonelliptical question and sentence (15b) is a question involving VP-deletion. Within the proposed derivation, they must be derived as in (16a, b), respectively:

(16) a.

In (16a), since no deletion operation is applied, every component in the structure remains intact, and in (16b), only *she* in TP still remains, with VP-deletion applied. It is clear that in each structure, even after the movement of the preposition at PF, an intervener exists between the *wh*-feature and the *wh*-element; TP as a whole in (16a), and *she* in (16b). This situation, of course, is a violation of the PF adjacency condition, hence the unacceptability of sentences (15).

Alternatively, one might argue that if the *wh*-element in each structure in (16) also moves to the Spec of CP, the PF adjacency condition can be satisfied. In fact, as mentioned in note 11, Agbayani (2006) proposes the operation Pied-Pipe, an application of which yields the movement in question. More relevant to the discussion here is that it must be local. In (16), since the PPs right-adjoin to the CP, the movement of the *wh*-elements in the PPs to the Spec of CP is not local at all. This way, the neither option can guarantee the PF adjacency between a *wh*-feature and its category, and the derivation proposed in the last section can explain the sluicing condition in (6).[15]

At this point, I have the two properties left to be explained; specifically, the

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[15] Strictly speaking, as for the other unacceptable examples in (5), it is impossible to confirm whether my explanation of the sluicing condition is also reasonable, simply because of a paucity of knowledge of how these particular sentences are derived. It is, of course, outside the scope of this paper to propose the derivation of them. However, it is very unlikely that it involves TP-deletion, which is essential in deriving swiping sentences, more specifically, in satisfying the PF adjacency condition.

fact that the preposition selecting the *wh*-element bears stress and the fact that the content of it must be focalized.   Trivially, there is a close connection between them: Focalization of the preposition motivates the strong pronunciation of it.   Thus, it is natural to explain one property in association with the other property.

What then in the proposed derivation establishes the focus status of the preposition?   Hasegawa (2006) assumes that PP Extraposition plays this role.   He gives an example which supports this assumption.   Consider the following sentences:

(17) a.   *Someone talked to John, but don't know who [to John].

b.   ?Someone talked to John about something, but I don't know who [about what].

(Hasegawa (2006:443))

Hasegawa attributes the difference in the acceptability of the sentences in (17) to the presence or absence of PP Extraposition.   In (17a), in the absence of the operation, the bracketed PP is just a repetition of the PP in the left conjunct, and therefore it cannot be a focus element.   This is why the sentence is unacceptable.   On the other hand, sentence (17b) is much more acceptable than sentence (17a), in spite of the fact that the bracketed PP here as well apparently has its antecedent in the left conjunct.   This improvement must be due to some operation which avoids the repetition observable in (17a) and guarantees the focus status of the bracketed PP. He argues that it is PP Extraposition that achieves this.   Recall that in note 10, I assumed that it almost corresponds to the right-adjunction to CP in the proposed derivation.   Given this assumption, it follows that the right-adjunction to CP plays the role to assign the focus status to the PP in the proposed derivation, and it can account for the fourth property, i.e. the fact that the content of the preposition in the swiping sentence must be focalized.

Here, a question to be answered arises, which is related to the third property: Why is only the preposition stressed within the focalized PP?   Given the sentence-final stress observable in English, in the PP, the stress should be on the *wh*-element, rather than the preposition.   Notice, however, that in the proposed derivation, the *wh*-element in the PP does not consist of a full set of features, since the *wh*-feature of it moves to the Spec of CP.   I assume then that it does not qualify as a lexical item, and consequently it is insensitive to stress assignment.[16]   The

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[16] This assumption seems to be consistent with Agbayani's (2006) motivation for proposing Pied-Pipe, which is already introduced in note 11.   Both of them are based on the idea that a feature and its category cannot be isolated to satisfy Full Interpretation principle.   In this regard, see also note 8.

remaining element in the focalized PP is the preposition, which is no doubt a lexical item. Taking this into consideration, I assume that in PF, the preposition moves to the right side of the *wh*-element, where the sentential stress usually falls. This assumption allows us to give a natural solution to the question stated above. Note in passing that as mentioned above, by virtue of this movement, the *wh*-feature and its category get adjacent to each other at PF, which results in the convergence of the derivation. It suggests that in my analysis, the second and third property of swiping is closely related.

To summarize, in this section, I have shown that the derivation proposed in section 3 provides an adequate explanation of the properties of swiping. This indicates it satisfies a necessary condition for any successful account of swiping.

5. Additional Advantages and Residual Problems

In this section, I will offer some other arguments for the proposed derivation of swiping and point out some problems for it.

5.1. *Some Advantages*

One of the major motivations for the P-stranding analysis of swiping is that it is found only in languages in which P-stranding is possible. In fact, Sugisaki (2007:4) states that it "opens up a way to capture the cross-linguistic generalization that swiping is restricted to P-stranding languages." Although I offered a critical evaluation of the P-stranding analysis in section 3, my proposed analysis is quite similar to it in that they both involve *wh*-movement from the complement position of a preposition, the difference being the types of the movement. There is not yet any complete proof that the movement of a *wh*-feature is a case of P-stranding, but it seems certain that the proposed analysis has a huge potential to account for the above generalization.[17]

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[17] Given the similarity of the proposed analysis to the P-stranding analysis, we can reasonably argue that it accounts for the facts which constitute evidence for the P-stranding analysis. The first fact is illustrated by the following sentences:
  (i) a.   Peter was talking, but I don't know {who / *whom} he was talking with.
       b.   Peter was talking, but I don't know {who / *whom} with.

(Hasegawa (2006:437))

In (ia), where P-stranding is involved, *who* is infinitely preferable to *whom*. In the swiping sentence in (ib), the same *wh*-element occurs again.
    Another kind of fact is given below:
  (ii) a.   What did he do that for?   (≑ Why did he do that?)
       b.   He did it, but I don't know what for.

(Hasegawa (2006:435))

In (iia), in which the preposition *for* is stranded, the combination of the *wh*-element and the

The second advantage of the proposed analysis is that it gives a proper account of Nakao's (2007) observation. Nakao observes that there is a difference in the acceptability between pied-piped sluicing sentences and swiping sentences. Consider the following examples:

(18) a. *John wants to hire someone who fixes cars with something, but I don't know with what.

b. (?)John wants to hire someone who fixes cars with something, but I don't know what with.

(Nakao (2007:42), with slight modifications)

Sentence (18a) is an instance of pied-piped sluicing and sentence (18b) that of swiping. The expressions *with what* in (18a) and *what with* in (18b) are semantically related to the PP *with something* in the first conjunct, which functions as an adjunct. In light of this, it is unclear where the difference in the acceptability between the sentences in (18) comes from. The question becomes more specific, given Nakao's observation that while argument sluicing out of a complex NP is possible, adjunct sluicing out of it is not. It is illustrated by the following sentences:

(19) 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 (exactly) know how.

(Nakao (2007:40), with slight modifications)

It is remarkable that we can observe the difference in the acceptability between the sentences in (19b, c) and sentence in (18b), since all of them apparently involve adjunct sluicing out of the complex NP. Even more important to notice is the acceptability of the sentence in (18b) and that in (19a), because it suggests sentence (18b) actually involves argument sluicing out of the complex NP.

Nakao presents an explanation for the (un)acceptability of the sentences in (19) based on the ECP. To give an outline of it, let us consider the partial representations associated with the sentences in (19a, b), as shown in (20):

(20) a. I don't know what$_i$ John wants to hire someone who fixes cars with t_i.

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preposition is almost synonymous to *why*. Interestingly, the same interpretation is also available in the combination of sentence (iib).

b. *I don't know why$_i$ John wants to hire someone who fixes cars t_i.

(Nakao (2007:41), with slight modifications)

Nakao attributes the difference in the acceptability to the fact that while the trace in (20a) is lexically governed by the preposition *with*, that in (20b) is not properly governed by anything.[18] Applying this explanation to sentence (18b), we can expect that it has a similar representation to that of sentence (19a), in which the preposition lexically governs the trace.

The proposed derivation can yield the required representation: Even though *wh*-feature movement to the Spec of CP occurs, its category is governed by the preposition selecting it. Notice that the rightward movement of the preposition takes place at PF, and the linear order of it and its object is as usual at narrow syntax and LF. Thus, the feature movement does not induce any ECP violation, and the derivation can correctly predict the acceptability of the sentence in (18b).[19]

5.2. Some Residual Problems

It is of importance to identify problems left unsolved at this moment, which naturally encourage further research of swiping. The proposed derivation seems to suffer from the absence of theoretical justification and an empirical shortcoming.

Let us first discuss the theoretical issue. In the derivation proposed in section 3, it includes an apparently inadmissible operation, i.e. right-adjunction of the PP to CP. The problem is that an element without a complete set of features moves. Whether this kind of movement is available or not must be empirically proved, but unless we can now find any other linguistic phenomena accounted for by such movement, this theoretical tool has a strong ad hoc character. Moreover, given Chomsky's (2005) 'no-tampering condition' in (21), no feature movement is possible.

(21) no-tampering condition (NTC):

Merge of X and Y leaves the two syntactic objects unchanged.

(Chomsky (2005:5))

If this condition is on the right track, it poses a fundamental problem to the proposed derivation. In feature research, we need to explore the possibility of achieving a good balance between the two proposals.

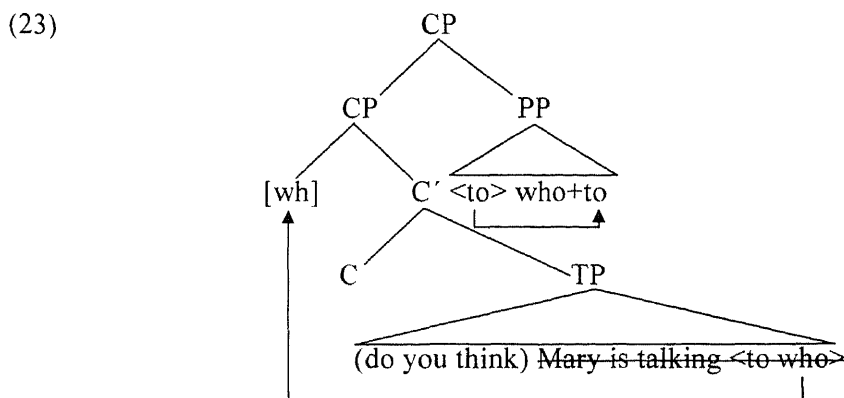Let us turn to the empirical problem. The following example illustrates it:

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[18] Nakao and Yoshida (2006) assume that the trace in propositional islands such as complex NPs cannot be governed by its antecedent.

[19] Alternatively, assuming that feature movement does not leave any trace, we can argue that the movement in question induces no ECP violation.

(22) A: Mary is talking.

B: Who do you think to?

(Hasegawa (2006:436))

A striking difference between the example of swiping in (22) and all other instances given above is the presence or absence of an intervening expression between the *wh*-element and the preposition. It should be noted that the proposed mechanism cannot derive the example in (22). To confirm this clearly, observe the process of the derivation of it, given below as (23):

(23)

In (23), only the lower TP is deleted, with the upper TP *do you think* intact. As is visually displayed, the *wh*-feature in the Spec of CP and its category is not adjacent at PF and the derivation violates the PF adjacency condition. Hence, it cannot converge. To generate such swiping sentences in matrix clauses as well as those in embedded clauses, we must make some auxiliary assumptions.[20]

In summary, in this section, I provided further arguments for the derivation proposed in section 3, and discussed the theoretical and empirical issues involved in it in some detail.

6. Conclusion

My purpose in this paper has been to present a feature movement analysis of swiping, which differs from previous analyses in that they involve *wh*-category movement. I have shown that the proposed derivation can explain the properties of swiping, and capture the cross-linguistic generalization concerning swiping and the absence of the ECP violation in the swiping sentence. Finally, I have pointed out

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[20] Given Hasegawa's suggestion, originally pointed out by a reviewer of his paper, that the expression *do you think* might be a parenthetical element, the assumptions could be simply redundant. Because of its somewhat optional nature, the *wh*-feature and its category in (23) could be said to be adjacent.

some theoretical and empirical problems to be addressed in future research.

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