ON ACROSS-THE-BOARD MOVEMENT

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This article argues for an Across-the-Board (ATB) movement analysis of parasitic gap (PG) constructions in parallel with coordinate constructions as proposed by Williams (1990). It is argued that the Minimal Link Condition (MLC) proposed by Chomsky (1995) is responsible for ATB movement. If the ATB movement analysis of PG constructions is adopted, the MLC offers a more principled account of the distribution of PGs. It is also argued that the notion of *barrier* still plays an important role in the Minimalist Program. By virtue of barriers, the reconstruction effects observed in PG constructions and coordinate constructions can be explained straightforwardly.*

1. Introduction

Ross (1967) proposes Across-the-Board (ATB) movement rules, which are supposed to affect each conjunct in coordinate constructions in a parallel way. Williams (1978) further argues that a structure such as (1a) is derived from (1b) as a result of ATB movement of *who*:

- (1) a. ... [_{CP} *who*_{i,j} [[_{TP} John saw *t*_i] and [_{TP} Mary hit *t*_j]]]
b. ... [_{CP} [[_{TP} John saw *who*] and [_{TP} Mary hit *who*]]]

As seen in (1a), the *wh*-phrase is extracted from each conjunct and moved to the [Spec, CP] outside the conjuncts. It has been also suggested that the ATB movement analysis can be extended to constructions other than coordinate constructions. According to Williams (1990) (cf. Pesetsky (1982), Ross (1967), etc.), ATB movement also occurs in parasitic gap (PG) constructions like (2a):

- (2) a. What did you file *t* before reading *e*?
b. [_{CP} *what*_{i,j} did [_{TP} you file *t*_i [before reading *t*_j]]]

Although the structure differs from coordination, (2b) illustrates mul-

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tiple movement by ATB similar to (1a).¹

In this article, I will argue for an ATB analysis of PG constructions in parallel with coordinate constructions. There are two main points which I want to make. The first concerns a certain property generally observed in ATB movement. If ATB movement is an instance of a movement operation, it should obey the general principles which constrain movement. Within Chomsky's (1995) framework, as distinct from the traditional Principles and Parameters approach, the operation Attract/Move as such is assumed to be defined by inviolable conditions. I will argue that among such conditions, the Minimal Link Condition (MLC) is responsible for ATB movement. That is, the MLC constrains ATB movement. Moreover, it will be argued that the so-called anti-c-command condition can be subsumed under the MLC once an ATB movement analysis of PG constructions is adopted. The second point focuses on the difference between PG constructions and coordinate constructions. It has often been noted that in PG constructions, there are asymmetries between the gaps involved; namely, the licensing trace and the PG. One such asymmetry can be found in reconstruction effects. For example, reconstruction is allowed in the licensing trace but not in the PG in the context of Principle A of the Binding Theory. On the other hand, in coordinate constructions, there seems to be no such asymmetry. If such a difference exists, it poses a serious problem for an ATB movement analysis of PG constructions. To solve this problem, I argue that the notion of *barrier* should still be valid in the Minimalist Program.

The organization of this article is as follows. Section 2 reviews the basic roles of the MLC proposed in Chomsky (1995). Section 3 suggests that the *superiority effect* of the MLC and ATB movement are closely related to each other in that ATB movement is available when and only when the superiority effect cannot obtain. It is argued that owing to the ATB movement analysis, the anti-c-command condition on PG constructions can be reduced to the MLC. The notion of barrier is also introduced for an explanation of reconstruction effects. Section 4 compares coordinate constructions with PG constructions and

¹ Williams (1990) attempts to capture the similarity between coordinate constructions and PG constructions by proposing that the latter should be analyzed as a kind of coordination with an abstract coordinator (COORD).

argues that the latter but not the former involve a barrier which affects reconstruction. Furthermore, we will see the possibility of two types of conjunction: coordinator *and* and subordinator *and*. Section 5 concludes the article.

2. The MLC, the Superiority Effect, and ATB

In Chomsky (1995), the operation Attract/Move is assumed to involve the MLC as part of its definition, and hence no movement violates it.² The definition of the MLC is as follows:

- (3) a. K attracts α only if there is no β , β closer to K than α , such that K attracts β . (ibid.: 311)
 b. β is closer to the target K than α if β c-commands α .^{3,4} (ibid.: 358)

Here, movement is taken to be a consequence of *attraction* by (the feature of) the target K. As stated in (3), α cannot be attracted unless α is closer to K than any other candidates where the feature of K checks the feature of α .

² Besides the MLC, Chomsky (1995) assumes three conditions that compose the definition of Attract/Move. They are given in (i)–(iii):

- (i) The Last Resort Condition
 Move F raises F to the target K only if F enters into a checking relation with a sublabel of K. (ibid.: 280)
 (ii) The C-command Condition
 α must c-command its trace. (ibid.: 253)
 (iii) The Uniformity Condition
 A chain is uniform with regard to phrase structure status [where the *phrase structure status* of an element is its (relational) property of being maximal, minimal, or neither]. (ibid.: 253)

³ In Chomsky (1995), the *equidistance principle*, which is given below, is built into the definition of *closeness* in (3b):

- (i) γ and β are equidistant from α if γ and β are in the same minimal domain.

As suggested by Chomsky, however, the notion of closeness could be defined without equidistance. In this article, I will assume the definition in (3) without equidistance.

⁴ In the following discussion, I will use the definition of c-command as given below (cf. Chomsky (1995), Kayne (1994)):

- (i) a. X c-commands Y iff X and Y are categories and X excludes Y and every *node* that dominates X dominates (the lower segment(s) of) Y.
 b. X excludes Y if no segment of X dominates Y.

The MLC imposes locality on movement, and it essentially covers the phenomena which have been accounted for by Rizzi's (1990) Relativized Minimality (the Empty Category Principle or ECP) and the *wh*-island condition (Subjacency). Thus, (4) is barred by the MLC:

- (4) *Guess [_{CP} to whom_j they remember [_{CP} which book_i John gave t_i t_j]].

More precisely, (4) could never be derived. When the derivation reaches the stage of (5), *which book* in the embedded [_{Spec}, CP] is closer to the higher C(P) which has the [Q] feature than *to whom*:

- (5) [_{CP} C⁰ [Q] [_{TP} they remember [_{CP} which book_i C⁰ [Q] [_{TP} John gave t_i to whom]]]]]

In accordance with the MLC, we expect (6) rather than (4):

- (6) *Guess [_{CP} which book_i they remember [_{CP} t_i John gave to whom]].

Chomsky (1995) speculates that the embedded interrogative clause with no *wh*-phrase in its [_{Spec}, CP] cannot be interpreted as a *wh*-question and the derived sentence results in gibberish. In the following discussion, the locality effect of the MLC is not directly relevant, so I will not go further into it here. For details, see Chomsky (1995) and others.

In addition to guiding cyclic movement, the MLC has another function which would be called the *superiority effect*. That is, it explains the phenomena which fall under Chomsky's (1973) Superiority Condition.⁵ The Superiority Condition rules in (7a) and rules out (7b):

- (7) a. Who_i does Mary expect t_i to see who?
b. *Who_i does Mary expect who to see t_i?

Although both (7a) and (7b) are multiple *wh*-questions with two *wh*-phrases, only (7a) is possible. In (7a), the *wh*-phrase which asymmetrically c-commands the other is moved. In (7b), on the other hand, the *wh*-phrase which is asymmetrically c-commanded by the other is moved. Put differently, only the *wh*-phrase which is closest to the

⁵ Notice that the definition of the MLC in (3) is not very different from Chomsky's (1973) definition of the Superiority Condition:

- (i) a. No rule can involve *X*, *Y* in the structure
...*X*...[_α...*Z*...*WYV*...].
where the rule applies ambiguously to *Z* and *Y* and *Z* is superior to *Y*.
b. [T]he category *A* is 'superior' to the category *B* in the phrase marker if every major category dominating *A* dominates *B* as well but not conversely.

target C(P) is attracted. Thus, the superiority effect observed in (7) derives from the MLC.

As we have just seen, the MLC selects only the *wh*-phrase which is placed higher than the others in the c-command configuration. For this reason, one might expect that it is impossible for more than one *wh*-phrase to be attracted simultaneously as shown in the following example:

(8) *Who_{i,j} does Mary expect *t_i* to see *t_j*?

Now, compare (8) with the examples of multiple gap constructions in (9):

(9) a. Which film_{i,j} did the critics hate *t_i* and the audience love *t_j*?

b. What_{i,(j)} did you file *t_i* before reading *t_j*?

(9a) contrasts with (8) in quite an interesting way. In distinction to (8), (9a) allows the two *wh*-phrases (*which film_{i,j}*) to move to the sentence-initial position (i.e. [Spec, CP]) from the both conjuncts by ATB, yielding a multiple gap construction. (9b), on the other hand, is an example of a PG construction, which is also a multiple gap construction. PG constructions have sometimes been analyzed as involving multiple A'-movement. Furthermore, as suggested by Williams (1990) among others, the multiple movement in PG constructions could actually be an instance of ATB movement, which is also involved in coordinate constructions like (9a).⁶ If we assume this, the PG (*t_j*) in the adjunct in (9b) is regarded as a *wh*-trace created by ATB movement. Such an analysis brings about an intriguing consequence concerning the relationship between the distribution of PGs and the MLC. In the next section, I will pursue an ATB movement analysis of PG constructions. However, I do not intend to claim that ATB movement is particular to coordinate constructions and, therefore, PG constructions should also involve a kind of coordination (see footnote 1). To avoid confusion, let us assume here that ATB movement is the operation where more than one category (with identical phonetic

⁶ Munn (1992) takes the opposite direction. Namely, ATB movement in coordinate constructions is subsumed under PG operator movement.

contents) is attracted by a single target at the same time.⁷

3. The ATB Movement Analysis of PG Constructions

In this section, I want to show the advantages of the ATB movement analysis of the PG constructions. Conceptually, the ATB movement analysis shows us the correlation between multiple movement in PG constructions and the MLC, and it enables us to reduce the anti-c-command condition on PGs to the MLC. More empirically, we will see that the reconstruction effects observed in PG constructions can be attributed to ATB movement and the notion of barrier.

3.1. Reducing the Anti-c-command Condition to the MLC

Despite some difficulties (see Contreras (1984), Chomsky (1986), and others), since the pioneering work by Taraldsen (1981), it has been widely accepted that the PG cannot be c-commanded by the licensing A'-trace. Thus, in (10) (= (9b)), the trace in the object position of *file*

⁷ I assume that ATB movement results in a ternary-branching structure like (i) in which both XP and YP are in [Spec, CP]:

Suppose that if XP and YP are phonetically identical in such a configuration, one of them can delete the other under the recoverability condition (see Williams (1978)). Otherwise, the derivation will crash at PF, violating Kayne's (1994) Linear Correspondence Axiom (LCA) which can be recapitulated as (ii):

- (ii) a. Let X, Y be nonterminals and x, y terminals such that X dominates x and Y dominates y. Then if X asymmetrically c-commands Y, x precedes y. (ibid.: 33)
 b. X asymmetrically c-commands Y iff X c-commands Y and Y does not c-command X. (ibid.: 4)

Thus, it turns out that examples like (iiic, d) cannot be realized since the two *wh*-phrases which move to [Spec, CP] by ATB are not phonetically identical and neither of them can be deleted (thus, a violation of the LCA):

- (iii) a. [CP (did) [TP you [see *which person*] and [talk to *which person*]]]
 b. [CP *which person*_i, to *which person*_j did [TP you [see t_i] and [talk t_j]]]
 c. *To *which person* did you see and talk?
 d. *Which *person* did you see and talk?

The same is assumed to apply to PG constructions.

(t_i) does not c-command the one in the adjunct PP (t_j), and vice versa:

- (10) [_{CP} what_{i,j} did [_{TP} you [_{VP} file t_i] [_{PP} before reading t_j]]]

As in (11), it is true that the anti-c-command condition is effective in another instance of PG constructions:

- (11) Who_{i,j} would a picture of t_i surprise t_j ?

[_{CP} who_{i,j} would [_{TP} [_{DP} a picture of t_i] [_{Tr} [_{VP} surprise t_j]]]]

In this case, the PG trace is embedded in the subject DP in [Spec, TP] whereas the licensing trace is in *v*P. Therefore, neither c-commands the other, so the anti-c-command condition holds. The following pair also illustrates the condition clearly: when the two traces (the PG trace and the licensing trace) are in a c-command relation as seen in (12a), the PG cannot be licensed, in contrast with (12b):

- (12) a. *a man [_{CP} who_{i,j} [_{TP} t_i looks old [whenever I meet t_j]]]
 b. a man [_{CP} who_{i,j} [whenever I meet t_j] [_{TP} t_i looks old]]

(Chomsky (1986: 54))

Now, remember that, among more than one candidate, the MLC only allows the highest one in the c-command configuration to move. Thus, (13a) ends up manifesting the superiority effect as in (13b) while the multiple movement in (13c) is blocked:

- (13) a. (I wish I knew) [_{CP} C^0 [Q] [_{TP} who expects [_{CP} that Mary will marry who]]]
 b. (I wish I knew) who_i t_i expects that Mary will marry who
 c. *(I wish I knew) who_{i,j} t_i expects that Mary will marry t_j

As the MLC requires, only the *wh*-phrase in the matrix subject position is attracted in (13b) since it is closer to the target than the other *wh*-phrase, which remains in situ. In the PG constructions given above, the MLC cannot select only one candidate to move since there is no c-command relation between the candidates. In such cases, it is quite natural to consider that the MLC operates only vacuously, and in accordance with Last Resort and other conditions on Attract/Move (see footnote 2), every attractable candidate is moved to the target. In other words, the MLC determines when *wh*-in-situ is allowed as in (13b) and when multiple movement is allowed as in PG constructions (and coordinate constructions, which we will see in section 4).

3.2. How to License the PG: Barriers to PG Chain Construction

There arise some problems, however, if we try to analyze PG constructions as involving ATB movement. As is well-known, PGs

occur mostly in environments where nothing can be extracted. Thus, the following examples contrast with PG constructions: it is impossible to associate the sentence-initial *wh*-phrases with their traces:

- (14) a. *What_i did you file the papers before reading t_i?
 b. *Who_i would a picture of t_i surprise John?

These examples used to be ruled out by the Subjacency Condition (or Huang's (1982) Condition on Extraction Domain). How can we reconcile the PG examples with the Subjacency violation examples?

Comparing the examples in (14) with those in (15), we note the difference between them is that only the latter examples involve A'-chains that license the PGs:

- (15) a. What_{i,j} did you file t_i before reading t_j?
 b. Who_{i,j} would a picture of t_j surprise t_i?

In (15a, b), the movement from the licensing trace positions (*t_i*) does not violate the Subjacency Condition while the movement from the PGs (*t_j*) does. In order to capture the extractability from the adjunct and the subject as in (15a, b), I assume that the notion *barrier* is still valid in the Minimalist Program.⁸ It should be, however, changed from Chomsky's (1986) version to hold in the new framework. I assume that barriers are relevant in deciding whether two copies of a moved category, α_i and α_{i+1} , construct a legitimate chain which can enter into the LF representation, rather than in deciding whether a trace is licensed (the ECP) or whether long-distance movement is possible (Subjacency). Here, let us stipulate the following condition on chains as a Full Interpretation (FI) principle:

- (16) If (α_i , α_{i+1}) is a link of a chain, no barrier intervenes between α_i and α_{i+1} .

Then, suppose that every (maximal) category has potential barrierhood as an inherent lexical property. According to Chomsky and Lasnik (1993), XP is not a barrier if it is the complement of a head H (or the

⁸ As an alternative approach, Manzini (1994), for example, analyzes PG constructions adopting Chomsky's (1993) version of the Minimalist Program and eliminating barriers. Her approach, however, does not seem compatible with Chomsky's (1995) version, which this article is based on. For details, see Manzini (1994).

Spec of the complement of H).⁹ In Minimalist terms, the complement of H will be the member of the internal domain of H, ID(H), which is usually a singleton set. The definition of ID(H) is in (17):

- (17) ID(H) is the smallest subset of the complement domain of H, CD(H), where γ , γ' a member of ID(H), is not dominated by any other members of CD(H).

In turn, CD(H) and the domain of H, D(H), are defined as follows:

- (18) a. CD(H) is the subset of D(H) whose members are reflexively dominated by the complement of H.
 b. D(H) is the set of categories included in the smallest maximal projection of H that are distinct from and do not contain H.

With these definitions, let us say that the barrierhood of the category XP is suppressed if XP is in the ID(H).

Returning to the examples in (14) and (15), we expect that extraction from the adjunct and the subject is ruled out by the condition in (16). As for the (b) examples of (14) and (15), since the subject DPs occupy [Spec, TP], which is not the complement of any head, they remain barriers to chain construction. So, the legitimate chains can never be created from within [Spec, TP]. As for the (a) examples, it is necessary to elucidate the structure of adjunction. As frequently assumed in the literature, let us suppose that the adjuncts in the (a) examples of (14) and (15) are adjoined to ν P, the upper part of a layered VP (see Chomsky (1995), etc.), as shown in (19):

⁹ Citing Torrego (1985), Chomsky and Lasnik (1993) note that the barrierhood of [Spec, IP] cannot be circumvented even though the IP (=TP) is the complement of C⁰. Thus, in the following contrast in Spanish, (ia) is acceptable whereas (ib) is not:

- (i) a. de que autora_i [no sabes [_{CP} [qué traducciones t_i]_j [_{IP} t_j han ganado premios internacionales]]]]
 'by what author_i [don't you know [_{CP} [what translations t_i]_j [_{IP} t_j have won international awards]]]]'
 b. *esta es la autora [_{CP} [de la que]_i C⁰ [_{IP} [varias traducciones t_i] han ganado premios internacionales]]]
 'this is the author [_{CP} [by whom]_i [_{IP} [several translations t_i] have won international awards]]'

For the moment, I assume with Chomsky and Lasnik that categories other than C⁰ suppress the barrierhood of the Spec of their complements. Possibly, this might be due to some property (e.g. *L-/θ-relatedness*) of the head, though I leave it open for future study.

Incidentally, if we respect Kayne's (1994) LCA (see footnote 7), which has been adopted by Chomsky (1995) as a principle of the phonological component, the linear ordering of the adjunct with respect to the vP would be in conflict with its syntactic position. Under the LCA, adjunction must be invariably leftward, and rightward adjunction is completely precluded. Such a narrow view of phrase structure incurs some difficulties in explaining the positioning of adjuncts. Regarding this point, Collins and Thráinsson (1996: 417 fn.37) suggest that the LCA applies only to core processes. Adopting their view, we could take adjuncts to be irrelevant to the core ordering imposed by the LCA. Rather, they might be ordered by the *canonical precedence relation*, a kind of directionality parameter, which is fixed from language to language (see Fukui (1993) for the directionality of optional movement). Under this view, English prefers rightward adjunction.

In (19), the adjunct PP is not in the complement of any heads, so its barrierhood will not be suppressed. If α , which is dominated by PP in (19), is extracted from PP as in the (a) examples of (14) and (15), the unsuppressed barrier (PP) will intervene between α and its trace t_α , left behind within PP. As a consequence, α and t_α will count not as members of a chain but as illegitimate objects at LF, which will cause the derivation to crash. In reality, however, (15a) is more or less acceptable, whereas (14a) will be ruled out as predicted.

3.3. Reconstruction Effects in PG Constructions

Why are PG constructions such as (15a) acceptable even though a barrier intervenes? Traditionally, it has been assumed that the PG is dependent on the licensing gap. In Chomsky (1986), such a dependency is expressed in terms of chain composition. By chain composition, the two separate chains (i.e. the licensing A'-chain and the empty PG operator chain) become members of a single chain at LF:

(20) What_i did you file t_i [_{PP} Op_j before reading t_j]?

CH1: (what_i, t_i), CH2: (Op_j, t_j)
 => CH1+2: (what_i, t_i, Op_j, t_j)

If the content of the empty PG operator chain is filled by that of the licensing chain, any member of the composed chain should maintain identical content when reconstructed. It has been reported, however, that there arises an asymmetry in that only the licensing trace, but not the PG, can undergo reconstruction at LF. Thus, in the following examples, originally due to Kearney (1983), only the trace in the licensing chain is visible for the Binding Theory:

- (21) a. [Which books about himself_i] did John_i file t before Mary read *e*?
 b. *[Which books about herself_i] did John file t before Mary_i read *e*?

Similarly, according to Haik (1985), the sloppy identity reading of the reflexive is not allowed in the sentence like (22):

- (22) [Which picture of himself_{i/*j}] did John_i paint t before Peter_j bought *e*?

One might suppose that chain composition takes place post-syntactically and therefore the Binding Theory is irrelevant to the empty operator chain (cf. Munn (1994)). On the other hand, Williams (1990) notes that reconstruction appears to take place in the PG position (*e*) in examples like (23), which brings about the violation of Principle C:

- (23) *[Whose_i mother] did we warn t before he_i arrested *e*?

Then, if Binding Theory applies at LF as suggested by Chomsky (1993), the reconstruction asymmetry observed in (21) and (22) is not simply due to the empty PG operator.

Now, let us continue to assume the ATB movement analysis rather than the chain composition analysis in the sense of Chomsky (1986). When *wh*-phrases are moved by ATB, copies are left in the licensing trace position and in the PG position. (22), for example, will have the following structure:

- (24) [_{CP} [*wh_x*, *x picture of himself*], [*wh_y*, *y picture of himself*]
 [_{TP} John T⁰ painted [*wh_x*, *x picture of himself*] [_{PP} before
 [_{TP} Peter T⁰ bought [*wh_y*, *y picture of himself*]]]]]

According to Chomsky (1993), in order to form a legitimate operator-variable construction, the restriction contained in the *wh*-phrase which occupies the operator position, or [Spec, CP], must be rendered as minimal as possible (the Preference Principle for Reconstruction), while the copy of the *wh*-phrase in the variable position must delete

what remains in the operator position. I will call the operations involved as a whole *Op-vbl formation*. (25) is the result of *Op-vbl formation*:

- (25) [_{CP} [*wh_x*], [*wh_y*] [_{TP} John T⁰ painted [*x picture of himself*] [_{PP} before [_{TP} Peter T⁰ bought [*y picture of himself*]]]]]]

In Chomsky (1993), the antecedent of an anaphor is determined by LF movement of (part of) the anaphor, and in Chomsky (1995), covert movement is limited to formal features. Then, suppose that T(ense)⁰ attracts the anaphor feature of the reflexive in the covert component. Thus, in (25), anaphor feature movement occurs, and we will obtain (26):

- (26) [_{CP} [*wh_x*], [*wh_y*] [_{TP} John T⁰-[self] painted [*x picture of t_{self}*] [_{PP} before [_{TP} Peter T⁰-[self] bought [*y picture of t_{self}*]]]]]]

However, if (26) is the LF representation of (22), sloppy identity should arise since the anaphor in the adjunct PP can have an antecedent (*Peter*) within the PP.

Recall that it is impossible to construct a chain by extraction from an adjunct which retains its barrierhood. In (22), as well as in the (a) examples of (14) and (15), the copy of the *wh*-phrase is created within the adjunct PP by movement. Nonetheless, since a barrier (PP) intervenes, a chain cannot be constructed. As a result, the *wh*-phrase in [Spec, CP] and its copy in the PG position will not be taken to be legitimate objects at LF, and the derivation will not converge. I hypothesize that *Op-vbl formation* only applies to chains. Hence, the illegitimate *wh*-copies cannot be subject to it.

3.4. Operator Incorporation and Unselective Binding

3.4.1. The Absence of the Sloppy Identity Reading

If the ATB movement analysis of PG constructions can be maintained, we can demonstrate that the MLC, a principle of UG, subsumes the anti-c-command condition as a construction-specific descriptive generalization, to the degree that the latter is valid. To solve the reconstruction problem raised above, I argue that the licensing chain salvages the illegitimate *wh*-copies and saves the derivation. To be more specific, the *wh*-operator in the licensing chain incorporates another *wh*-phrase in the same [Spec, CP], which should be linked to its copy embedded in the adjunct PP. Thus, taking the structure in (24) as the input, operator incorporation results in

(27):¹⁰

- (27) [_{CP} [*wh_{x=y}*, *x=y picture of himself*] [_{TP} John T⁰ painted [*wh_x*, *x picture of himself*] [_{PP} before [_{TP} Peter T⁰ bought [*wh_y*, *y picture of himself*]]]]]

Without operator incorporation, the *wh*-phrase which originates from the PG will be interpreted as an illegitimate object, and will be barred by FI. Next, Op-vbl formation applies to (27). The output will be (28):

- (28) [_{CP} [*wh_{x=y}*] [_{TP} John T⁰ painted [*x picture of himself*] [_{PP} before [_{TP} Peter T⁰ bought [*wh_y*, *y picture of himself*]]]]]

Notice that in (28), only the real members of the licensing chain undergo Op-vbl formation but the *wh*-copy in the PG position does not. This is because Op-vbl formation is applied to chains which consist of copies of the moved category with no intervening barriers. If nothing happens, the *wh*-copy in the PG position remains as an illegitimate object. To rescue the stray *wh*-copy, its content deletes leaving the variable, as depicted below:

- (29) [_{CP} [*wh_{x=y}*] [_{TP} John T⁰ painted [*x picture of himself*] [_{PP} before [_{TP} Peter T⁰ bought [*y*]]]]]

Now, if we suppose that the unified operator behaves as an unselective binder, *y* can enter the operator-variable construction even though *y* still is not a real member of the licensing chain.¹¹ Finally, we can

¹⁰ The consequence of operator incorporation suggested above should be distinguished from that of a similar LF operation called *absorption* proposed by Higginbotham and May (1981). As in (i), the latter operation optionally creates a single operator from two operators, which do not have to share the identical restriction (e.g. *who* and *what* in *Who bought what?*):

(i) [*wh_x*], [*wh_y*] ⇒ [*wh_x*, *wh_y*]

Operator incorporation, on the other hand, takes two operators with the exact same restriction and unifies them, as seen in (27).

¹¹ Several researchers such as Cinque (1990), Emonds (1985), Frampton (1990), Munn (1992), and Postal (1993) note that English PGs are limited to (argument) DPs as seen in (i), whereas there is no such limitation in the case of the ATB gap in coordinate constructions as seen in (ii):

(i) a. *How sick did John look *t* without actually feeling *e*?
 b. *How did Deborah cook the pork *t* after cooking the chicken *e*?
 (ii) a. How sick did John look *t* and (Betty) say he actually felt *t*?
 b. How did Deborah cook the pork *t* and Jane cook the chicken *t*?

(Postal (1993: 736))

We might explain the ungrammaticality of (ia, b) by assuming that unselective binding only concerns (indefinite) DPs as was originally proposed in Heim (1982). Suppose that the stray *wh*-copy in the PG position can be salvaged only if its head

apply anaphor feature movement to (29) and arrive at (30):

- (30) [CP [*wh_{x=y}*] [TP John T⁰-[self] painted [*x picture of t_{self}*] [PP before [TP Peter T⁰ bought [*y*]]]]]

We can thus explain why the sloppy identity reading of the reflexive is disallowed in the PG position. Such an explanation is also available for the cases in (21).

3.4.2. The Principle C Violation

Let us see whether the proposed analysis works with another reconstruction effect in PG constructions. In (31) (= (23)), the trace in the PG position (*t_y*) seems to be reconstructed, causing a violation of Principle C:

- (31) *Whose_i mother_{x,y} did we warn *t_x* [PP before he_i arrested *t_y*]?

Consider the reconstructed structure of (31) which is given in (32):

- (32) [CP [[*wh_x, x person*]'s mother], [[*wh_y, y person*]'s mother] [TP we warned [[*wh_x, x person*]'s mother] [PP before he arrested [[*wh_y, y person*]'s mother]]]]]

It should be noticed that the two copies of *whose* (*mother*)_y, or [*wh_y, y person*](*'s mother*), do not construct a chain since a barrier (PP) intervenes. By hypothesis, Op-vbl formation does not apply to these copies. Before Op-vbl formation applies to the licensing chain, operator incorporation must occur, as in the Principle A cases:

- (33) [CP [[*wh_{x=y}, x=y person*]'s mother] [TP we warned [[*wh_x, x person*]'s mother] [PP before he arrested [[*wh_y, y person*]'s mother]]]]]

Then, Op-vbl formation follows, which only applies to the licensing chain:

- (34) [CP [[*wh_{x=y}*]'s mother] [TP we warned [[*x person*]'s mother] [PP before he arrested [[*wh_y, y person*]'s mother]]]]]

The lower copy of [*wh_y, y person*](*'s mother*) has not yet entered a chain. To allow this stray copy in the operator-variable construction, everything deletes except the variable:

- (35) [CP [[*wh_{x=y}*]'s mother] [TP we warned [[*x person*]'s mother] [PP before he arrested [[*y*]'s mother]]]]]

We can see in (35) that the variable *y* will create a Principle C violation

has the [D] feature which hosts definiteness/specificity. This amounts to saying that the PG must be DP, or otherwise it cannot be subject to unselective binding.

if it corefers with the pronoun *he* within the adjunct PP.

On the contrary, Munn (1994) points out that when PG constructions involve (empty) relative operator movement rather than *wh*(-interrogative)-operator movement, a Principle C violation does not occur. (36) is such an example:

- (36) the picture of John_i that he_i sold before he_i painted

If (36) involves ATB movement of the relative operators, the structure looks like (37):

- (37) [DP [DP the picture of John_i] [CP *Op_x*, *Op_y* that [TP he_i sold *t_x* before he_i painted *t_y*]]]

The content of the two empty relative operators (*Op_x*, *Op_y*) is supposed to be supplied by the head DP *the picture of John*. If so, it might be expected that reconstruction like the following is possible:

- (38) [DP [DP the picture of John_i] [CP [*λ_x*, *x the picture of John_i*], [*λ_y*, *y the picture of John_i*] [TP he_i sold [*λ_x*, *x the picture of John_i*] before he_i painted [*λ_y*, *y the picture of John_i*]]]]]

Suppose that (38) undergoes the series of operations which we have seen in (33)–(35). First, operator incorporation applies:

- (39) [DP [DP the picture of John_i] [CP [*λ_{x=y}*, *x=y the picture of John_i*] [TP he_i sold [*λ_x*, *x the picture of John_i*] before he_i painted [*λ_y*, *y the picture of John_i*]]]]]

Next follows Op-vbl formation in the licensing chain:

- (40) [DP [DP the picture of John_i] [CP [*λ_{x=y}*] [TP he_i sold [*x the picture of John_i*] before he_i painted [*λ_y*, *y the picture of John_i*]]]]]

Finally, deletion applies to the stray copy in the PG position:

- (41) [DP [DP the picture of John_i] [CP [*λ_{x=y}*] [TP he_i sold [*x the picture of John_i*] before he_i painted [*y*]]]]]

As in (35), (41) involves two variables, *x* and *y*, which are not distinct. In this case, however, the variable remaining in the PG position (*y*) does not matter because it could never be substituted by nor be coreferential with *John*. On the other hand, the variable position in the licensing chain contains the name. Thus, reconstruction should be blocked in the licensing chain. Munn (1994) argues that in a *wh*-question, the restriction may only appear in the trace position after LF deletion. On the other hand, he argues that in a relative clause, the restriction can be deleted throughout the chain, for it is recoverable by way of the head DP of the extended chain (*the picture of John*, *Op*, *t_{Op}*). Principle C is therefore not violated in (36). This explanation,

however, is not extended to all relatives since the head DP is expected to exhaustively recover the content of the relative operator. Consider the example below:

- (42) *the man whose_i father he_i saw (Munn (1994: 403))

In (42), the relative operator is genitive, and a Principle C violation follows by reconstruction. This fact can be illustrated in the same way as (35):

- (43) [DP [DP the man] [CP [[λ_x , x the man]'s father] [TP he saw [[λ_x , x the man]'s father]]]]
 $\Rightarrow$ [DP [DP the man] [CP [[λ_x]'s father] [TP he saw [[x the man]'s father]]]]

When the pronoun *he* and the variable x are coreferential, a principle C violation results. To accommodate the discrepancy between (36) and (42), I claim that the (empty) relative operator is a kind of (empty) pronoun (*pro*; cf. Browning (1987), Cinque (1990), Contreras (1993)), and it depends on the head DP just for its reference. If it is the case, (41) should be replaced with (44):

- (44) [DP [DP the picture of John_i] [CP [$\lambda_{x=y}$] [TP he_i sold [x *pro*] before he_i painted [y]]]]

In (44), *pro* refers to *the picture of John* but not to *John*. Even though the content of *pro* could be supplied at the post-syntactic level, it is not relevant to Binding Theory, which is assumed to apply to the LF representation.¹² Hence, there occurs no Principle C violation in examples like (36). Note that in (43), the situation seems to remain unchanged if we replace the restriction of the operator *the man* with *pro* which refers to *the man*: the variable x is still bound by the pronoun *he* causing a Principle C violation. The discrepancy between (36) and (42) is then attributed to what *pro* refers to in each example.¹³

To summarize, reconstruction effects in PG constructions can be

¹² The situation would be comparable to the case with an overt pronoun:

(i) John_i saw him_j. (him_j = John_i's father)

Suppose that in (i), *him_j* refers to *John_i's father*. If the former can be substituted for by the latter at LF, (i) should be ruled out as a violation of Principle C just as (ii):

(ii) *John_i saw John_i's father.

This is, however, a wrong prediction. Thus, such substitution cannot occur at the level where Binding Theory applies.

¹³ Such a conjecture should be extended to overt, non-complex relative operators that consist of a relative pronoun alone (e.g. *which*, *who*).

accounted for straightforwardly by an ATB movement analysis with barriers to chain construction. The reconstruction effects, especially Principle C effects, arise because the otherwise illegitimate stray copy in the PG position is deleted, leaving only the variable contained in it. Reconstruction into the PG for Principle A is impossible, not because the content of the empty PG operator chain is not filled but because the restriction contained in the stray copy is completely deleted. Also, the anti-c-command condition on PGs is derived from the MLC, as I have argued in section 3.1. Thus, the ATB movement analysis of PG constructions is strongly supported by both reconstruction effects and the MLC.

4. Coordinate Constructions

So far, we have argued for an ATB movement analysis of PG constructions. Let us now turn to coordinate constructions. In this section, we will see both the similarities and the differences between the two constructions, which further support the analysis presented in the preceding section.

4.1. Parallelism or the MLC?

When we compare coordinate constructions like (45) (= (9a)) with PG constructions, we see that the former are more acceptable than the latter:

- (45) Which film_{i,j} did [_{TP} the critics hate *t_i*] and [_{TP} the audience love *t_j*]?

One might say that ATB movement is available when the structure consists of symmetric conjuncts which are conjoined in a parallel fashion as in (45). In this sense, PG constructions do not involve symmetric conjuncts, so they show marginality to some degree. This is actually pointed out by Williams (1990). The notion *parallelism* in question, however, is not always clear. Thus, as noticed by Williams (1978), the parallelism requirement is not so strict as to the length of the paths. Take (46) as an example:

- (46) I know the man who_{i,j} [_{TP} John likes *t_i*] and [_{TP} we hope [_{CP} [_{TP} *t_j* will win]]].

In (46), two TPs are conjoined but the trace in the right conjunct is more deeply embedded than the one in the left conjunct. Moreover, the trace *t_i* in the left conjunct is in the object position, assigned

accusative Case. On the other hand, t_j in the right conjunct is in the embedded [Spec, TP], assigned nominative Case. Along the lines of our discussion, however, what is crucial is that the two paths created by ATB in (46), as well as in (45), cannot be compared with each other with respect to the MLC since there is no c-command relation between the two categories before they move. In other words, they are equally close to the target. Therefore, the MLC does not block multiple movement to the same target, as we have seen for PG constructions.

4.2. The Structure of Coordinate Constructions

In order to explain the difference between coordinate constructions and PG constructions, let us consider the structure of coordination. Coordination has traditionally been analyzed as consisting of ternary-branching structure like (47):¹⁴

$$(47) \quad [\&P [XP \dots] \&^0 [YP \dots]]$$

In (47), the two conjuncts (XP, YP) are symmetrically conjoined by $\&^0$ (*and*) and they could be seen as $\&^0$'s complements. Furthermore, extraction from coordinate constructions has been assumed to obey Ross's (1967) Coordinate Structure Constraint (CSC):

- (48) In a coordinate structure no conjunct may be moved, nor may any element contained in a conjunct be moved out of that conjunct.

Thus, there is no single extraction as exemplified by (49):

- (49) a. *...which whisky_i [$\&P$ [TP I went to the store] and [TP I bought t_i]]
 b. *...which store_i [$\&P$ [TP I went to t_i] and [TP I bought some whisky]]

On the other hand, extraction from coordinate constructions is systematically allowed by ATB. If a ternary-branching structure like (47) is adopted, such a parallel extraction requirement seems to be well defined. Namely, each symmetrically conjoined category must contain the tail of a chain CH of the same type (A, A', X^0) which is bound by the head of CH, outside $\&P$.

Within an analysis based on Chomsky (1995), however, the structure in (47) raises a problem. When the LCA, a PF principle, applies to

¹⁴ Goodall (1987) proposes a completely different analysis (the three-dimensional analysis) of coordinate constructions, though I will not discuss it here.

(47), we cannot tell which conjunct precedes the other because the two conjuncts mutually c-command each other. As suggested by Ross, a conjunction constitutes a single constituent with the right conjunct but not with the left one. The constituency of the conjunction and the right conjunct is motivated by examples such as (50), cited from Ross (1967):

- (50) a. [John left], [and [he didn't even say goodbye]].
- b. [John left]. [And [he didn't even say goodbye]].
- c. *[[John left] and]. [He didn't even say goodbye].

Following Kayne (1994), I therefore assume that coordinate constructions generally have an asymmetric structure like (51), rather than a symmetric one like (47), where the left conjunct is placed in the Spec and the right conjunct is in the complement of $\&^0$:

- (51) [$\&P$ [$XP \dots$] [$\&' \&^0$ [$YP \dots$]]]

In (51), only the right conjunct, YP , is in the ID of $\&^0$. In the barrier system proposed in section 3.2, extraction is only allowed from within the category in the ID of a head. If so, ATB movement from both conjuncts becomes impossible since the left conjunct is in [Spec, $\&P$]. I propose that suppression of barrierhood is closely related to the categorical property of the head, so that suppression of barrierhood could differ from category to category (cf. footnote 9). Tentatively, I assume that $\&^0$ can suppress the barrierhood of the categories in its minimal domain, $\text{Min}(D(\&))$. The definition of $\text{Min}(D(H))$ is given in (52):

- (52) $\text{Min}(D(H))$ is the smallest subset of $D(H)$ whose members are not dominated by any other members in $D(H)$.
- (18) b. $D(H)$ is the set of categories included in the smallest maximal projection of H that are distinct from and do not contain H .

Conventionally, let us construe the members of $\text{Min}(D(H))$ to be the categories in the Spec and the complement of H^0 . With this stipulation, ATB movement is not blocked.¹⁵

¹⁵ As an alternative, $\&P$ takes a symmetric structure like (47) in the syntactic component (overt+covert) and is modified into an asymmetric structure like (51) in the phonological component. If this is possible, the hierarchical structure of $\&P$ can be mapped onto a linear order by the LCA. Whichever approach is adopted, however, we must solve the paradoxical problem of why the asymmetric structure has symmetric properties, or conversely, to which I have no particular answer. I would like to leave this problem aside for now (though a somewhat related issue will be discussed in section 4.4).

Returning to (45), the *wh*-phrases are extracted from the both conjuncts by ATB and each *wh*-phrase leaves a copy in the trace position:

- (53) [_{CP} [*wh_x*, *x film*], [*wh_y*, *y film*] [&P [_{TP} the critics hated [*wh_x*, *x film*]] and [_{TP} the audience loved [*wh_y*, *y film*]]]]]

Since no barrier intervenes, the two chains in (53) can undergo Op-vbl formation. We will thus obtain (54):

- (54) [_{CP} [*wh_x*], [*wh_y*] [&P [_{TP} the critics hated [*x film*]] and [_{TP} the audience loved [*y film*]]]]]

Notice here that each chain is independently a legitimate object. In this respect, coordinate constructions differ from PG constructions. Given (54), the value assigned to the variable *x* and the one to *y* do not have to be the same. In fact, we can assign different answers to the two *wh*-phrases (Lisa Travis (personal communication)), whereas such an interpretation is impossible in PG constructions.¹⁶ (54) is further modified as (55) if operator incorporation puts the two operators into one:

- (55) [_{CP} [*wh_{x=y}*] [&P [_{TP} the critics hated [*x film*]] and [_{TP} the audience loved [*y film*]]]]]

¹⁶ Munn (1992: 6, fn. 3) mentions a very interesting fact: in the following type of PG constructions, the two *wh*-phrases can be assigned different values from each other. Namely, (i) can be interpreted as (ii):

(i) Who_{i,j} did you give a picture of *t_i* to *t_j*?

(ii) Which two people did you give a picture of one to the other?

Notice that in (i), the two traces are not embedded in an adjunct nor in the subject. According to Larson (1988), the dative constructions such as (i) take the layered VP structure like (iii) (at D-structure):

(iii) [_{VP1} V1 [_{VP2} a picture of who_i [_{V2} give [_{PP} to who_j]]]]]

As seen in (iii), *who_i* is embedded in [Spec, VP2] and *who_j* is in the complement of P. Hence, there will be no barrier to chain construction (see footnote 9). The MLC also allows the two *wh*-phrases to move by ATB. This situation is similar to that of coordinate constructions in that the two chains are independently legitimate without resorting to operator incorporation. Thus, the interpretation (ii) of (i) becomes possible if our analysis is correct. If (i) is marginal to some extent, it might be ascribed to the ambiguous c-command relation between the Theme and the Goal arguments in the dative constructions. The fact that the Goal object of *to* as in (i) acts as if it c-commands the Theme is pointed out by Pesetsky (1995) who cites Burzio (1986) and Aoun and Li (1989). Thus, in (iv), the anaphor (*each other*) embedded in the Theme argument is bound by the Goal argument:

(iv) John gave some pictures of *each other_i* to *the kids_i*.

The two variables in (55) should be assigned the same value now, which seems to be the preferred reading of (45). Recall that in PG constructions, an additional deletion operation must be invoked for the stray copy to be bound by the unified operator. One might suppose that such an additional operation will raise the cost of derivation from an economy point of view. When we try to avoid global economy, however, it is undesirable to compare two or more different derivations at the same time (see Chomsky (1995) and Collins (1997), among others, for details on this issue). Rather, we would say that deletion applies to salvage the stray copy in the PG position as an extraordinary operation and hence it is ranked as a costly operation (Masaharu Katoh (personal communication)). Thus, it might be that the somewhat marginal status of PG constructions is imputable to economy of derivation.

4.3. Reconstruction Effects in Coordinate Constructions

The above explanation of coordinate constructions seems to be tenable, and it is further confirmed by the following reconstruction example:

(56) Which pictures of himself did John buy and Bill paint?

Haïk (1985) claims that in such an example, sloppy identity reading is possible. To see this, consider the reconstructed structure as shown in (57):

(57) [_{CP} [*wh_x*, *x pictures of himself*], [*wh_y*, *y pictures of himself*]]
 [&P [_{TP} John_i bought [*wh_x*, *x pictures of himself*]] and [_{TP}
 Bill_j painted [*wh_y*, *y pictures of himself*]]]]

Op-vbl formation renders (57) as (58):

(58) [_{CP} [*wh_x*], [*wh_y*]] [&P [_{TP} John_i bought [*x pictures of himself*]]
 and [_{TP} Bill_j painted [*y pictures of himself*]]]]

In (58), without unifying the operators, the reflexives contained in the two variables take different antecedents from each other. (59), the result of LF anaphor movement, clearly indicates this possibility:

(59) [_{CP} [*wh_x*], [*wh_y*]] [&P [_{TP} John_i T⁰-[self] bought [*x pictures of*
t_{self}]] and [_{TP} Bill_j T⁰-[self] painted [*y pictures of t_{self}*]]]]

In this case, unifying the two operators is not likely because *pictures of John* and *pictures of Bill* could hardly be identified with each other in a normal context.

Contra Haïk (1985), Munn (1992) argues that examples such as (56) cannot have a sloppy identity reading but rather have the reading in

which the reflexive only refers to the name in the left conjunct:

- (60) Which pictures of himself_{i/*j} did John_i buy and Bill_j paint?

Similarly, in each of (61a, b), the antecedent of the reflexive is in the left conjunct:

- (61) a. Which pictures of himself did John buy and Mary paint?
b. *Which pictures of herself did John buy and Mary paint?

Furthermore, Munn (1992, 1994) adds an example like (62), arguing that reconstruction into the right conjunct trace causes a Principle C violation:

- (62) *Whose_i picture did Mary paint and he_i buy?

Based on these observations, Munn (1992) claims that the second gap in coordinate constructions should be analyzed as a PG. Actually, reconstruction facts clearly overlap with those of the PG constructions we have already seen. Compare (60) and (62) with (63) and (64):

- (63) Which picture of himself_{i/*j} did John_i paint before Peter_j bought? (= (22))

- (64) *Whose_i mother did we warn before he_i arrested? (= (23))

Apart from the Principle C violation in (62) which can be accounted for by our proposal with no difficulty, examples like (60)–(61) are problematic. If Munn's argument is justified, the above analysis of coordinate constructions needs some modification. Otherwise, we might say that the reflexives in (60)–(61) must be coreferential with the proximate name (see Williams (1990)), or the restriction of the *wh*-phrase must be reconstructed only in the left gap (see Munn (1994)).¹⁷

Interestingly, Munn's claim that multiple movement in coordinate

¹⁷ Munn (1994), who does not analyze PG constructions in terms of ATB movement, suggests that Op-vbl formation (his Make-Op) applies to the licensing chain and the PG chain in left-to-right order at the post-syntactic level. Thus, in the cases of (60)–(61), it applies only to the licensing chain. According to Munn, in the following examples reconstruction is only allowed in the left gap, namely, the PG embedded in the subject:

(i) a. Which picture of himself did [every boy who saw t] say Mary liked t?

b. *Which picture of herself did [every boy who saw t] say Mary liked t?

This seems to be consistent with Munn's account but not with ours. Since the subject DP is a barrier to chain construction on our approach, the prediction will be that the *wh*-phrase cannot be reconstructed into the PG position in either case of (ia, b). I have nothing interesting to say about this.

constructions actually involves a PG in the right conjunct suggests that the right conjunct is in fact an adjunct and the coordination is re-analyzed as subordination. Munn assigns the structure like (65) to coordinate constructions, where &P (Munn's BP (Boolean Phrase)) is adjoined to the left conjunct:

- (65) [XP [XP ...] [&P &⁰ [YP ...]]]

The structure in (65) further reminds us that Goldsmith (1985) proposed a somewhat similar, though not identical, structure to account for one of the counterexamples to Ross's CSC other than the ATB case, as in (66):

- (66) How many counterexamples_i can the Coordinate Structure Constraint [sustain t_i] and [still be considered empirically correct]?

In (66), due to Goldsmith (1985: 135), extraction is carried out only from the left conjunct. As mentioned by Goldsmith, this type of extraction also suggests that the conjunction *and* functions as a subordinator. Therefore, it does not seem implausible to distinguish two homophonous *and*'s which head (51) and (65).¹⁸ By adopting (65) for the examples (60)–(61), we could analyze coordination in the same way as PG constructions.

4.4. How to Capture the CSC Effect

In distinguishing two *and*'s, we are in a position to answer another potential question: why is it that the coordinator *and* in the structure (51) requires there to be ATB extraction from both conjuncts while the subordinator *and* in (65) does not? Leaving the details for future study, I just note a possible solution here. As suggested by Chomsky (1993, 1995) and Chomsky and Lasnik (1993), let us assume that the parallelism requirement holds at PF (as well as at LF), and is stated as

¹⁸ Another counterexample to the CSC is given by Ross (1967):

(i) Here's the whisky which_i I [went to the store] and [bought t_i].

In (i), different from Goldsmith's example, extraction is from the right conjunct. It is well-known that the example such as (i) implies the temporal order of the two events denoted by the two conjuncts. According to Déchaine (1993) and Williams (1990), such examples do not allow extraction from the left conjunct:

(ii) ??Which store_i did you [go to t_i] and [buy some whisky]?

It might be possible to posit the third type of *and* and assign it a different structure, but I do not pursue this idea here.

in (67):

- (67) The second conjunct [must] be interpreted in the same way as the first. (Chomsky and Lasnik (1993: 564))

For (67) to apply to the structure (51) but not to (65), only the coordinator *and* marks its conjuncts as *subject to* (67) as soon as the operation Merge applies (cf. Chomsky (1995: 252)). Interpreting (67) in a broad sense, we suggest that (67) requires the PF rule that applies to the first conjunct to also apply to the second. Consider a CSC violation example like (68):

- (68) *what* does [_{&P} [_{TP} John like beer] and [_{TP} Tom hate (*what*)]]

In (68), the *wh*-phrase is extracted only from the right conjunct and its copy stays in situ. Under the recoverability condition of deletion, one of the phonetically duplicated objects will be deleted at PF. To be specific, suppose that given a chain (α_i , α_{i+1}), the recoverability condition requires the head α_i to delete the phonetic content of the tail α_{i+1} . Thus, deletion of the *wh*-copy in (68) results in (69):

- (69) *what* does [_{&P} [_{TP} John like beer] and [_{TP} Tom hate (_)]]

According to (67), deletion of a *wh*-copy is required to take place in the left conjunct just as in the right conjunct. However, there is no *wh*-copy to delete in the left conjunct in (68), so deletion cannot apply. As a result, the parallelism requirement in (67) will be violated, and the CSC effect will arise. Note that (67) is irrelevant to subordination. This implies that the occurrence of PGs is optional in nature. Alternatively, the CSC effect might be reduced to parallel interpretation at LF (cf. Goodall (1987)). Needless to say, further research is needed.

5. Conclusion

I have argued that PG constructions as well as coordinate constructions involve ATB movement, which is triggered by a feature in the same target. I have shown that if the ATB movement analysis is adopted, the MLC, a condition on Attract/Move, can offer a more principled account of the distribution of PGs and the nature of ATB movement in both coordinate and PG constructions. That is, the MLC predicts that ATB movement is possible if and only if two (or more) candidates are not in a c-command relation with each other and are equally close to the target. If PG constructions are assumed to involve ATB movement, the anti-c-command condition on the PG is naturally understood as the consequence of ATB movement, to which

the MLC only vacuously applies. This reduction is welcome in the Minimalist Program as far as the MLC is a primitive condition built into the computational system of UG. Although I did not discuss A- and X⁰-ATB movement, they are also likely to be amenable to the present account.

On the other hand, I have also argued that the notion of barrier still plays an important role in the Minimalist Program in determining whether the copies of movement can construct a chain as a legitimate object at LF. The reconstruction effects observed in PG constructions and coordinate constructions can be explained by virtue of barriers. Some cases of reconstruction effects are apparently problematic to the ATB movement analysis, but they actually strengthen it, manifesting the intervention of a barrier between the copies of movement.¹⁹

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¹⁹ One might wonder, as an *EL* reviewer does, whether the notion barrier is compatible with the Minimalist Program. What I can say now is that the Minimalist Program as such is not ready to answer this question. As far as I am aware, it is not yet equipped with any definite machinery to explicate the phenomena, except for those like *wh*-island, which barriers have been responsible for (see footnote 8). However, barriers can be defined in Minimalist terms (*domain*) rather than pre-Minimalist terms like *government*. Moreover, as has been mentioned in section 3.2, I assume that barrierhood is an inherent property of lexical items, rather than a relational property between categories in phrase structures, which is suppressed in a certain domain of a head. Thus, the notion of barrier might well be justified not only empirically but also theoretically within the Minimalist framework.

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