

On the Embedded and Matrix Locative Inversion*

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1. Introduction

The phenomenon known as Locative Inversion (hereafter, LI) has been widely discussed so far, and a great variety of analyses have been advanced. One proposes that the locative phrase in LI is substituted into the specifier of some functional projection, while the other claims that LI is the same adjunction operation as topicalization.

The organization of this paper is as follows. In section 2, I will examine the previous analyses of LI, and present evidence against them. Comparing LI with topicalization, I will consider symmetries and asymmetries in the following section, advancing a new analysis of LI. I will show, in section 4, how the analysis of LI suggested in section 3 can be applied to a matrix sentence. In the next section, I will discuss the status of the postverbal NP and the structure of LI.

2. Evidence Against the Previous Analyses of LI

Culicover (1991) suggests that in English, Pol(larity)P(hrase) can appear under some circumstances, as shown in (1a, b):¹

- (1) a. Lee wonders [_{CP} why [_{PolP} in no way would Robin volunteer]]
b. Lee wonders [_{CP} how [_{PolP} come at not many times would Robin eat dinner]]

The embedded clause in (1a, b) is selected by a bridge verb, and hence CP-PolP sequence is possible. That is why the negative constituent as well as the *wh*-constituent in (1a, b) can be preposed in an embedded *wh*-clause. Adopting this notion, Tanaka (1997) proposes that locative phrases in LI can also move into the specifier of PolP as the positive inversion in contrast with the negative one. This analysis has a great consequence in consideration of a sentence such as (2):^{2,3}

- (2) We suddenly saw how into the pond jumped thousands of frogs.

As in (1a, b), the locative phrase in (2) is preposed in an embedded *wh*-sentence. As a consequence, Tanaka (1997: 125) provides a configuration of LI, as shown in (3):⁴

(3) [_{PolP} Into the room_i [_{Pol'} null BE_j [_{IP} *t'*_k [_Γ walked_m *t*_j [_{VP} *t*_k *t*_m *t*_i]]] John_k]]

Although this analysis seems plausible at first sight, the PolP analysis will encounter theoretical and empirical difficulties.

First of all, let us consider Relativized Minimality.⁵ Below is an embedded clause, in which a *wh*-phrase and a locative phrase cooccur:

(4) ... [_{CP} Wh_i [_{PolP} Loc_i [_{Pol'} null BE_j [_{IP} *t'*_k [_Γ V_m *t*_j [_{VP} *t*_k *t*_m *t*_i]]]] Subject_k]]]]

It is plausible to assume that both [Spec, CP] and [Spec, PolP] are A'-specifiers. If so, it is difficult to explain why the *wh*-phrase in (4) can prepose over the locative phrase in [Spec, PolP], which can count as a potential governor, violating Relativized Minimality.

Second, the subject right-adjoined to IP in (4) might prevent the locative phrase from moving into [Spec, PolP] since, as pointed out by Kuwabara (1992), the adjoined position to IP can count as a potential governor.⁶ Even if the subject is adjoined to IP after the movement of the locative phrase, it is in violation of the strict cycle condition.

Thirdly, notice that PolP must be within CP selected by a bridge verb. Given this, the following sentences further cast doubt on the existence of PolP:

- (5) a. [_{CP} That [_{IP} Bill rushed into the Oval Office]] is believed *t*_{CP}.
 b. * [_{CP} That [_{PolP} into the Oval Office [_{IP} rushed Bill]]] is believed *t*_{CP}.
 c. e is believed [_{CP} that [_{IP} Bill rushed into the Oval Office]]
 d. e is believed [_{CP} that [_{PolP} into the Oval Office [_{IP} rushed Bill]]]

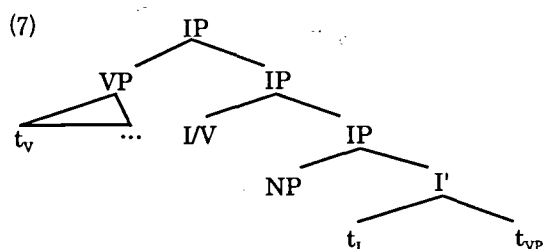
Suppose that (5a, b) are derived from (5c, d), respectively. Since *that*-clause in (5a, b) is selected by a bridge verb, i.e. *believed*, in its original position, and hence CP-PolP sequence is possible, (5b) is wrongly ruled in. In addition, consider the following examples:

(6) a. Mary said [_{CP} that [_{IP} Bill rushed into the Oval Office]]

b. * Mary said [_{CP} Φ [_{PolP} into the Oval Office [_{IP} rushed Bill]]]

As is well known, LI cannot occur in a clause without a complementizer. Notice, however, that in (6b), the embedded clause is selected by a bridge verb, and hence CP-PolP sequence is also possible. Consequently, (6b) is wrongly ruled in. From the reasons considered above, I do not adopt the PolP analysis in this paper.

On the other hand, Rochemont and Culicover (1990) claim that the locative phrase in LI is adjoined to IP in the same fashion as topicalization, as shown in (7):⁷



One important question concerning (7) will be: can structure (7) be applied to an embedded sentence? Recall that given the definition in Kuwabara (1992), an IP-adjoined position can count as a potential antecedent-governor. If so, sentence (2) repeated here as (8) is wrongly ruled out:

(8) We suddenly saw [_{CP} how_i [_{IP} [_{VP} t_k into the pond]]_j [_{IP} jumped_k [_{IP} thousands of frogs t_j t_i]]]]

Since an IP-adjoined position counts as a potential governor, the trace of *how* cannot be antecedent-governed. Hence, a violation of Relativized Minimality results. Furthermore, structure (8) also violates the Proper Binding Condition (PBC) requiring that traces must be bound (see Fiengo (1977) for the definition of the PBC). In (8), the trace of *jumped* is not bound, violating the PBC. Sentences such as (5b) further cast doubt on the IP adjunction analysis of LI in that if a locative phrase is preposed within a sentential subject, it is impossible to explain why (5b) repeated here as (9b) is deviant:

- (9) a. [_{CP} That [_{IP} Bill rushed into the Oval Office]] is believed *t*_{CP}
b. * [_{CP} That [_{IP} into the Oval Office [_{IP} rushed Bill]]] is believed *t*_{CP}

From the argument above, we can see that neither Rochemont and Culicover (1990) nor Tanaka (1997) can correctly account for the structure of LI.

3. Symmetries and Asymmetries Between LI and Topicalization

In this section, I will compare LI with topicalization. Consider examples below:⁸

- (10) a. * That into the Oval Office rushed Bill is believed.
b. * That this house he left to a friend was generous of him.
c. * Mary said into the Oval Office rushed Bill.
d. * Peter doesn't believe Mary, John likes.
e. We suddenly saw how into the pond jumped thousands of frogs.
f. * I wonder how the car John will fix.

Sentences (10a, b) show that a locative phrase and an NP cannot be preposed within a sentential subject. Examples (10c, d), in which constituents are preposed in a clause not introduced by *that*, are ungrammatical. Hence, these examples indicate similarities. Sentences (10e, f), on the other hand, show a dissimilarity. While a *wh*-phrase cannot move over a topicalized NP, it can move over a locative phrase. Why does this contrast between LI and topicalization appear?

Let us consider (10a, b) first. As argued in the previous section, the PolP analysis cannot account for the ungrammaticality of (10a). Since the sentential subject is selected by *believed*, that is, a bridge verb, in its original position, CP-PolP sequence is possible. As a consequence, (10a) is wrongly ruled in. Neither can Rochemont and Culicover (1992) explain (10a). Notice, however, that if we follow Hooper and Thompson (1979), (10a) as well as (10b) can be correctly excluded. See the following sentences:⁹

- (11) a. * That never in his life has he had to borrow money is true.
b. It's true that never in his life has he had to borrow money.
c. * That playing in tomorrow's concert will be Artur Rubinstein is certain.

- d. It's true that playing in tomorrow's concert will be Artur Rubinstein.
- e. * That into the Oval Office rushed Bill is true.
- f. It's true that into the Oval Office rushed Bill.

According to Hooper and Thompson, the complements in (11b, d) are cited or reported assertions, and hence preposing constituents is possible. However, as argued in Hooper and Thompson (1979: 476), "since placing the complement in subject position subordinates it, the sentential complement cannot be the main assertion if it occurs in subject position." Sentences such as (11a, c) are, therefore, excluded. It then follows that (11e) is excluded in the same fashion as (11a, c). Hence, a correct prediction.

Let us turn now to (10c, d). As shown above, the PolP analysis cannot explain the ungrammaticality of (10c). It should be noted that if LI is analyzed as topicalization, (10c) can be ruled out:

- (12) a. * Mary said [_{IP} into the Oval Office [_{IP} rushed Bill]]
- b. * Peter doesn't believe [_{IP} Mary, [_{IP} John likes]]

Adopting Bošković (1995), I assume that a clause without a complementizer is IP. If so, as pointed out by Bošković, sentences such as (12b) turn out to be ungrammatical because the topic is adjoined to the argumental IP. Following the same line, sentences such as (12a) are excluded since the locative phrase is adjoined to the argumental IP.

Finally, let us see why LI can occur in an embedded *wh*-clause. Recall that we have seen that LI and topicalization are both adjunction operations to IP. If this is on the right track, (10e) should be as ungrammatical as (10f). This is not the case, however. Then, what distinguishes LI from topicalization?

Let us consider here where the locative phrase in LI is positioned. I assume, following Bresnan (1994), that the locative phrase is a subject. This is borne out by Bresnan's observation:¹⁰

- (13) a. Over my windowsill seems__ to have crawled an entire army of ants.
- b. On that hill appears__ to be located a cathedral.
- c. It's in these villages that we all believe__ can be found the best examples of this

cuisine.

- d. *It's in these villages that we all believe that__ can be found the best examples of this cuisine.

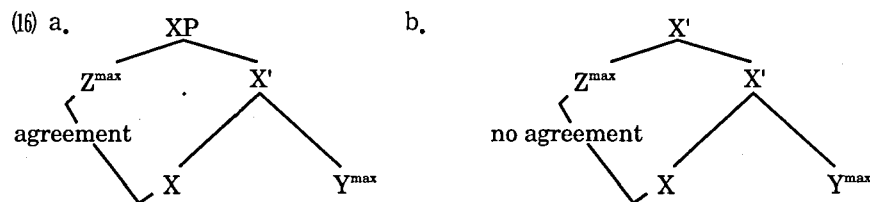
Examples (13a, b) indicate that a prepositional phrase can count as a subject of a raising predicate. In (13c, d), *that*-trace effect is observed. With this much as background, I suggest that the contrast between LI and topicalization lies in the respective positions of the proposed elements. It should be pointed out here that not only DPs but also APs, CPs and PPs can be in subject position:

- (14) a. [_{DP} John] loves Mary. (DP)
 b. [_{AP} More important] is that LI is an adjunction operation. (AP)
 c. [_{CP} That Bill rushed into the Oval Office] is believed. (CP)
 d. [_{PP} Into the Oval Office] rushed Bill. (PP)

Following the Extended Projection Principle (EPP, hereafter), which states that [Spec, IP] should be filled with some element, the constituents in (14a-d) check the EPP feature of I, respectively.¹¹ With this in mind, let us consider the contrast between (14a) and (14b-d). Notice that although the subject in (14a) checks the Φ -features of INFL, the subjects in (14b-d) do not, since it is doubtful to assume that English APs, CPs and PPs have Φ -features. If so, the subjects in (14b-d) check only an EPP feature. Consider (14a, d) as examples:

- (15) a. [_{DP} John] loves Mary
 EPP and Φ -features agreement
 b. [_{PP} Into the Oval Office] rushed Bill
 EPP feature agreement

Fukui (1986, 1995) proposes that in languages where SPEC-head agreement shows, a category projects to XP, whereas in languages where SPEC-head agreement does not show, a category projects to X' but not XP. Below are the loosely-sketched configurations of Fukui's "relativized X-bar theory":



In (16a), SPEC-head agreement is observed; hence, a maximal projection, that is, a closed category. In (16b), on the other hand, no SPEC-head agreement is observed. As a result, X does not project to XP. Extending (16), I suggest that a category projects to XP only by Φ -features agreement. Then, this leads us to the assumption that in (14b-d), I projects to I' rather than IP. With this much as background, let us turn to (10e, f) repeated here as (17a, b):

- (17) a. We suddenly saw [_{CP} how [_I into the pond [_I jumped thousands of frogs]]].
 b. * I wonder [_{CP} how [_{IP} the car [_{IP} John will fix]]].

Note that in (17b), the topic is adjoined to IP since the subject agrees with INFL by Φ -features. In (17a), on the other hand, the locative phrase is in [Spec, I]. If this is on the right track, the contrast between (17a,b) is accountable.

With regard to (17a), the *wh*-phrase can move over the locative phrase since [Spec, I] is an A-position. Hence, the trace of *how* can be antecedent-governed. In (17b), however, the IP adjoined position prevents *how* from antecedent-governing the trace, resulting in violation of Relativized Minimality. It follows, therefore, that the contrast between (17a) and (17b) is observed.

To conclude this section, we have seen that the locative phrase in LI is in [Spec, I]. This leads us to conclude that LI can occur in an embedded *wh*-clause, while topicalization cannot.¹² Although the analysis thus far can be applicable to an embedded sentence, we will encounter a difficulty in the analysis of a matrix *wh*-sentence. In the following section, I will discuss how the analysis advanced in this section can account for LI in a matrix *wh*-sentence.

4. LI in a Matrix Sentence

In the previous section, I have suggested that the locative phrase in LI is in [Spec, I].

This analysis can explain the fact that in an embedded *wh*-clause, the *wh*-phrase can be preposed over the locative phrase. Notice, however, that this analysis cannot be employed for a matrix *wh*-sentence:¹³

- (18) a. * [_{CP} How_i [_{IP} into the room [_{IP} walked John t_i]]]?
 b. * [_{CP} How_i [_C did_j] [_{IP} into the room [_{IP} t_j walk John t_i]]]?
 c. * [_{CP} How_i [_C walked_j] [_{IP} into the room [_{IP} t_j John t_i]]]?

Since [Spec, I] is an A-position, the trace of *How* in (18a-c) can be antecedent-governed. As a result, (18a-c) are wrongly ruled in. Then, how should the matrix LI be treated?

First of all, let us compare (18a) with (10e), which are assigned structures as shown in (19):

- (19) a. * [_{CP} How_i [_C e] [_{IP} into the room [_{IP} walked John t_i]]]?
 b. We suddenly saw [_{CP} how_i [_C e] [_{IP} into the pond [_{IP} jumped thousands of frogs t_i]]].

It is important to note that if sentences such as (19a) are embedded as in (19b), they turn out to be grammatical. Following Chomsky (1995) here, since C in a matrix *wh*-sentence has a strong V-feature attracting I, whereas C in an embedded one does not, I in (19b) need not raise to C at overt syntax.¹⁴ In (19a), on the other hand, the strong V-feature in C need be checked; otherwise, the derivation crashes. Hence the deviance of (19a).¹⁵

Next, let us proceed to (18b). It is well known that LI occurs under highly restricted circumstances:¹⁶

- (20) a. Into the room walks John.
 b. Into the room walked John.
 c. * Down the hill may roll the baby carriage.
 d. * Down the stairs has fallen the baby.
 e. * Into the room may have been walking John.
 f. * Into the room did walk John.

As shown in (20c-f), if I is filled with some lexical element, LI does not occur. Bearing (20) in

mind, consider the following examples:

- (21) a. * [_{CP} How_i [_C did_j] [_I into the room [_I t_j walk John t_i]]]?
 b. * [_{CP} How_i [_C e] [_I into the room [_I [_I did] walk John t_i]]]?

Suppose that (21a) is derived from (21b). Sentence (21a) is, therefore, ruled out if (21b) is excluded.

Lightfoot (1993) provides a significant analysis of the emergence of a periphrastic *do*. Historically speaking, as pointed out by Lightfoot, the occurrence of a periphrastic *do* is related to verb raising to I. Lightfoot (1993: 207) states that “[e]ach insertion of a periphrastic *do* to carry inflectional markers represents a case where V-to-I operation has not applied, so a steady increase in the distribution of *do* entails fewer and fewer instances of V-to-I.” It is significant to note that up to a certain stage of time, a verb raises to I from inside VP in English. This is borne out by the following examples:¹⁷

- (22) a. I wende *wel* thys nyght to have deyed. Caxton, *The Ryall Book* lines 20-25.
 ‘I managed almost tonight to die.’
 b. ...that is to seyn, while that they liven *bothe*. Chaucer, *The Parson’s Tale* line 916.
 ‘...while they both live.’

In (22a, b), the verbs precede the adverb, *wel* (almost), and the quantifier, *bothe* (both), respectively, showing V-to-I movement. Suppose that in LI, the inflection of I is somewhat impoverished and a periphrastic *do* cannot be inserted. Then, the verb in LI must overtly move to I in order to accomplish the inflection of I. Hence, I in LI is defective in a sense. If this is on the right track, we are now in a position to account for why (21a, b) are ungrammatical. Since I in (21b) is filled with a periphrastic *do*, the verb cannot move to I, resulting in the failure of the inflection of I.¹⁸ These results lead to the conclusion that (21a) is ungrammatical.

The above argument has much bearing on the discussion to follow. Consider (18c) repeated here as (23):

- (23) * [_{CP} How_i [_C walked_j] [_I into the room [_I t_j John t_i]]]?

Supposing that the verb in LI raises to I, as argued above, C in a matrix *wh*-clause can attract the verb since the matrix C has a strong V-feature. This movement is, however, illegitimate, as shown in (23). Then, what prevents the verb from raising to C? Following Lightfoot, I assume that poor verbal inflection blocks additional verb movement to C from I. This is supported by the examples below:¹⁹

- (24) a. * Likes he Mary?
 b. * Walks into the room John?
 c. Aime-t-il Marie?

In French, V-to-C via I is operative, as shown in (24c), since French verbal inflection is rich. In English, on the other hand, the verbal inflection not being rich, V-to-C movement is not operative, as shown in (24a-b). From this viewpoint, it is clear that sentences such as (23) are ruled out because the verb is in C. Thus, the present analysis of LI can account for the facts in (18a-c) without changing the analysis of LI in an embedded sentence.

5. The Status of a Postverbal NP and the Structure of LI

In the argument so far, I have not discussed the position of the postverbal NP in LI. Before considering where the postverbal NP is positioned, let us make a brief examination on the thematic structure concerning LI. Following Bresnan (1994), and assuming that verbs in LI are unaccusative, as argued in Levine and Rappaport (1995) and Ura (1996), I assume that the postverbal NP is the theme one. In addition, partially adopting the clause structure suggested by Chomsky (1995), let us proceed to consider the configuration of LI assigned a structure as follows:^{20, 21}

- (25) [_I [_I e] [_V locative PP [_V V theme]]]

Note that there does not exist an external argument in LI since verbs in LI are unaccusative. With (25) in mind, consider the following examples:²²

- (26) a. * Down the street walked the old nanny her dog.
 b. * Into the room rolled John the ball.

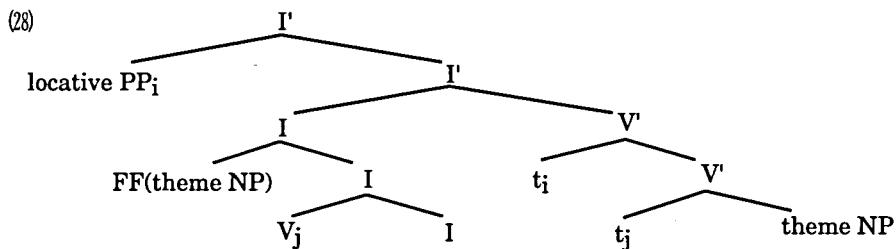
Examples (26a, b) show that the transitivity restriction appears in LI. Given the assumption that verbs in LI are unaccusative, (26a, b) turn out to be ungrammatical, since an external argument cannot appear in LI. To put it differently, *the old nanny* and *John* in (26a, b) cannot have a θ -role, resulting in violation of Full Interpretation.²³ Hence, (26a, b) are deviant.

The current analysis of LI, however, cannot explicate sentences such as (27):

(27) * $[_{IP} \text{John}_i [_R \text{into the room}_j [_R [_I \text{walked}_k] [_V t_j t_k t_i]]]]]$

Suppose that theme NP *John* overtly moves into the outer specifier of I in order to check Case and Φ -features. Hence IP, a maximal projection. Notice that the EPP feature in I need not be checked since the locative phrase checks it. As a consequence, sentences such as (27) are overgenerated. Then, what excludes sentences such as (27)? Recall that *into the room* is a subject. If so, *John* in (27) need not overtly move to the outer specifier of IP, given that the Case feature of *John* is checked at LF. It then follows that (27) is in violation of Procrastinate, which states that covert movement is more economical than overt movement.

Finally from what has been said above, we can now provide the structure of LI as shown in (28):



The locative phrase moves to [Spec, I], checking the EPP feature in I, and the theme NP covertly adjoins to I in order to check the Case feature. In addition, the verb in LI raises to I.

6. Conclusion

To sum up, what I have tried to show in this paper is that the locative phrase in LI is in

[Spec, I]. The position, therefore, counts as an A-position in contrast to topicalization, in which, though an adjunction operation, the preposed phrase is adjoined to IP. The suggested analysis allows us to account for the different behavior between LI and topicalization within an embedded *wh*-sentence, demonstrating that the analysis can be utilized for the matrix LI in a similar fashion. The foregoing discussion indicates that the suggested analysis can uniformly apply to the embedded and matrix LI.

Notes

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1. Sentences (1a, b) are cited from Culicover (1991: 12).
2. Example (2) is from Hoekstra and Mulder (1990: 32).
3. Although most of my informants accept sentences such as (1) and (2), those who do not accept (1) tend to regard (2) as ungrammatical.
4. With regard to the structure of (3), “null BE” is a bound morpheme, which induces the verb movement to I. In the end, the morpheme raises to the head of PolP in order to agree with the locative phrase in [Spec, PolP]. As for the postverbal NP in LI, Tanaka suggests that it is adjoined to the right of IP because of focus movement.
5. The definition of Relativized Minimality and its relevant notions follow:
 - (i) Relativized Minimality: X α -governs Y only if there is no Z such that
 - (a) Z is a typical potential α -governor for Y,
 - (b) Z c-commands Y and does not c-command X. Rizzi (1990: 7)
 - (ii) a. Z is a typical potential head governor for Y = Z is a head m-commanding Y.
 - b. Z is a typical potential antecedent governor for Y, Y in an A'-chain = Z is a typical potential antecedent governor for Y, Y in an A-chain = Z is an A specifier c-commanding Y.
 - c. Z is a typical potential antecedent governor for Y, Y in an A'-chain = Z is an A'-specifier-commanding Y.

d. Z is a typical potential antecedent governor for Y, Y in an X⁰-chain = Z is a head c-commanding Y. Rizzi (1990: 26)

6. Kuwabara (1992) modifies the status of a potential antecedent governor in an A'-chain as follows:

(i) A potential antecedent governor in an A'-chain: In a configuration [...X...Z...Y...], Z is a typical potential antecedent governor for Y, Y in an A'-chain = Z is an A'-specifier or in an A'-adjoined position c-commanding Y.

7. Structure (7) is adapted from Rochemont and Culicover (1990: 90). Rochemont and Culicover propose that VP including a locative PP is preposed and adjoins to IP.

8. Example (10b) is adapted from Emonds (1976: 31). Sentence (10d) is from Bošković (1995: 52).

9. Examples (11a-d) are from Hooper and Thompson (1979: 476).

10. Sentences (13a-d) are cited from Bresnan (1994: 96-97).

11. It is arguable whether APs, CPs and PPs have an EPP feature. I leave this matter open in this paper. See Noji (1997) for an alternative analysis.

12. One might point out that the ungrammaticality of (10c) repeated here as (i) cannot be accounted for, given that the locative phrase is in [Spec, I]:

(i) *Mary said [_I into the room [_I rushed Bill]]

Recall that I argued, following Bošković (1995), that the locative phrase is adjoined to the argumental IP. Hence, sentences such as (i) are deviant. However, assuming now that the locative PP is in [Spec, I], LI might be considered a substitution operation rather than an adjunction operation. I leave this matter open here.

13. It should be pointed out that if the locative phrase in LI is adjoined to IP, sentences (18a-c) are excluded by Relativized Minimality:

(i) a. * [_{CP} How_i [_{IP} into the room [_{IP} walked John t_i]]]?

b. * [_{CP} How_i [_C did_j] [_{IP} into the room [_{IP} [_I t_j] walk John t_i]]]?

c. * [_{CP} How_i [_C walked_j] [_{IP} into the room [_{IP} t_j John t_i]]]?

As argued above, the IP-adjoined position can become a potential governor in an A'-chain. Hence, the trace of *how* cannot be antecedent-governed.

14. Chomsky (1995: 297) defines *Attract F[eature]* as follows:

(i) K *attracts* F if F is the closest feature that can enter into a checking relation with a sublabel K.

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