

## CHAPTER 6

### RECONSTRUCTION

#### 6.0 Introduction

The preceding chapters have considered the locality restrictions on movement as empirical evidence in support of our theory of the composition of phrase structure. It was shown that the locality restrictions on movement straightforwardly follow if the composition of phrase structure conforms to the ICP and the EP during derivations. This chapter investigates reconstruction effects with Condition C of the binding theory, variable binding, and the interpretation of *each other*, arguing that they also follow from our theory of phrase structure. If the arguments to follow are on the right track, our theory of phrase structure receives strong empirical support from the fact that its effects are observed in two totally different kinds of relations, i.e., movement and binding relations.

The organization of this chapter is as follows. Section 6.1 discusses reconstruction effects with Condition C of the binding theory. It is shown that there is an argument/adjunct asymmetry concerning reconstruction effects with Condition C of the binding theory. When R-expressions are contained within "fronted" complements, reconstruction effects emerge. When R-expressions are contained within "fronted" adjuncts, anti-reconstruction effects emerge. I will argue that this asymmetry follows from our theory of phrase structure together with the assumption that Condition C applies at LF. Section 6.2 considers reconstruction effects with variable binding. It is shown that

reconstruction effects with variable binding occur when pronouns are contained within "fronted" complements but not when they are contained within "fronted" adjuncts. I will argue that this argument/adjunct asymmetry with variable binding also follows from our theory of phrase structure coupled with the assumption that variable binding relations are established at LF. Section 6.3 discusses reconstruction effects with *each other*. It is shown that reconstruction effects with *each other* emerge when *each other* is contained within a "fronted" complement but not when it is contained within a "fronted" adjunct. I will argue that given that a constraint on the interpretation of *each other* applies at LF, this argument/adjunct asymmetry with *each other* follows from our theory of phrase structure. Section 6.4 makes concluding remarks.

### 6.1 (Anti-)Reconstruction Effects with Condition C

This section investigates reconstruction effects with Condition C of the binding theory. As observed by Lebeaux (1988, 1991) and van Riemsdijk and Williams (1981), there is an argument/adjunct asymmetry concerning reconstruction effects with Condition C of the binding theory. When R-expressions are contained within "fronted" complements, reconstruction effects with Condition C emerge. When R-expressions are contained within "fronted" adjuncts, on the other hand, the reconstruction effects are abrogated. I will argue that this asymmetry concerning the reconstruction effects straightforwardly follows from our theory of phrase structure together with the assumption that Condition C of the binding theory applies at LF.

Before turning to the reconstruction effects, let us consider the status of the binding theory under the MP. It has been assumed in the EST framework (see, among others, Chomsky (1981)) that binding conditions apply at S-structure. Under the MP where S-structure as well as D-structure is eliminated, binding conditions should be reformulated either as interface conditions or as constraints which apply throughout derivations. Following Chomsky (1993) and Chomsky and Lasnik (1993), let us assume that binding conditions are reformulated as interface conditions which hold at LF.<sup>1</sup> Condition C of the binding theory can be formulated as an LF-interface condition, as shown below:<sup>2</sup>

- (1) If  $\alpha$  is an R-expression, interpret it as disjoint from every c-commanding phrase.

(Chomsky 1993:43)

### 6.1.1 An Argument/Adjunct Asymmetry with Condition C

Returning to the reconstruction effects with Condition C of the binding theory, let us first look at the following examples:

- (2) a. \***he<sub>i</sub>** likes those pictures of **John<sub>i</sub>**  
 b. \*Mary says that **he<sub>i</sub>** feared the examination of **John<sub>i</sub>**
- (3) a. \***he<sub>i</sub>** likes those pictures near **John<sub>i</sub>**

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<sup>1</sup>As discussed in chapter 2, Chomsky (1993) suggests that the binding theory might be outside of the computational system. Under this view, LF-representations only provide instructions for the conceptual-intensional system where linguistic expressions get interpretations. Since the choice between these two views, i.e., whether the binding theory stays inside or outside of the computational system, does not affect the arguments to follow, I assume for expository purposes that binding conditions hold at LF.

<sup>2</sup>For detailed discussion of Condition C of the binding theory, see, among others, Chomsky (1981, 1986b), Huang (1991), Lasnik (1989), and Lasnik and Uriagereka (1988). See Chomsky (1982) and Reinhart (1983) for arguments in favor of the elimination of Condition C. Lasnik (1989) presents extensive arguments against the elimination of Condition C.

- b. \*Mary says that **he<sub>i</sub>** peeked at the examination paper near **John<sub>i</sub>**

The examples in (2-3) are all deviant due to violations of Condition C of the binding theory (1), because *John*, being an R-expression, is c-commanded by the coreferent *he*. As observed by Lebeaux (1988, 1991) and van Riemsdijk and Williams (1981), however, the divergence occurs in (4-5):

- (4) a. ?\*[which pictures [of **John<sub>i</sub>**]] do you think that **he<sub>i</sub>** likes *t* best  
 b. \*[which examination [of **John<sub>i</sub>**]] did Mary say that **he<sub>i</sub>** feared *t*
- (5) a. [which pictures [near **John<sub>i</sub>**]] do you think that **he<sub>i</sub>** likes *t* best  
 b. [which examination paper [near **John<sub>i</sub>**]] did Mary say that **he<sub>i</sub>** peeked at *t*

While *John* and *he* can be coreferential in (5a-b), they cannot be coreferential in (4a-b). The difference between (4) and (5) resides in the fact that while *John* is the complement of the noun in the former, it is within the adjunct modifying the noun in the latter. In other words, the anti-reconstruction effects are observed in (5) while the reconstruction effects are observed in (4). I will argue that this argument/adjunct asymmetry with respect to the reconstruction effects straightforwardly follows from our theory of phrase structure together with the assumption that Condition C of the binding theory applies at LF.

Let us first consider the case where R-expressions are contained within "fronted" complements, taking (4a) as an example. We first select

*of*. The ICP requires that its selectional restriction feature, being uninterpretable, should be checked immediately by selecting *John* and combining *of* with *John*. The next step is to select *pictures*. Its selectional restriction feature, being uninterpretable, must be checked immediately by combining *pictures* with its complement of *John*, conforming to the ICP. We then select the D *which*. The ICP requires that its selectional restriction feature should be checked immediately by combining *which* with *pictures of John*. In this way, we construct the  $D^{\max}$  *which pictures of John* (6). For expository purposes, we only pay attention to Q-features here and in the relevant structures to follow:

$$(6) \quad [D^{\max} \text{ which}_{[Q]} [N^{\max} \text{ pictures } [P^{\max} \text{ of John}]]]$$

As the derivation proceeds, we come to the stage where the strong Q-feature of the matrix C is to be checked:

$$(7) \quad \begin{array}{l} \text{a.} \quad [C^{\max} C_{[Q]} [T^{\max} T [V^{\max} \text{ you } [\text{think } [C^{\max} \text{ that } [T^{\max} T \\ [V^{\max} \text{ he } [\text{likes } [D^{\max} \text{ which}_{[Q]} \text{ pictures of John}]]]]]]]]]] \\ \text{b.} \quad \text{he} \\ \text{c.} \quad \text{you} \end{array}$$

As required by the ICP, the strong Q-feature of C is checked immediately by copying *which pictures of John*, which is the minimal maximal projection containing the Q-feature required for convergence:

$$(8) \quad \begin{array}{l} \text{a.} \quad [C^{\max} C_{[Q]} [T^{\max} T [V^{\max} \text{ you } [\text{think } [C^{\max} \text{ that } [T^{\max} T \\ [V^{\max} \text{ he } [\text{likes } [D^{\max} \text{ which}_{[Q]} \text{ pictures of } \\ \text{John}]]]]]]]]]] \\ \text{b.} \quad \text{he} \\ \text{c.} \quad \text{you} \\ \text{d.} \quad [D^{\max} \text{ which}_{[Q]} \text{ pictures of John}] \end{array}$$



Chomsky (1993) proposes the preference principle for reconstruction, which states that the restriction in the operator position must be minimized unless it would make a derivation crash. The preference principle compares (11a-b) and requires that only the D *which*, but not the whole  $D^{\max}$  *which pictures of John*, should remain in the operator position. Since both (11a) and (11b) converge, (11a) rather than (11b) is chosen as the LF representation. In (11a), since *John* is c-commanded by *he*, Condition C of the binding theory (1) requires that the former should be disjoint in reference from the latter. Hence, the deviancy of (4a), where *John* and *he* are coreferential, follows.

Let us next consider the case where R-expressions are contained within "fronted" adjuncts, taking (5a) as an example. Unlike in (4a), *John* and *he* may be coreferential in (5a). Let us consider how we construct (5a). We first select the D *which*. The ICP requires that the selectional restriction feature of D, being uninterpretable, should be checked immediately by selecting the noun *pictures* and combining *which* with *pictures*, as shown below:

$$(12) \quad [D^{\max} \text{ which}_{[Q]} [N^{\max} \text{ pictures}]]$$

According to the EP, the next step must be to select the verb *like*. When the verb *like* is selected, the ICP requires that its selectional restriction feature should be checked immediately by combining the verb *like* with the  $D^{\max}$  *which picture*. The resulting structure is as follows:

$$(13) \quad [V^{\max} \text{ likes} [D^{\max} \text{ which}_{[Q]} [N^{\max} \text{ pictures}]]]$$

It should be noted that the adjunct  $P^{\max}$  *near John*, whose insertion is not triggered by any UFF, has not been merged with the  $D^{\max}$  *which pictures* at this point of the derivation. In other words, the main structure (13)

and the adjunct  $P^{\max}$  *near John* each constitute an independent syntactic object at this point.

As the derivation proceeds, we come to the stage where the strong Q-feature of the matrix C is to be checked, as shown below:

- (14) a.  $[C^{\max} C_{[Q]} [T^{\max} T [V^{\max} \text{you} [\text{think} [C^{\max} \text{that} [T^{\max} T [V^{\max} \text{he} [\text{likes} [D^{\max} \text{which}_{[Q]} \text{pictures}]]]]]]]]]]]$   
 b. he  
 c. you  
 d.  $[P^{\max} \text{near John}]$

The strong Q-feature of C is checked immediately by copying *which pictures* in accordance with the ICP, as shown below:

- (15) a.  $[C^{\max} C_{[Q]} [T^{\max} T [V^{\max} \text{you} [\text{think} [C^{\max} \text{that} [T^{\max} T [V^{\max} \text{he} [\text{likes} [D^{\max} \text{which}_{[Q]} \text{pictures}]]]]]]]]]]]$   
 b. he  
 c. you  
 d.  $[P^{\max} \text{near John}]$   
 e.  $[D^{\max} \text{which}_{[Q]} \text{pictures}]$

These syntactic objects are merged together, resulting in the following structure. Here, we ignore all formal features including Q-features:

- (16)  $[[[\text{which pictures}]_j \text{near John}] [C [\text{you}_k [T [\text{you}_k [\text{think} [\text{that} [\text{he}_l [T [\text{he}_l [\text{likes} [\text{which pictures}]_j]]]]]]]]]]]]]$

Note that the adjunct *near John* is merged with the  $D^{\max}$  *which pictures* in the Spec of  $C^{\max}$  but not the one in its original position.

Among the chains created in this derivation, the following chain is relevant to the discussion:

- (17) CH = (*which pictures*, *which pictures*)

Recall that the terms that are identical in constitution but positionally distinct from each other form a chain in the LF-component. In the present derivation, *which pictures* is introduced a second time in the syntactic object through Copy. The two occurrences of *which pictures* are therefore identical in constitution but positionally distinct from each other, forming the chain (17) in the LF-component. It is important to note that the adjunct *near John*, which is merged with *which pictures* after the latter undergoes Copy, is not part of the chain. After application of the LF-operation for construction of an operator-variable structure, we get the following two LF-representations:

- (18) a.    **[[which x] near John] [you think that he likes [x pictures]]**  
           b.    **[[which x, x pictures] near John] [he likes x]**

Between these LF-representations, the preference principle chooses (18a), excluding (18b). In (18a), *John* is not c-commanded by *he*. There is no violation of Condition C of the binding theory (1) even if *John* is in the coreference relation with *he*. We can correctly predict that (5a) is acceptable.

To summarize this subsection, our theory of phrase structure requires that the complements of nouns should be merged with main structures cyclically and thus reconstructed to their original positions. It then follows that examples like (4a), where R-expressions are contained within "fronted" complements, show the reconstruction effects with respect to Condition C of the binding theory. The adjuncts modifying nouns, on the other hand, should be merged with main structures postcyclically. There is no way to reconstruct the adjuncts, since they

undergo direct insertion to their surface positions and thus do not have any "original" positions. We can therefore correctly predict that examples like (5a), where R-expressions are contained within "fronted" adjuncts, exhibit the anti-reconstruction effects with respect to Condition C of the binding theory.

### 6.1.2 Complex NPs and the Anti-Reconstruction Effects

As discussed in the previous subsection, the anti-reconstruction effects with Condition C of the binding theory are only observed when R-expressions are contained within "fronted" adjuncts. Recall that adjuncts are those which are forced to be merged with main structures postcyclically. If this analysis is on the right track, we should expect that complex NPs, whose appositive or relative clauses are required to be merged with main structures postcyclically, also exhibit the anti-reconstruction effects. This prediction is borne out, as shown below:<sup>3</sup>

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<sup>3</sup>Lebeaux (1988, 1991) presents the following examples, claiming that the contrast in acceptability between (i) and (ii) suggests that the non-relative clause cases of the complex NPs should be interpreted as noun-complement structures rather than noun-appositive structures and thus merged with the main structures cyclically:

- (i) [which claim that John<sub>i</sub> made]<sub>j</sub> did he<sub>i</sub> later deny *t<sub>j</sub>*
- (ii) \*[whose claim that John<sub>i</sub> likes Mary]<sub>j</sub> did he<sub>i</sub> deny *t<sub>j</sub>*

Under his analysis, the clause following *claim* in (ii) would be inserted cyclically before application of wh-movement. The LF-representation of (ii) would be as follows:

- (iii) [which *x*, *x* a person] [he denied [*x*'s claim that John likes Mary]]

In (iii), the R-expression *John* is c-commanded by *he*. Lebeaux's analysis would correctly predict that the former cannot be coreferential with the latter.

As Lebeaux himself points out in the footnote, however, the contrast between (i) and (ii) disappears if we replace *whose* by *which* in (ii). He admits that the deviancy of (ii) may not be due to the fact that the noun *claim* and its following clause constitutes a noun-complement structure but due to the existence of the genitive *wh*-phrase *whose*. It should also be pointed out that there are some speakers who cannot see any contrast between (i) and (ii).

Another possible reason for the deviancy of examples like (ii) for some speakers is that there is no difference in phonetic shape between the noun *claim* and the verb *claim*. The noun *claim* and the verb *claim* are derived one from the other by conversion or zero-derivation. It is reasonable to claim that because of their having the same phonetic

- (19) a. [which piece of evidence [that **John<sub>i</sub>** discovered]] was **he<sub>i</sub>** willing to discuss *t*  
 b. [which piece of evidence [that **John<sub>i</sub>** was asleep]] was **he<sub>i</sub>** willing to discuss *t*  
 (Watanabe 1995:290)
- (20) a. [which evidence [that **John<sub>i</sub>** presented to court in order to deceive the attorney]] did **he<sub>i</sub>** later ignore *t*  
 b. [which evidence [that **John<sub>i</sub>** quarreled with his wife at a boathouse]] did **he<sub>i</sub>** later ignore *t* in court
- (21) a. [which explanation [that **John<sub>i</sub>** offered based on his careful observations]] did **he<sub>i</sub>** later deny *t*  
 b. [whose explanation [that **John<sub>i</sub>** was temporarily mad at his wife]] did **he<sub>i</sub>** deny *t* in court
- (22) a. [which belief [that **John<sub>i</sub>** discovered]] was **he<sub>i</sub>** willing to discuss *t*  
 b. [whose belief [that **John<sub>i</sub>** was asleep]] was **he<sub>i</sub>** willing to discuss *t*

In the (a) examples of (19-22), the R-expression *John* is contained within the "fronted" relative clause. In the (b) examples of (19-22), on the other hand, the R-expression *John* is contained within the "fronted" appositive clause of the noun. In all of these examples, *John* can be coreferential with *he*. In other words, the anti-reconstruction effects are observed.

Let us consider (19a-b) as examples. Recall that the relative clause *that John discovered* in (19a) and the appositive clause *that John*

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form, some speakers interpret the noun *claim* and its following clause as a noun-complement structure by analogy with the verb *claim* and its complement.

*was asleep* in (19b) are both adjuncts and thus merged with the *wh*-phrases after the latter undergoes Copy. Hence, the LF-representations of (19a-b), which are derived by the operation for construction of an operator-variable structure and chosen by the preference principle, are as follows:

- (23) a. [[**which x**] that John discovered] [was he willing to discuss [**x piece of evidence**]]  
 b. [[**which x**] that John was asleep] [was he willing [to discuss [**x piece of evidence**]]]

In (23a-b), *John* is not c-commanded by *he*; there is no violation of Condition C of the binding theory even if *John* is in the coreferential relation with *he*. Hence, (19a-b) are acceptable under the coreferential readings between *John* and *he*. The examples in (20-22) can be accounted for in a similar fashion.

To summarize this section, our theory of phrase structure together with the assumption that Condition C of the binding theory applies at LF gives us a minimalist account of the argument/adjunct asymmetry with the (anti-)reconstruction effects with Condition C of the binding theory.

## 6.2 Reconstruction Effects with Variable Binding

This section considers reconstruction effects with variable binding. It is pointed out that reconstruction effects with variable binding are observed if pronouns are contained within "fronted" complements. If pronouns are contained within "fronted" adjuncts, on the other hand, no reconstruction effects with variable binding are observed. I will argue that such an argument/adjunct asymmetry concerning reconstruction

effects with variable binding straightforwardly follows from our theory of phrase structure coupled with the assumption that variable binding relations are established at LF.

### 6.2.1 An Argument/Adjunct Asymmetry with Variable Binding

Pronouns may take not only referential phrases but also quantificational phrases as their antecedent. In the latter situation, pronouns are used as bound variables, the referential values of which vary with the value-assignment of their quantificational antecedents, as shown below:

(24) **everyone<sub>i</sub>** loves **his<sub>i</sub>** mother

In (24), the pronoun *he* may be interpreted as a variable bound by the quantificational phrase *everyone*, as represented in (25):<sup>4</sup>

(25) for every  $x$ ,  $x$  a person,  $x$  loves  $x$ 's mother

Among conditions that regulate bound pronouns, (26) is relevant to the following discussion:

(26) Pronouns can be interpreted as bound variables only if they are c-commanded by quantificational phrases at LF.

This condition is one of the necessary conditions for pronouns to be used as bound variables. In order to see why we need this condition, let us first consider the following examples:

(27) a. [D<sup>max</sup> a report [P<sup>max</sup> about [D<sup>max</sup> **every student**]]]  
was sent out

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<sup>4</sup>See, among others, Chomsky (1981), Koopman and Sportiche (1982/1983), Higginbotham (1980), May (1977, 1985), and Montalbetti (1984) for detailed discussion of bound pronouns.

- b.  $[D^{\max}$  this report  $[P^{\max}$  about  $[D^{\max}$  **every student**]]]  
was sent out

(27a) is ambiguous between what May (1977, 1985) calls an inversely-linked and internal scope readings. In the former reading, the quantificational phrase *every student* has scope over the entire sentence, as paraphrased in (28a). In the latter reading, the quantificational phrase *every student* only has scope over the  $D^{\max}$  containing it, as paraphrased in (28b):

- (28) a. for every student there is a report about him which  
was sent out  
b. a report which contains information about every  
student was sent out

(27b), on the other hand, only has an internal scope reading due to the specificity condition effect caused by the determiner *this*, meaning that this report which contains information about every student was sent out. In other words, the quantificational phrase *every student* may not take scope over the entire sentence in (27b).

With the above discussion in mind, let us consider the following examples:

- (29) a.  $[D^{\max}$  a report card  $[P^{\max}$  about  $[D^{\max}$  **every student**]<sub>i</sub> ] ] was sent to **his**<sub>i</sub> parents  
b.  $*[D^{\max}$  this report card  $[P^{\max}$  about  $[D^{\max}$  **every student**]<sub>i</sub> ] ] was sent to **his**<sub>i</sub> parents

In (29a), the pronoun *his* may be interpreted as a variable bound by the quantificational phrase *every student*. In (29b), on the other hand, the pronoun *his* may not be interpreted as a variable bound by the

quantificational phrase *every student*. This contrast in the availability of bound variable readings follows from (26). As shown above, the quantificational phrase *every student* may have scope over the entire sentence in (29a) whereas it may not have scope over the entire sentence due to the Specificity Condition in (29b). Given that scope relations are established by c-command relations at LF, the quantificational phrase *every student*, which has scope over the entire sentence, c-commands the pronoun *his* at LF in (29a). Hence, the pronoun *his* may be interpreted as a variable bound by the quantificational phrase *every student*. In (29b), on the other hand, the pronoun *his* is not c-commanded by the quantificational phrase *every student* at LF. This is because *every student* only has scope over the  $D^{\max}$  but not over the entire sentence due to the Specificity Condition. The pronoun *his* therefore may not be interpreted as a bound variable.

There is, however, a set of examples which apparently does not conform to (26):

- (30) a. [which pictures [of **his<sub>i</sub>** parents]] do you think that **every man<sub>i</sub>** likes *t*
- b. [which attack [on **his<sub>i</sub>** country]] do you think that **every American<sub>i</sub>** still remembers *t*
- c. [which story [about **him<sub>i</sub>**]] do you think that **every man<sub>i</sub>** most often hears *t* from his parents

This type of construction is extensively discussed by Engdahl (1980, 1986). In (30), although the pronouns are moved out of the scope domain of the quantificational phrases, the pronouns can be properly interpreted as bound variables. The phrases which contain the pronouns are

interpreted as if they were in their trace sites. In other words, the reconstruction effects with variable binding are observed.

Such reconstruction effects with variable binding, however, are not always available, as shown below:<sup>5</sup>

- (31) a. \*?[which criticism [because of **his<sub>i</sub>** scandal]] do you think that **every congressman<sub>i</sub>** remembers *t*
- b. \*?[which book [around **him<sub>i</sub>**]] do you think that **every man<sub>i</sub>** most often read *t*
- c. ?[which bus stop [near **his<sub>i</sub>** house]] do you think that **every resident<sub>i</sub>** most often uses *t*
- d. \*?[[which food [after **his<sub>i</sub>** fight]] do you think that **every boxer<sub>i</sub>** loves to eat *t*

In (31), the bound variable readings of *he/his* are not available. The difference between the examples in (30) and those in (31) resides in the fact that while the pronouns are contained within the complements in the former, they are contained within the adjuncts in the latter. There exists an argument/adjunct asymmetry concerning the reconstruction effects with variable binding. I will argue that this argument/adjunct asymmetry follows from our theory of phrase structure coupled with the assumption that variable binding relations are established at LF.

Let us first consider the reconstruction effects observed in (30), taking (30a) as an example. In order to construct *which pictures of his*

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<sup>5</sup>Lebeaux (1991) claims that examples like (31) are not deviant. Based on such observations, he argues that while complements are always inserted cyclically, adjuncts are inserted either cyclically or postcyclically. Contrary to Lebeaux's observations, there is a clear contrast in acceptability between examples like (30) and those in (31), though the degree of deviance of the latter varies among speakers. I therefore claim that the argument/adjunct asymmetry concerning the reconstruction effects with variable binding really exists.

*parents*, we first select the D *his*. When the D *his* is selected, the ICP requires that its selectional restriction feature, being uninterpretable, should be checked immediately by selecting the noun *parents* and combining *his* with *parents*. Next, the preposition *of* is selected and its selectional restriction feature is checked immediately by combining *of* with *his parents* in accordance with the ICP. Then, the noun *pictures* is selected and its selectional restriction feature is checked by combining *pictures* with *of his parents*. Finally, the determiner *which* is selected and its selectional restriction feature is checked by merger of *which* with *pictures of his parents*. The resultant structure is as below:

$$(32) \quad [D^{\max} \text{ which}_{[Q]} [N^{\max} \text{ pictures } [P^{\max} \text{ of } [D^{\max} \text{ his } [N^{\max} \text{ parents}]]]]]]$$

As the derivation proceeds through checking the UFFs of the selected items, we come to the stage where the strong Q-feature of the matrix C is to be checked:

$$(33) \quad \begin{array}{l} \text{a.} \quad [C^{\max} C_{[Q]} [T^{\max} T [V^{\max} \text{ you } [\text{think } [C^{\max} \text{ that } [T^{\max} T [V^{\max} \text{ every man } [\text{likes } [D^{\max} \text{ which}_{[Q]} \text{ pictures of his } \\ \text{parents}]]]]]]]]]] \\ \text{b.} \quad \text{every man} \\ \text{c.} \quad \text{you} \end{array}$$

The strong Q-feature is checked by copying *which pictures of his parents*, which is the minimal maximal projection containing the Q-feature required for convergence, as shown below:

$$(34) \quad \begin{array}{l} \text{a.} \quad [C^{\max} C [T^{\max} T [V^{\max} \text{ you } [\text{think } [C^{\max} \text{ that } [T^{\max} T [V^{\max} \text{ every man } [\text{likes } [D^{\max} \text{ which}_{[Q]} \text{ picture of } \\ \text{his parents}]]]]]]]]]] \end{array}$$







would wrongly predict that bound variable readings are available in examples like (31), where the pronouns are contained within the "fronted" adjuncts. Let us consider (38) again as an example. Recall that under Lebeaux's theory, adjuncts are introduced either cyclically or postcyclically. If the adjunct *because of his scandal* is introduced cyclically, we get the LF-representations in (44):

- (44) a.    **[which x]** [you think that every congressman remembers **[x criticism because of his scandal]]**  
           b.    **[which x, x criticism because of his scandal]** [you think that every congressman remembers x]

If the adjunct *because of his scandal* is introduced postcyclically, the LF-representations in (45) are derived:

- (45) a.    **[[which x] because of his scandal]** [you think that every congressman remembers **[x criticism]]**  
           b.    **[[which x, x criticism] because of his scandal]** [you think that every congressman remembers x]

Among these four LF-representations, the preference principle chooses (44a) and (45a), where the operator positions are minimized, and excludes (44b) and (45b). Although the pronoun *his* is not c-commanded by the quantificational phrase *every congressman* in (45a), the former is c-commanded by the latter in (44a). Hence, Lebeaux's theory would predict that the pronoun *his* may be interpreted as a variable bound by the quantificational phrase *every congressman*, contrary to fact.

### 6.2.2 Complex NPs and the Reconstruction Effects

If the analysis presented above is correct, we should expect that bound variable readings are not available when pronouns are contained within "fronted" complex NPs. This is because the appositive and relative clauses within complex NPs are adjuncts and thus forced to be merged with main structures postcyclically. This prediction is borne out:<sup>6</sup>

(46) Relative Clauses

- a. \*[which evidence [that **he**<sub>i</sub> presented in court]] do you think that **every congressman**<sub>i</sub> lied about *t*
- b. ??[which evidence [that **his**<sub>i</sub> attorney presented in court]] do you think that **every congressman**<sub>i</sub> still remembers *t*
- c. \*[which claim [that **he**<sub>i</sub> made in court]] do you think that **every congressman**<sub>i</sub> lied about *t*
- d. ??[which claim [that **his**<sub>i</sub> attorney made in court]] do you think that **every congressman**<sub>i</sub> still remembers *t*

(47) Non-Relative Complex NPs

- a. \*[which evidence [that **he**<sub>i</sub> received a bribe from the company]] do you think that **every congressman**<sub>i</sub> will ignore *t*

---

<sup>6</sup>Lebeaux (1991) claims that the complex NP cases like (46-47) are not deviant. Contrary to Lebeaux's observations, there is a clear contrast in acceptability between the complement cases like examples in (30) and the complex NP cases like those in (46-47), though the degree of deviance of the latter varies among speakers.

- b. ??[which evidence [that **his<sub>i</sub>** secretary received a bribe from the company]] do you think that **every congressman<sub>i</sub>** will ignore *t*
- c. \*[which story [that **he<sub>i</sub>** kills the monster]] do you think that **every student<sub>i</sub>** likes *t* best
- d. \*[which story [that **his<sub>i</sub>** friend kills the monster]] do you think that **every student<sub>i</sub>** likes *t* best

Let us consider (46a) and (47a) as examples. The relative clause *that he presented in court* in (46a) and the appositive clause *that he received a bribe from the company* in (47a) are both adjuncts and thus required to be merged with the main structures postcyclically.

Especially, when we come to the stage of the derivations where the strong Q-feature of C is to be checked, those clauses have not been merged with the main structures. They are merged with the *wh*-phrases after the latter undergoes Copy to check the Q-feature of C. LF-representations (48) and (49) are assigned to (46a) and (47a), respectively, after application of the operation for construction of an operator-variable structure and the preference principle:

(48) [[**which x**] that he presented in court] [you think that every congressman lied about [**x evidence**]]

(49) [[**which x**] that he received a bribe from the company] [you think that every congressman will ignore [**x evidence**]]

In neither (48) nor (49), the pronoun *he* is c-commanded by the quantificational phrase *every congressman*. Hence, *he* cannot be interpreted as a variable bound by *every congressman*. The other examples in (46) and (47) can be accounted for in the same fashion.

To recapitulate this section, our theory of phrase structure together with the assumption that variable binding relations are established at LF can account for the argument/adjunct asymmetry concerning the reconstruction effects with variable binding. It was also shown that this asymmetry constitutes evidence in favor of our theory, where adjuncts are forced to be merged postcyclically, and against Lebeaux's (1988, 1991) theory, where adjuncts are merged either cyclically or postcyclically.

### 6.3 Reconstruction Effects with *Each Other*

This section considers reconstruction effects with *each other*. It is shown that there is an argument/adjunct asymmetry concerning reconstruction effects with *each other*. When *each other* is contained within "fronted" complements, the reconstruction effects are observed. When *each other* is contained within "fronted" adjuncts, on the other hand, the reconstruction effects are abrogated. I will argue that this argument/adjunct asymmetry straightforwardly follows from our theory of phrase structure together with the assumption that the c-command requirement at LF constitutes a necessary condition for the licensing of *each other*.

Before we come to the reconstruction effects, let us consider the interpretation of *each other*. There have been three fundamental approaches to *each other* in generative grammar, i.e., the binding theory approach, the linking theory approach, and the LF-movement approach. The binding theory approach is explored by, among others, Chomsky (1981) and Huang (1983). The linking theory approach was advocated by, among others, Higginbotham (1983) and Montalbetti (1984). The LF-

movement approach was explored by, among others, Chomsky (1986b), Lebeaux (1983), and Pica (1987). It is beyond the scope of this study to consider which approach to *each other* should be preferred over the others. For the purpose of the present discussion, it is sufficient to claim that *each other* is subject to the following condition:

- (50) *Each other* must have a c-commanding antecedent in a certain domain for its proper interpretation.

Every approach assumes this condition as a necessary condition for the proper interpretation of *each other*, though its exact formulations vary among them. This condition is responsible for ruling out examples like (51), where *each other* is not c-commanded by its antecedent *them* at any point of the derivation:

- (51) \***each other<sub>i</sub>** thinks that John admire **them<sub>i</sub>**

The discussion to follow assumes that condition (50) applies at LF.

Returning to the reconstruction effects with *each other*, let us first consider the following examples:

- (52) **they<sub>i</sub>** saw [<sub>D</sub><sup>max</sup> pictures [<sub>P</sub><sup>max</sup> of **each other<sub>i</sub>**]]
- (53) a. **they<sub>i</sub>** were watching [<sub>D</sub><sup>max</sup> the bags [<sub>P</sub><sup>max</sup> around **each other<sub>i</sub>**]] at the airport
- b. **they<sub>i</sub>** were looking at [<sub>D</sub><sup>max</sup> the girls [<sub>P</sub><sup>max</sup> near **each other<sub>i</sub>**]] on the beach

In (52), *each other* appears within the complement P<sup>max</sup> and can take *they* as its antecedent. In (53a-b), on the other hand, *each other* is in the adjunct P<sup>max</sup>. Although the judgments vary, there are some speakers who accept examples like (53).

If we "front" the  $D^{\max}$  containing *each other* by wh-movement, however, an argument/adjunct asymmetry emerges:

(54) [which pictures [of **each other**<sub>i</sub>]] did **they**<sub>i</sub> see *t*

(55) a. ?[which of the bags [around **each other**<sub>i</sub>]] were **they**<sub>i</sub>  
watching *t* at the airport

b. ?[which of the girls [near **each other**<sub>i</sub>]] were **they**<sub>i</sub>  
looking at *t* on the beach

(54) prima facie violates condition (50), since *each other* is moved out of the c-command domain of its antecedent *they*. Nonetheless, (54) is acceptable. In (54), the phrase which contains *each other* is interpreted as if it were in its trace site. In other words, the reconstruction effects concerning the interpretation of *each other* are observed. (55a-b), on the other hand, are deviant even for the speakers who accept (53a-b). In (55), the reconstruction effects are abrogated. The difference between (54) and (55) resides in the fact that *each other* is contained within the complement of the noun in the former while it is contained within the adjunct in the latter. I will argue that this argument/adjunct asymmetry concerning the reconstruction effects with *each other* straightforwardly follows from our theory of phrase structure.

Let us first consider (54). According to our theory of phrase structure, *of each other* in (54), being an argument, is required to be merged with the main structure in a cyclic manner. Especially, it has already been merged with *which pictures* when the strong Q-feature of C is to be checked, as shown below:

(56) a. [<sub>C</sub><sup>max</sup> C<sub>[Q]</sub> [<sub>T</sub><sup>max</sup> T [<sub>V</sub><sup>max</sup> they [see [<sub>D</sub><sup>max</sup> which<sub>[Q]</sub>  
pictures of each other]]]]]]

b. they

Since *which pictures of each other* is the minimal maximal projection containing the Q-feature required for convergence, the strong Q-feature of C is checked by copying *which pictures of each other*:

- (57) a. [C<sup>max</sup> C [T<sup>max</sup> T [V<sup>max</sup> they [see [D<sup>max</sup> **which**<sub>[Q]</sub>  
**pictures of each other**]]]]]  
b. they  
c. [D<sup>max</sup> **which**<sub>[Q]</sub> **pictures of each other**]

After merger of these syntactic objects, we get the following structure, with all formal features including Q-features being ignored:

- (58) [[**which pictures of each other**]<sub>j</sub>; [C [they<sub>k</sub> [T [they<sub>k</sub> [see  
**[which pictures of each other]<sub>j</sub>]]]]]]]]**

Among the chains created by this derivation, (59) is relevant to the present discussion:

- (59) CH = (*which pictures of each other*, *which pictures of each other*)

We then apply the operation for construction of an operator-variable structure. Among the LF-representations generated by this operation, the preference principle chooses (60), where the operator position is minimized:

- (60) [**which x**] [they see [**x pictures of each other**]]

In (60), *each other* is c-commanded by its antecedent *they* and thus properly interpreted. Hence, we can correctly predict that the reconstruction effects with *each other* occur in (54).

Let us next consider the unavailability of the reconstruction effects, taking (55a) (repeated here as (61)) as an example:

- (61) ?[which of the bags [around **each other**<sub>i</sub>]] were **they**<sub>i</sub>  
 watching *t* at the airport

According to our theory of phrase structure, *around each other* in (61), being an adjunct, must be merged with the main structure postcyclically. Especially, at the stage when the strong Q-feature of C is to be checked, the adjunct *around each other* has not been merged with *which of the bags*:

- (62) a. [C<sup>max</sup> C<sub>[Q]</sub> [T<sup>max</sup> T [they were watching [D<sup>max</sup> which<sub>[Q]</sub> of the bags]]]]  
 b. they  
 c. [P<sup>max</sup> at the airport]  
 d. [P<sup>max</sup> around each other]

The strong Q-feature of C is therefore checked by copying *which of the bags*:

- (63) a. [C<sup>max</sup> C [T<sup>max</sup> T [they were watching [D<sup>max</sup> **which**<sub>[Q]</sub> **of the bags**]]]]  
 b. they  
 c. [P<sup>max</sup> at the airport]  
 d. [P<sup>max</sup> around each other]  
 e. [D<sup>max</sup> **which**<sub>[Q]</sub> **of the bags**]

After merger of these syntactic objects, we get the following structure, with all formal features including Q-features being ignored:

- (64) [[[**which of the bags**]<sub>j</sub> [around each other]] [C  
 [they<sub>k</sub> [T [they<sub>k</sub> [were watching [**which of the bags**]<sub>j</sub> at the  
 airport]]]]]]]]

Among the chains created in this derivation, (65) is relevant to the present discussion:

(65) CH = (*which of the bags, which of the bags*)

Note that the adjunct *around each other* is not part of the chain, since it is merged with *which of the bags* after the latter undergoes Copy to check the strong Q-feature of C. The operation for construction of an operator-variable structure applies to (65). Among the representations derived by this operation, the preference principle chooses (66):

(66) [[**which x**] around each other] [they were watching  
[**x of the bags**] at the airport]

In (66), *each other* is not c-commanded by its antecedent *they*; this violates condition (50). Hence, we can correctly predict that examples like (61) are deviant.

#### 6.4 Concluding Remarks

This chapter has considered the argument/adjunct asymmetries concerning the reconstruction effects with Condition C of the binding theory, variable binding, and the interpretation of *each other*. It was shown that the asymmetries straightforwardly follow from our theory of the composition of phrase structure together with the assumption that binding relations are established at LF. Recall that the preceding chapters have extensively argued that the locality restrictions on movement follow from our theory of phrase structure. Our theory of phrase structure therefore receives strong empirical support from the fact that its effects are observed in the two totally different kinds of relations, i.e., movement and binding relations.