Volume 13 *2007*
Issue 1 *Proceedings of the 30th Annual Penn Linguistics Colloquium*
Article 21

2007

A/A'-Asymmetries: Finiteness sensitivity in Wh-movement

Miki Obata

A/A'-Asymmetries: Finiteness sensitivity in Wh-movement

A/A'-Asymmetries: Finiteness Sensitivity in Wh-movement

Miki Obata*

1 Introduction

In this paper I focus on so-called Tense-island effects as shown in the following paradigm:

(1) a. *Which book/what did John ask Mary [when he should buy _]?
    b. Which book/what did John ask Mary [when to buy _]?

In (1), wh-extraction out of a finite wh-clause is much more degraded than the one out of an infinitival wh-clause despite the fact that wh-islands are involved in both cases. This contrast implies that finiteness in wh-clauses might have some effect on deciding whether or not movement is allowed.

However, there are some data which seem to show that finiteness is not the only factor giving rise to the contrast in (1). In this paper, I propose that Tense-island effects are observed only in A-to-A' movement, not in A'-to-A'-movement (A/A'-asymmetries). Moreover, I suggest that this observation can be induced from slight modifications of the probe-goal system in Chomsky (2000) and the Case-system proposed in Pesetsky and Torrego (2001, 2002, 2004).

2 How to Derive Tense-Island Effects

Since Ross (1967), locality of movement has been discussed from various points of view. In particular, the central concern is how to derive the same effects as Ross' islands without actually referring to "islands."

*I am very grateful to Jim McCloskey and Koichi Takezawa for their invaluable comments and suggestions on several points in this paper. I would also like to thank Tomohiro Fujii, Yukio Furukawa, Norbert Hornstein, Tomohiko Ishimori, Howard Lasnik, Haruko Matsui, Chizuru Nakao, Jon Nissenbaum, Jairo Nunes, Hajime Ono, David Pesetsky, Norvin Richards, Mina Sugimura, Yuji Takano, Lisa Travis, Masaya Yoshida and the audience at the 30th Penn Linguistics Colloquium and at McGill University. I also thank Stacey Conroy, Scott Fults, Moti Liberman, Rebecca McKeown and Philip Monahan for judgment of English examples. But all remaining errors and inadequacies are my own.

Barriers, proposed in Chomsky (1986), is one of the intriguing works on locality of movement. Unlike the bounding node type approach suggested in Chomsky (1973), every maximal projection potentially becomes a barrier for movement in this system. That is, *Barriers* can derive island effects without specifying the categories of the bounding node.

On the other hand, the system seems to have trouble in dealing with Tense-island effects. The set of basic assumptions of *Barriers* is not equipped with a device to distinguish between finite clauses and infinitival clauses. Under this system, the contrast observed in (1) becomes problematic as follows[1]:

(2) a. ??Which book did [$_{IP}$ John [$_{VP}$ t_{which} [$_{VP}$ ask Mary [$_{CP}$ when [$_{IP}$ he should [$_{VP}$ t_{which} [$_{VP}$ buy t_{which} t_{when}]?
b. Which book did [$_{IP}$ John [$_{VP}$ t_{which} [$_{VP}$ ask Mary [$_{CP}$ when [$_{IP}$ to [$_{VP}$ t_{which} [$_{VP}$ buy t_{which} t_{when}]?

In (2a), "which book" is first adjoined to the embedded VP. Since the embedded [Spec,CP] is already filled with another wh-phrase, "which book" is adjoined to the matrix VP at the second step of movement.[2] At this point of the derivation, the moved wh-phrase crosses one barrier, because IP is not L-marked with C, and CP, which immediately dominates IP, becomes a barrier. In terms of Subjacency, the system predicts that (2a) has a weak island violation. On the other hand, (2b) is better than (2a) despite the fact that they are structurally the same. The only difference is finiteness in the embedded clauses. This point becomes an obstacle in the *Barriers* framework. In order to capture the contrast observed in (2), Chomsky stipulates that tensed IP is an inherent barrier (possibly weak) to wh-movement, this effect being restricted to the most deeply embedded tensed IP (Chomsky 1986:37). With this stipulation, the second step of movement in (2a) crosses two barriers at once: the lowest tensed IP and the barrier (CP) by inheritance. On the other hand, the lowest embedded clause is not tensed in (2b). Therefore, the wh-phrase crosses only one barrier (CP) at the second step, and the system predicts the contrast in (2). As mentioned earlier, the underlying spirit of *Barriers* is to derive locality effects without specifying certain categories. With respect to Tense-islands, however, a specific category, the most deeply embedded IP, has to have a special status against this spirit.

Manzini (1992) also discusses this problem. Roughly speaking, she ar-

---

[1]In (2), I will abstract away from movement of "when" in order to make the discussion simpler.

[2]Chomsky (1986:32) stipulates that wh-phrases may not adjoin to IP, then move to [Spec,CP].

gues that the [+Tense] feature on T blocks a sequence (or dependency) between a moved wh-phrase and its trace but [–Tense] does not. Manzini's system successfully captures Tense-islands without specifying a certain category by assuming Address-based dependency and Categorial index dependency, although I do not review the details here because of space limitations.

We have briefly summarized Chomsky (1986) and Manzini (1992). Although their arguments are different in many aspects, it seems that a common stance on Tense-islands is taken in both approaches: a finite T strengthens island violations but an infinitival T does not. Notice that their approaches refer only to finiteness in order to deal with the contrast at issue. Keeping this point in mind, let us take a look at some problematic cases for these two approaches.

3 New Observations on Tense-Islands: A/A'-Asymmetries

In this section, we will give further consideration to Tense-island effects. Two problematic cases in the existing analyses are presented and it is suggested that Tense-island effects involve additional factors beyond finiteness.

3.1 Problematic Cases

First of all, let us return to the basic data set:

(3) a. ??Which book did John ask Mary [when he should buy t_{which} t_{when}]?
    b. Which book did John ask Mary [when to buy t_{which} t_{when}]?

As we have already discussed, the contrast in (3) sets up a generalization that an infinitival T ameliorates wh-island violations (or a finite T strengthens the violation). However, the story behind Tense-island effects is not that simple.

First, if an adjunct wh-phrase is extracted out of a wh-clause, the sentences are unacceptable regardless of finiteness, as in (4).

(4) a. *How did John wonder where he should buy the book t_{where} t_{how}?
    b. *How did John wonder where to buy the book t_{where} t_{how}?

If finiteness is the only factor in giving rise to the contrast in (3), (4) is supposed to show the same contrast as (3). However, both (4a) and (4b) are equally unacceptable. In this case, an infinitival T does not ameliorate the island violation for some reason. In (4), moreover, a wh-phrase "how" is extracted out of the "lowest" clause. Remember Chomsky (1986) refers to the "most deeply embedded" tensed IP to capture the island effects. However, the contrast in (4) shows no finiteness sensitivity despite the extraction out of the lowest clause. This tells us that the "most deeply embedded" tensed IP is not likely to be a factor involved in Tense-island effects. The only difference between (3) and (4) is that an extracted wh-phrase is an argument in (3) and an adjunct in (4). That is, argument/adjunct-asymmetries are observed. However, the following example challenges this observation.

(5) a. *Which book did Bill ask Susan [when to decide t_{when} [to buy t_{which}]]? [3]
b. ?Which book did Bill decide [to ask Susan [when to buy t_{which} t_{when}]]?

Interestingly, the sentence in (5a) is much worse than (5b) despite the fact that the embedded clauses are all infinitival. If Tense-island effects are due only to finiteness, both sentences ought to show the same acceptability. However, this is not the case. Furthermore, if argument/adjunct asymmetries are really observed as discussed in (4), it is still mysterious why the contrast in (5) is obtained, where the extracted wh-phrases are arguments.

The above discussions tell us that finiteness is not the only factor in Tense-island effects. At the same time, the previous approaches fail to capture the data in (4)-(5) because of some additional factors. Now, let us go into a discussion to clarify the factors.

3.2 New Observations: A/A'-Asymmetries in Tense-Island Effects

Consider the data in (5) again from a different point of view. I will put aside the adjunct case in (4) for the time being. If we put the data in (5) in the following context, an interesting contrast comes out. ((5) is repeated as (7) below.)

(6) finite-infinitival
a. *Which book did John ask Mary [when he should decide t_{when} [to buy t_{which}]]?
b. ?Which book did John decide [he should ask Mary [when to buy t_{which} t_{when}]]?

(7) infinitival-infinitival
a. *Which book did John ask Mary [when to decide t_{when} [to buy t_{which}]]?

[3]Richards (2002:240) also presents the same type of data. However, he develops an analysis different from the one presented in this paper.

b. ?Which book did John decide [to ask Mary [when to buy t_{which} t_{when}]]?

(8) infinitival-finite

a. *Which book did John ask Mary [when to decide t_{when} [he should buy t_{which}]]?

b. *Which book did John decide [to ask Mary [when he should buy t_{which} t_{when}]]?

(9) finite-finite

a. *Which book did John ask Mary [when he should decide t_{when} [he should buy t_{which}]]?

b. *Which book did John decide [he should ask Mary [when he should buy t_{which} t_{when}]]?

Let us pay attention to the positions of wh-islands. In the (a) sentences, the wh-islands are in the second clauses, while in the (b) sentences, they are in the lowest clauses. (6b) and (7b) are (marginally) acceptable, but all the others are unacceptable.

First, consider the (b) sentences. Notice that both the original position (Case-marked position) of "which book" and the wh-island are included in the same clause. This implies that "which book" crosses the wh-island in the step from an A-position to an A'-position as in the following configuration:

(10) [which book . . .[$_{CP}$ . . . [$_{CP}$ when . . . t]]]

Comparing (6b)/(7b) and (8b)/(9b), it is obvious that the step crossing the islands shows finiteness sensitivity: (6b) and (7b) are acceptable, where the wh-clauses are infinitival, while (8b) and (9b) are unacceptable where the wh-clauses are finite. Therefore, we can conclude that finiteness has an influence on A-to-A'-movement. Next, consider the (a) sentences. In this case, the original position of "which book" and the wh-island are not in the same clause, unlike the (b) sentences: the former is in the lowest clause, while the latter is in the second clause. This implies that "which book" crosses the wh-island when it moves from an A'-position ([Spec,CP]) to an A'-position ([Spec,CP]) as in the following configuration:

(11) [which book . . .[$_{CP2}$ when . . . [$_{CP1}$ . . . . t]]]

Since "which book" first lands at [Spec,CP1], it crosses the island in the step from an A'-position to an A'-position. Comparing (6a)/(9a) and (7a)/(8a), the wh-clause in the former case is finite and the one in the latter case is infinitival. These examples are all unacceptable despite the fact that finiteness is different in each case. That is, A'-to-A' movement does not show finiteness sensitivity, in contrast to A-to-A' movement in cases like (b).[4]

Recall that the contrast in (7) was a problematic case in Chomsky (1986) and Manzini (1992), where it is argued that finiteness is the only factor in Tense-islands. However, these sentences are no longer problematic in our view. In (7a), an infinitival T does not rescue the island violation because the wh-island is crossed in A'-to-A' movement, which shows no finiteness sensitivity. In (7b), on the other hand, the wh-island is crossed in A-to-A' movement, which shows finiteness sensitivity. Therefore, an infinitival T can salvage the island violation. Our view based on A/A'-asymmetries enables us to describe the contrast in (7).

Furthermore, if an adjunct wh-phrase is extracted out of a wh-clause, the sentence becomes unacceptable regardless of finiteness, as already discussed in the previous section.

(12) a. *How did John wonder where he should buy the book t_{where} t_{how}?
 b. *How did John wonder where to buy the book t_{where} t_{how}?

Note that adjunct wh-phrases are in A'-positions from the beginning and every step of the movement is from an A'-position to an A'-position. As mentioned in the previous discussion, A'-to-A' movement does not show finiteness sensitivity. Therefore, our generalization successfully describes the data in (12).

In this section, we have considered the relations between Tense-island effects and A/A' distinctions. Based on the wh-island cases, we obtained the following generalization: A-to-A' movement is sensitive to finiteness, while A'-to-A' movement is not sensitive to finiteness.[5,6] This tells us that

[4]Richards (2002:240) shows the following three sentences:

(i) a. What are you wondering how to try to repair_?
 b. *What are you wondering how John tried to repair _?
 c. *What are you wondering how to persuade John to repair _?

According to Richards, (ia) is better than (ic) and (ic) is better than (ib). Our generalization cannot predict the contrast between them. It wrongly predicts that they are all ungrammatical. This data set could tell us that Tense-island effects involve an additional factor beyond A/A'-asymmetries and finiteness.

[5]The same generalization is maintainable in *tough*-constructions under the null operator movement analysis discussed in Chomsky (1977) and Browning (1987), although subtle judgment is required.

(i) a. John is easy (for us) to convince Bill to arrange for Mary to meet.

Tense-island effects are due not only to finiteness but also to A/A' distinctions.

4 Alternatives: T-Relatedness and Feature Lifespan

In this section, I will suggest an alternative explanation for Tense-island effects. In order to capture the generalization we obtained, let us briefly review the following three points: properties of A'-movement, T-features, and the probe-goal system.

4.1 Properties of A'-Movement: A/A' distinctions

First of all, we need to consider some differences between A-movement and A'-movement. What distinguishes between A-movement and A'-movement? The landing site determines which type of movement is taking place: if the landing site is an A-position, the movement is A-movement, or if an A'-position, it is A'-movement. On the other hand, the launching site can vary. A'-movement can start from either an A-position or an A'-position, while A-movement can start only from an A-position.

In the case of successive cyclic A'-movement, only the chain formed by the first step holds information on the launching site in that all other steps start from intermediate landing sites ([Spec,CP]). Moreover, only in the first step of A'-movement, movement from an A-position to an A'-position is allowed. If it occurs in other steps, it causes improper movement. In these senses, it seems that the first step of A'-movement has a special status.[7]

4.2 Pesetsky and Torrego (2004): T-Features and Feature Lifespan

In the above section, we discussed the fact that the first step of A'-movement may have a special status. Now, let us consider what happens between the first step and the second step in terms of "feature lifespan". Pesetsky and

---

b. ??John is easy (for us) to convince Bill to tell Mary that Tom should meet. (Chomsky 1977:103–104)

c. John is easy (for us) to convince Bill that he should arrange for Mary to meet.

[6]One consequence we can obtain from the generalization is that the cycle (or phase) of (wh-)movement is only CP, not vP. This is also supported by the data presented in McCloskey (2000), Simpson and Wu (2002) and others. See Obata (to appear) for more detailed discussion on this consequence.

[7]See Obata (to appear) for more detailed discussion on the properties of A'-movement.

Torrego (2004) (henceforth P&T) suggest that "at the end of the CP phase, uninterpretable features are deleted if they are valued (P&T 2004:15)".[8] Under this assumption, features on an argument wh-phrase are valued and deleted step by step as follows:[9]

(13) What do you think John bought _?
(What$_3$ do you think <what$_2$> John bought <what$_1$>?)

(14) [uT] on "what"
a. what$_1$: ~~[uT]~~ [uQ]
b. what$_2$: [---] ~~[uQ]~~
c. what$_3$: [---] [---]

First, "what" is merged in a complement position of "bought". At this site, [uT] on "what" is valued by T. Since "what" has another uninterpretable feature [uQ] which has to be valued by [+Q]C, it moves to the phase edge as shown in "what$_2$" in (13). The derivation proceeds to the next CP phase. Note that ~~[uT]~~ on "what$_2$" is deleted as in (14b) before the computation in the matrix clause starts. The matrix [+Q]C agrees with "what$_2$" and attracts it to [Spec,CP]. What happens between the first step and the second step? Before the second step of movement, [uT] on "what$_2$" is deleted. In other words, a wh-phrase holds a Case feature only in the first step, not in the other steps. In terms of T-features, a wh-phrase loses a valued [uT] after the first step of movement. Therefore, a wh-phrase changes from a "T-related" element to a "non-T-related" element after the first step but before the second step.[10,11] In conclusion, we can induce the special status of the first step from Feature Lifespan in P&T: the reason the first step of A'-movement has a special status is that a Case-feature on a moved element can be maintained only in the first step, not in other steps.

[8]However, P&T (2001) argue that the feature lifespan is determined on the basis of the availability of the EPP property. In this paper, I will adopt P&T's (2004) version of feature deletion: valued uninterpretable features are deleted at the end of the CP cycle. Due to space limitations, I do not discuss this problem here.

[9]I will adopt the Case-system proposed in P&T: an argument must bear T (uT or iT) (P&T 2002:501).

[10]I will call elements holding T-features "T-related" elements.

[11]Note that an adjunct wh-phrase does not have [uT] from the beginning. In this sense, the first step of an adjunct wh-phrase does not have a special status. This difference enables us to capture A/A'-asymmetries observed in Tense-islands. In 4.4, we will discuss this issue.

4.3 Ramifications of Feature-Matching

Let us consider the probe-goal system proposed in Chomsky (2000). He assumes the following three points for the probe-goal system:

(15) a. Matching is feature identity.
b. D(P) (the domain of a probe) is the sister of P.
Locality reduces to "closest c-command." (Chomsky 2000:122)

Following these assumptions, a probe searches a goal and establishes the Agree relation to the goal. Let us imagine that two potential goals are in the same domain as follows:

(16) $P_{[\alpha]} > G_{1[\alpha]} > G_{2[\alpha]}$
(17) $P_{[\alpha][\beta]} > G_{1[\alpha]} > G_{2[\alpha][\beta]}$

In (16) and (17), P c-commands G1 and G1 c-commands G2. In (16), a feature on P matches features on both G1 and G2. In this configuration, P chooses G1 as a goal based on the assumption of the closest c-command in 0). (17) has the same c-commanding relation as (16). However, the feature distribution is slightly different from the previous case. P has two features, [α] and [β]. G2 also has both of them, but G1 only has one of them. In terms of the feature-matching, P matches G2 better than G1. In terms of the closest c-command, on the other hand, P c-commands G1 more closely than G2. Which one should be chosen as an appropriate goal? Let us say that both G1 and G2 can be goals of P in (17).[12,13]

Finally, we will consider how to capture finiteness sensitivity. If P&T's system is on the right track, DP and C as well as T all have T-features (i.e., T-related elements). Under this assumption, suppose that [+finite]T blocks the Agree relation in the following configuration:

(18) $P_{[T]}$ T[+finite] $G_{[T]}$

[12]Jim McCloskey (p.c.) suggested to me the basic idea of feature-matching ramifications.

[13]Our version of the probe-goal system raises interesting consequences for the disappearance of superiority effects in the following sentences:
(i) a. I am wondering where you bought what.
b. I am wondering what you bought where.
See Obata (2006) for details.

If both probe and goal are T-related elements, the Agree relation between them is blocked by [+finite]T.

4.4 Treatment of Tense-Island Effects

Now, let us consider the actual derivations for Tense-island effects based on what we have discussed in the previous sections. Due to space limitations, I will show only the derivations for the following data sets. As I already mentioned, (20) and (21) were problematic cases in the previous approaches.

(19) a. ??What did John ask Mary where he should buy _ _?
b. What did John ask Mary where to buy _ _?
(20) *Which book did John ask Mary [when to decide t_{when} [to buy t_{which}]]?
(21) a. *How did John wonder where he should buy the book t_{where} t_{how}?
b. *How did John wonder where to buy the book t_{where} t_{how}?

First, consider the derivation for the paradigm in (19). "What" is extracted out of a finite clause in (19a) and out of an infinitival clause in (19b).

(22) ??What did John ask Mary where he should buy _ _?
Step1 [$_{CP}$ he $C_{[EPP][iQ]\cancel{[uT]}}$ <he> should buy $what_{[uQ]\cancel{[uT]}}$ $where_{[uQ]}$]
(C > where > what)
Step2 $C_{[EPP][iQ]\cancel{[uT]}}$ T[+finite] $where_{[uQ]}$ $what_{[uQ]\cancel{[uT]}}$
Step3 [$_{CP}$ $where_{\cancel{[uQ]}}$ he should buy $what_{[uQ]\cancel{[uT]}}$]
Step4 [$_{CP}$ did($C_{[EPP][iQ]\cancel{[uT]}}$) John ask Mary [$_{CP}$ $where_{[---]}$...$what_{\cancel{[uQ]}[...]}$]]

(22) is the derivation for (19a). At Step1, [uQ] on wh-phrases has to be valued by Agree with [iQ] on C. As shown in Step2, C (a probe) has two potential goals, "where" and "what". In terms of feature-matching, C matches "what" better than "where". In terms of closest c-command, on the other hand, C c-commands "where" more closely than "what". Under our version of the probe-goal system in (17), both "where" and "what" can be goals of the probe C. However, the embedded clause is [+finite]. As discussed in (18), Agree between T-related elements cannot take place across [+finite]T. Therefore, Agree between C and "what" is blocked by [+finite]T. Meanwhile, "where" is not a T-related element, and nothing prevents Agree between C and "where". At Step3, "where" is attracted to [Spec,CP] by the EPP feature. The derivation goes on to the matrix clause at Step4. The matrix [+Q]C is introduced to the derivation. Again, C has to look for a goal. Since [uQ] on

"what" is still active, the matrix C agrees with it. The EPP feature on the matrix C has to attract "what" after Agree, but the Phase Impenetrability Condition (PIC) prohibits this movement. As a result, the EPP feature on the matrix C remains undeleted and it causes the crash of the derivation.[14]

Let us consider (19b), where the embedded clause is infinitival:

(23) What did John ask Mary where to buy _ _?
Step1 $[_{CP}$ $C_{[EPP][iQ]\cancel{[uT]}}$ PRO to buy $what_{[uQ]\cancel{[uT]}}$ $where_{[uQ]}]$
(C > where > what)
Step2 $C_{[EPP][iQ]\cancel{[uT]}}$ T[-finite] $where_{[uQ]}$ $what_{[uQ]\cancel{[uT]}}$
Step3 $[_{CP}$ $what_{\cancel{[uT]}[uQ]}$ $where_{\cancel{[uQ]}}$ to buy _ _]
Step4 $[_{CP}$ did $(C_{[EPP][iQ]\cancel{[uT]}})$ John ask Mary $[_{CP}$ $what_{[uQ][---]}$ $where_{[---]}$]]
Step5 $C_{[EPP][iQ]\cancel{[uT]}}$ [+finite] $what_{[uQ][---]}$
Step6 $[_{CP}$ $what_{\cancel{[uQ]}[---]}$ $did(C_{\cancel{[EPP]}\cancel{[iQ]}\cancel{[uT]}})$ John ask Mary $[_{CP}$ $where_{[---]}$ ..]]

At Step1, [uQ] on wh-phrases has to be valued by [iQ] on C. As illustrated in Step2, "where" and "what" are possible goals of C (probe). Again, "where" is c-commanded by C more closely than the other is, but "what" matches C better than the other does. As mentioned in (17), both of them can become the goals. C and "what" are both T-related elements. Agree between them should be sensitive to finiteness. However, the embedded clause is not [+finite] but [-finite]. Therefore, T does not block the Agree relation between them. Although the embedded C agrees with both wh-phrases, C has a single [iQ]. Suppose that [uQ] on either of the wh-phrases is valued by [iQ] on C but the EPP feature on C can attract both of them.[15] At Step3, [uQ] on "where" is valued by C and [uQ] on "what" remains unvalued. Thus, EPP attracts both of the wh-phrases to the edge positions. The derivation proceeds to the matrix clause in Step4. Note that "what" at [Spec,CP] is no longer a T-related element because [uT] is already deleted at the end of the CP-cycle (but [uQ] is still active). At Step5, the matrix C agrees with "what". Since "what" is not a T-related element, this Agree relation is not sensitive to fi-

[14]Depending on how strong the PIC is, even Agree between C and "what" may not be allowed.

[15]I assume that [+Q]C can agree with multiple wh-phrases optionally. Therefore, the embedded C can agree with both wh-phrases in (23). If multiple Agree takes place in the embedded clause, however, the matrix [+Q]C does not have a goal for Agree and the EPP feature remains undeleted because it cannot attract an element. As a result, the derivation crashes. That is, the derivation in (23) can be convergent only if the embedded [+Q]C chooses a single Agree option, not a multiple Agree option.

niteness. The EPP feature on C attracts "what" to the edge position and the derivation converges.

Next, consider the derivation for (20). This sentence is one of the problematic cases for the previous approaches.

(24) *Which book did John ask Mary [when to decide t_{when} [to buy t_{which}]]?
Step1 [$_{CP}$ $C_{[-Q][EPP][\cancel{uT}]}$ T[-finite] $which_{[uQ][\cancel{uT}]}$]
Step2 [$_{CP}$ which $_{[uQ][---]}$ . . . . .]
Step3 [$_{CP}$ (he) $C_{[EPP][iQ][\cancel{uT}]}$ T[-finite] $when_{[uQ]}$ [$_{CP}$ $which_{[uQ][---]}$ . .]]
Step4 [$_{CP}$ $when_{[uQ]}$ C [$_{CP}$ $which_{[uQ][---]}$]]
Step5 [$_{CP}$ $C_{[EPP][iQ][\cancel{uT}]}$ T[+finite] [$_{CP}$ $when_{[---]}$ [$_{CP}$ $which_{[uQ][---]}$]

At Step1, the lowest CP is introduced to the derivation. Since C is marked with [-Q], it does not agree with a wh-phrase. The EPP feature attracts "which" to the edge position, as shown in Step2. [uQ] on "which" is not valued yet but [uT] is already deleted. At Step3, the next clause is introduced to the derivation. This clause includes another wh-phrase "when" and [+Q]C. Within the domain of [+Q]C, there are two [uQ]: "when" and "which". In terms of the closest c-command, C c-commands "when" more closely than "which". In terms of feature-matching, there is no difference between "when" and "which" because [uT] on "which" is already deleted and both wh-phrases only have [uQ]. Therefore, C has to choose [uQ] on "when" as a goal based on the closest c-command. As illustrated in Step4, "when" is attracted to the edge of CP after Agree. [uQ] on "which" still remains unvalued. At Step5, the matrix C is introduced. Since C is marked with [+Q], this can agree with [uQ] on "which". Again, the EPP feature cannot attract "which" because of the PIC. It causes the crash of the derivation.

Finally, let us see the adjunct case. This is also one of the problematic cases in the previous approaches.

(25) a. *How did John wonder [where he should buy the book t_{where} t_{how}]?
b. *How did John wonder [where to buy the book t_{where} t_{how}]?

(26) **Step1** $C_{[EPP][iQ][\cancel{uT}]}$ > $where_{[uQ]}$ > $how_{[uQ]}$
Step2 [$_{CP}$ $where_{[\cancel{uQ}]}$ C $how_{[uQ]}$]
Step3 [$_{CP}$ did ($C_{[EPP][iQ][\cancel{uT}]}$) [$_{CP}$ $where_{[---]}$ $how_{[uQ]}$]]

In (25), both wh-phrases are adjuncts and not T-related elements. In other words, Agree does not need to care about finiteness. As shown in Step1, C chooses [uQ] on "where" as a goal in terms of the closest c-command. At Step2, "where" is attracted to the edge position. [uQ] on "how" remains unvalued. At Step 3, the matrix [iQ] agrees with [uQ] on "how". Since the PIC prohibits the EPP feature from attracting "how", the derivation crashes.

In this section, we have considered how to capture Tense-island effects. The proposed system has assumed the following three points: [1] at the end of the CP phase, uninterpretable features are deleted if they are valued, [2] if both a probe and a goal are T-related elements, Agree cannot take place across [+finite]T and [3] in $\alpha > \beta > \gamma$, if γ matches α better than β does, both β and γ are equally available for Agree with α. Under these assumptions, Tense-island effects can be successfully captured. Also, it can be concluded that the discussion in this paper supports P&T's view: structural Case is an uninterpretable instance of T. The availability of T-features on D enables us to capture A/A' asymmetries in Tense-island effects.

5 Concluding Remarks

In this paper, we have discussed some properties of Tense-island effects. We obtained the following generalization: A-to-A' movement is sensitive to finiteness, while A'-to-A' movement is not sensitive to finiteness (A/A'-asymmetries). In other words, we have seen that A-to-A' movement has some different properties from A'-to-A' movement. Moreover, we showed that some existing approaches to Tense-islands do not straightforwardly capture these properties. In section 4, we suggested an alternative account to capture the generalization regarding Tense-islands: A/A'-asymmetries can be induced from the availability of Case-features on moved elements. By means of some devices suggested in P&T, we were able to successfully derive the data we discussed.

References

Browning, Marguerite. 1987. Null Operator Constructions. Doctoral dissertation, MIT.

Chomsky, Noam. 1973. Conditions on transformations. In *A Festchrift for Morris Halle*, ed. S.R. Anderson and P. Kiparsky, 232–286. New York, NY: Holt, Rinehart, & Winston.

Chomsky, Noam. 1977. On *wh*-movement. In *Formal syntax*, ed. P. Culicover, T. Wasow and A. Akmajian, 71–132. New York, NY: Academic Press.

Chomsky, Noam. 1986. *Barriers*. Cambridge, MA: MIT Press.
Chomsky, Noam. 2000. Minimalist inquiries: The framework. In *Step by Step*, ed. R. Martin, D. Michaels and J. Uriagereka, 89–155. Cambridge, MA: MIT Press.
Manzini, Rita. 1992. *Locality*. Cambridge, MA: MIT Press.
McCloskey, James. 2000. Quantifier Float and Wh-Movement in Irish English. *Linguistic Inquiry* 31:57–84.
Obata, Miki. 2006. Weakest island effects: On the properties of A'-movement. Handout presented at WCCFL25. Seattle. University of Washington.
Obata, Miki. To appear. Weakest island effects: On the properties of A'-movement. In *Proceedings of WCCFL25*.
Pesetsky, David, and Esther Torrego. 2001. T-to-C movement: Causes and consequences. In *Ken Hale: A Life in Language*, ed. M. Kenstowicz, 326–355. Cambridge, MA: MIT Press.
Pesetsky, David, and Esther. Torrego. 2002. Tense, case, and the nature of syntactic categories. In *The syntax of Time*. ed. J. Guéron and J. Lecarme, 495–538. Cambridge, MA: MIT Press.
Pesetsky, David, and Esther Torrego. 2004. The syntax of valuation and the interpretability of features. Ms., MIT and University of Massachusetts at Boston.
Richards, Norvin. 2002. Very local A'-Movement in a root-first derivation. In *Derivation and Explanation in the Minimalist Program*, ed. S.D. Epstein and T. D. Seely, 227–248. Oxford: Blackwell.
Ross, John Robert. 1967. Constraints on Variables in Syntax. Doctoral Dissertation, MIT.
Simpson, Andrew, and Zoe Wu. 2002. Understanding Cyclic Spell-Out. *NELS* 32:499–518.

Department of Linguistics
University of Michigan
1190 Undergraduate Science Building
204 Washtenaw Ave.
Ann Arbor, MI 48109
mobata@umich.edu