Literal Reconstruction: the Motivation and Characterization*

Eung-Cheon Hah

1. Introduction

There are cases where a displaced element behaves with respect to binding theory as though occupying some position lower than the one in which it actually appears. Consider the following.

(1) Which pictures of himself$_{i/j}$ does John$_i$ think t that Bill$_j$ likes t?

Assuming that *himself*, being an anaphor, must be c-commanded by its antecedent in order to be appropriately licensed,[1] we are led to conclude that the moved phrase containing the anaphor behaves as if it were in the intermediate or the base position with respect to binding.

This phenomenon is known as reconstruction in the literature. Among the possible approaches to this phenomenon are those that are usually referred to as "reconstruction" approaches. Hence, a terminological confusion may arise between "reconstruction" referring to the phenomenon and that referring to the operation. In this paper, however, the term 'reconstruction' refers to the

---

* This paper is based upon my doctoral dissertation (Hah (1998) *Reconstruction and Quantifier Scope in English*: Chapter 3).

1) Chomsky (1993) suggests "a very simple interpretive version of binding theory," as given below.

(i) BT(A): If α is an anaphor, interpret it as coreferential with a c-commanding phrase in the relevant local domain.

(ii) BT(B): If α is a pronominal, interpret it as disjoint from every c-commanding phrase in the relevant local domain.

(iii) BT(C): If α is an R-expression, interpret it as disjoint from every c-commanding phrase.

actual lowering operation, not the phenomenon itself, unless otherwise indicated.

Among the reconstruction approaches, the one suggested by Chomsky (1993) is called the Copying and Deletion analysis. It claims that elements in a Chain C = (α_1, ... , α_n) are token-identical or copies of each other.[2] This approach is the one that is best known in the recent literature.

Based on the data showing that the Copying and Deletion strategy faces some problems, this paper suggests that the approach that exploits literal lowering of the moved element[3] can be an alternative to the Copying and Deletion analysis. We will then proceed to claim that reconstruction should be more strongly constrained than has been assumed previously.

We assume the enriched IP structure of Pollock (1989) as elaborated by Chomsky (1991). But the phrase markers will indicate just enough detail to make the discussion clear.

2. The Copying and Deletion vs. the Literal Reconstruction

This section will begin by providing a brief critical survey of the Copying and Deletion analysis, along with its problems. We will see that those problems do not arise under the literal lowering approach.

2.1. The Copying and Deletion Analysis

Chomsky's (1993) Copying and Deletion strategy provides a simple account, for example, for the fact that in constructions like the following, *himself* can be anaphoric both to *John* and to *Bill*.

(2) John wondered which picture of himself Bill took.

The specific mechanism of the copy theory of movement in A'-chains involves

---

2) The copy contrasts with a trace in that the former "receives" Case, while the latter does not. See Fox (1997: fn. 54).

3) The question of exactly what part of the moved element lowers in A-chain and A'-chain is not discussed here.

"quasi QR" and a subsequent operation "complementary deletion," which results in an operator-variable construction. The operation of quasi QR may raise either the operator alone, leaving behind the restriction part in situ, as shown below in (3a), or the whole *wh*-phrase, as shown in (3b).

(3) John wondered [which picture of himself] Bill took [which picture of himself].

Quasi QR, then:

a. John wondered [which [t picture of himself]] Bill took [which [t picture of himself]].
b. John wondered [which picture of himself [t]] Bill took [which picture of himself [t]].

Following the operation of quasi QR, complementary deletion applies and yields the following structures in which deletion is marked with a broken line on the relevant part.

(4) a. John wondered [which ~~[t picture of himself]~~] Bill_j took ~~[which~~ [t picture of himself_j]].
b. John_i wondered [which picture of himself_i ~~[t]~~] Bill took ~~[which picture of himself~~ [t]].

As a consequence, the fact that (2) is ambiguous in terms of anaphor binding is correctly captured: (4a) represents the reading in which *himself* is bound by *Bill* while (4b) represents the reading where *himself* is bound by *John*.

Though Chomsky argues that reconstruction is "essentially a reflex of the formation of operator-variable constructions," there are many authors (e.g., Belletti and Rizzi (1988), Fox (1995, 1997), Hornstein (1995), Lebeaux (1994), Sohn (1996), Hah (1998), etc.) who assume that reconstruction is possible in A-chains as well. Assuming that reconstruction applies to A-chains, let us see how the copy theory of movement may deal with the following sentence (attributed to Lebeaux (1994)) in which *two women* can take both wide and narrow scope with respect to *every senator*, as the gloss shows.

(5) Two women$_i$ seem two women$_i$ to be expected two women$_i$ to dance with every senator.
($\exists > \forall$ = *The same two women seem to be expected to dance with every senator*; $\forall > \exists$ = *It seems to be expected that for every senator, there are two women — not necessarily the same two women — who will dance with him.*)

In this sentence, the Case-checking position disagrees with the position in which a quantifier is interpreted, since *two women* has its Nominative Case checked overtly in the Spec of the matrix AgrsP while its relative scope, in particular the narrow scope, with respect to *every senator* seems determined in another position at LF. Note that no such scopal ambiguity (as that observed in (5)) is reported in the case of *Two women seem to each other to be expected to dance with every senator*, certainly because *two women*, if it lowers, will not be able to c-command the anaphor *each other*. This implies that in (5) the narrow scope reading for the existential quantifier is attributed to the fact that it can be interpreted in a position lower than the Case-checking position. We are therefore led to conclude that in sentences like this, all the copies of *two women* are deleted except for the last one which must be filled at LF[4] on the assumption that the relative scope with respect to *every senator* is determined there. With regard to Case checking, the copy theory must therefore assume that when one copy has its Case checked off, all the copies are automatically Case-checked.[5]

2.2. Problems with the Copying and Deletion Analysis

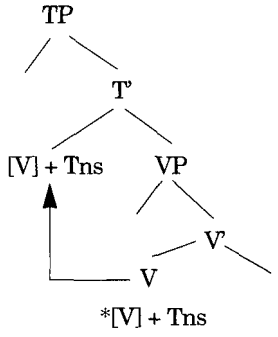
However, this line of reasoning seems to face some problems, which do not arise if we take the literal lowering approach instead. For example, Lebeaux (1994) argues against the assumption of copy theory according to which when one copy has its Case checked off, all the copies are automatically Case-

4) Let us assume with Hornstein (1995) that in an A-chain any link (actually, every copy but one) can delete while in an A'-chain deletion is subject to Chomsky's (1993) principle of Preference which says, "Try to minimize the restriction in the operator position."

5) Otherwise, the *two women* in the lowest position will have its Case unchecked.

checked. The argument is that such "homogeneity in operation" is, in general, not allowed in the literature. As shown by (6), the V-to-Tns movement does not involve the lower V's inheritance of the V + Tns node: When V adjoins to Tns for the purpose of having its tense checked, yielding a complex head V + Tns, the base position of V does not become the same complex head, as indicated by an asterisk on V + Tns in the tree below.

(6)



Nor is it the case that all traces are erased when one copy is erased. In (5), for example, the lowest copy must survive.

There is an additional problem for the Copying and Deletion approach. Lebeaux's (1988, 1994) distinction between an adjunct and a complement with respect to lexical insertion is generally accepted.[6] Then how can the asymmetry in constructions such as the following (Heycock (1995)) be accounted for within copy theory?

(7) a. Which stories about Diana$_i$ did she$_i$ most object to?
b. *How many stories about Diana$_i$ is she$_i$ likely to invent?

(8) a. Which lies aimed at exonerating Clifford$_i$ did he$_i$ expect to be effective?
b. *How many lies aimed at exonerating Clifford$_i$ is he$_i$ planning to come up with?

6) Regarding the complement/adjunct asymmetry, the readers are also referred to Freidin (1986).

According to Lebeaux, an adjunct can be inserted after *wh*-movement, while a complement must be present at "D-Structure." This complement/adjunct asymmetry will yield as equivalents of (7-8) the following structures which adopt the Copying and Deletion analysis.

(9) a. [Which stories [about $Diana_i$]] did she_i most object to [which stories]?
b. *[How many stories [about $Diana_i$]] is she_i likely to invent [how many stories]?

(10) a. [Which lies [aimed at exonerating $Clifford_i$]] did he_i expect [which lies] to be effective?
b. *[How many lies [aimed at exonerating $Clifford_i$]] is he_i planning to come up with [how many stories]?

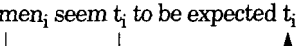
As the above structures show, the Copying and Deletion approach includes no copy of the adjunct (*about Diana* or *aimed at exonerating Clifford*) in the base position since the adjunct is inserted after *wh*-movement. It follows that even after deletion applies, the (b) sentences will not violate BT(C), turning out to be grammatical contrary to fact, as the R-expressions are outside of the c-domain of their coreferential pronoun.

These problems, however, are likely to be solved if we assume the literal lowering approach instead. The next section will show how such problems can be handled under this alternative approach.

2.3. The Literal Reconstruction Analysis Adopted

In the minimalist account, there is no requirement that traces be antecedent governed or bound. That is, the notion of government, which played a key role in GB theories (in particular, Case Theory, Theta Theory, Control Theory, and Binding Theory), is no longer needed. The minimalist theory instead depends upon feature checking through Spec-Head or Head-Head agreement. The actual lowering of a linguistic element may therefore be licensed, provided that it does not violate constraints such as shortest steps of movement, morphological feature checking, no unnecessary movement, and others.

As already mentioned, the Copying and Deletion analysis faces problems such as "homogeneity in operation" as well as empirical problems such as those noted in (7-8). In this section, I will argue that these problems do not arise under the literal lowering approach. Let us take the first problem, i.e., the all-at-once Case checking of copies. Recall that such homogeneity in operation is not generally assumed in the literature. The literal lowering approach allows us to think, following Lebeaux's (1994) suggestion, that for example, the existential quantifier in (5) lowers to the appropriate scopal position after it has its Case feature checked in an appropriate position, as shown below.[7)]

(11) Two women$_i$ seem t_i to be expected t_i to dance with every senator.

(LF)

More specifically, after having its Case feature checked in the surface position (i.e., Spec of the matrix AgrsP), the existential quantifier lowers to the base position in a successive cyclic manner and takes its narrow scope with respect to *every senator*. This means that under the literal lowering approach *two women* can be interpreted in the base position without inviting the problem of homogeneity in operation regarding Case checking.

As for the other problem, i.e., the asymmetry observed in (7-8), the insertion of an adjunct after *wh*-movement does not bleed BT(C) in the literal lowering approach, as long as we assume, following Heycock (1995), that non-referential expressions, unlike referential expressions, must be lowered to the base positions. In the (a) sentences, the moved phrases are referential and so not reconstructed unless forced. Note that there is no driving force which triggers their lowering. After all, there is no BT(C) effect in these examples. The (b) examples are analogous to the (a) examples in that there is no driving force which triggers the lowering of the displaced phrase. As we follow Heycock in assuming the obligatory reconstruction of non-referential expressions, however, the displaced phrases must be lowered in these sentences. Suppose that even though inserted after *wh*-movement, the adjunct

7) Note that (11), in contrast with (5), does not adopt the copy theory of movement.

can be pied-piped when reconstruction of the moved phrase takes place.[8] The sentences in question will then turn out to be BT(C) violations, as expected.

As the problems for the Copying and Deletion approach can be avoided without difficulty under the literal lowering approach, it may be concluded that the latter approach is a better alternative to the former approach. In the following section, I will address the characteristics of the literal reconstruction, claiming that reconstruction should apply *locally*, in addition to satisfying the conditions of Distinct Interpretability and BT-Compatability.

3. The Characterization of Reconstruction

In the course of our discussion, we have implicitly assumed that reconstruction is, in principle, possible to any trace position.[9] This is now stated explicitly in (12) below.

(12) Reconstruction is free.

That is to say, the operation can occur freely as long as it does not violate any principle of grammar. Despite its free nature, reconstruction in reality does not occur by creating new positions: It is restricted to trace positions. When viewed in terms of economy, the lowering operation involving creations of new positions is costlier than the operation that capitalizes on the existing trace positions.

3.1. Distinct Interpretability

If the lowering operation involves an extra or illegitimate step or link, the derivation that belongs to the same Reference Set, defined as in (13), and which does not have such an unwanted step prevails in accordance with the

8) The claim that the adjunct can be pied-piped is based on its character as a modifier. Intuitively, the adjunct and the expression modified by it must be kept as one non-split unit in the C-I interface.

9) The underlying assumption is that traces remain for the reconstruction of the relevant part of the moved element.

principle of economy.

(13) Reference Set (Fox (1995))
Let N be a set of lexical items, M a meaning of a clause, and D a structure at a point in the derivation. The *reference set* for N, M and D, $R_{N,M,D}$, is the set of possible transformations D' of D such that D' is derived from D using only elements from N, and that D' is further extendible to a converging derivation using the remaining elements of N and having M as the meaning of the minimal CP dominating D.

In other words, when there are two (or more) possible derivations (or competitors) with the same set of lexical items, and with the same meaning, at a certain derivational stage, the optimal derivation is the one that involves the least derivational cost.[10] This is a position we share with Fox (1995, 1997).

Let us take (14-15), for example.

(14) a. Mary loves everyone.
b. *[__ everyone$_j$ [$_{VP}$ Mary loves t_j]]. (LF)
(15) a. Someone seems to love Mary.
b. [__ seems [$_{AgrsP}$ Someone to love Mary]]. (LF)

Reconstruction of *Mary* across the universal quantifier in (14) would create an extra link that does not have any semantic effect. The resulting derivation is thus blocked by the one that belongs to the same RS and at the same time does not involve such an extra step. On the contrary, in (15) the existential quantifier yields a distinct interpretation when it is lowered across the verb *seem*. In this sentence the derivations with and without the lowering, therefore, belong to distinct RSs, *someone* being construed either in the surface

10) The discussion necessarily raises a question regarding the autonomy of syntax. But Fox (1995) claims that syntax is not completely autonomous, as implicit in his definition of the Reference Set. He says, the question is "how much of interpretation is syntax capable of seeing?" See Fox (1995: 287-289), for further discussion on this

position (i.e., *There is a person, e.g., John, who seems to love Mary*) or in the lowered position (i.e., *It seems that there is some person (or other) who loves Mary*). In a nutshell, Distinct Interpretability serves as an economy constraint on reconstruction.

However, we differ from Fox (1995, 1997) regarding the specifics of economy. Fox claims that scope shifting operations such as quantifier raising and quantifier lowering are restricted by economy considerations. Economy considerations choose the most optimal derivation from the RS, a set of competitors, and optimality is achieved by reducing instances of movement or by minimizing their length. Computation of the optimality in a disjunctive manner like this may allow reconstruction to skip over an intermediate trace position only if further lowering results in a distinct interpretation.

In case an intermediate trace position is ignored, however, the scope asymmetry in sentences such as the following cannot be predicted.

(16) a. I expected everyone$_i$ not to be t_i there yet. ($\forall$ > *neg*, *neg* > $\forall$)
b. Everyone$_i$ seems t_i' not to be t_i there yet. ($\forall$ > *neg*, **neg* > $\forall$)
(Chomsky (1995))

In (16a), reconstruction of *everyone* across *not* results in a distinct interpretation. The two derivations (one with *everyone* in its surface position and the other with *everyone* in the base position), therefore, are not competitors, each belonging to a different RS. The two denotations, a partial negation and a total negation, of this sentence are attributed to this fact.

Sentence (16b) contrasts with (16a) in that it does not involve ambiguity. On the part of Fox, the lack of ambiguity of (16b) cannot be accounted for. If the intermediate trace position is a target of reconstruction, economy considerations will choose the non-lowering option over the lowering option from the same RS. Note that no semantic effect results from the lowering. On the other hand, if the target shifts to the base position, the lowering option will not be blocked by the non-lowering one. This is because the two options now belong to distinct RSs. As long as the intermediate trace position is ignored, constructions such as (16b) will indeed be examples that argue against A-

reconstruction, i.e., reconstruction in A-chains.

3.2. Locality

Provided that reconstruction is subject to economy, as practically confirmed by authors such as May (1985) and Fox (1995), it seems natural to claim that economy should hold in reconstruction not only to the ultimate target position but also to an intermediate trace position. In this connection, I claim that reconstruction is local. Then, the lack of ambiguity in (16b) is expected, since (17a-b) with *everyone* lowered are illegitimate LF structures.

(17) Everyone$_i$ seems t_i' not to be t_i there yet. (=(14b))
  a. *[____ seems [Everyone$_i$ not to be t_i there yet]].
    (No Distinct Interpretation)
  b. *[____ seems [t_i' not to be Everyone$_i$ there yet]].
    (Locality violation)

Importantly, the universal quantifier does not reconstruct across a raising predicate *seem* to the subject position of the infinitival clause, as (17b) shows. This is so because whether or not it lowers over *seem*, the truth conditions of the sentence seem to be identical. (Notice, however, that the lowering of *everyone* over negation is not semantically vacuous.) In other words, no distinct interpretation is likely to arise between *everyone* > *seem* (e.g., *Everyone seems to love John*) and *seem* > *everyone* (e.g., *It seems that everyone loves John*), which is why the non-lowering option is chosen instead of the lowering one. Given that reconstruction is local, the lowering of *everyone* across *not* to the specifier position of the lower VP is impossible, as shown by (17b). The only interpretation available for (17) is the reading with the universal quantifier taking scope over negation.

However, there may be some cases where reconstruction occurs although no semantic effect is gained from it. Take (18), for example.

(18) a. What worries everyone?
  b. [$_{CP}$ What$_i$ [$_{C'}$ [$_{AgrsP}$ t_i [$_{TP}$ [$_{AgroP}$ everyone$_j$ [$_{VP}$ [$_{V'}$ worries t_i] t_j]]]]]] (LF)

($\exists > \forall$ = *There is a certain thing X, such that X worries everyone. What is X?*; $\forall > \exists$ = *For everyone, there is a (different) thing X, such that X worries him. What is X?*)

Suppose the existential quantifier *what* must lower to the base position below *everyone*$_j$ in order for it to have narrow scope.[11] Now that it cannot skip over the intermediate trace, we need an assumption like (19) in order to accommodate examples such as this.

(19) String vacuous reconstruction is costless.[12]

Here, the term "string vacuous reconstruction" might be misleading. Therefore, we need to define, though theory-internally, the term "string vacuous reconstruction" as follows: lowering of α is string vacuous if it does not cross any "scope-bearing" predicate[13] or any positions associated with a quantifier. Notice that discussions on reconstruction in the literature (e.g., May (1985), Fox (1995, 1997)) have been concerned with whether a semantic effect is brought about when an element reconstructs across a scope-bearing element. In other words, for this operation to apply, it must reverse the relative scope of two non-commutative scope-bearing elements.[14] Then it may

11) In Hah (1998), I assumed that *wh*-words consist of *WH* plus anaphoric *SOME* and that what reconstructs is just the anaphoric part. However, in this paper I will set the question aside for the sake of convenience.

12) The employment of the phrase "vacuous reconstruction" is by analogy with Ross's (1986: 111) term "vacuous extraposition," which refers to the extraposition with no reordering of elements. In addition, the reason we add the word "string" is that the kind of reconstruction in question must be distinguished from semantically vacuous reconstruction.

13) Raising predicates, for example, are referred to as "scope-bearing" predicates in that they participate in scope interactions with quantifiers.

14) The term "non-commutative" can be understood with reference to the definition of "commutative." We say α and β, are commutative iff the order of the two elements does not affect the result, as, in addition, $3 + 2 = 2 + 3$ and, in multiplication, $2 \times 3 = 3 \times 2$. It can therefore be said that two quantificational elements, for example, are commutative if their relative scope is of no interest to semantic interpretation, i.e., if the interpretation is identical under the two scopal relationships.

be argued that there is virtually no "cost" in assuming that string vacuous reconstruction is costless.

3.3. BT-Compatibility

In addition to observing Distinct Interpretability and Locality, reconstruction must feed binding theory including quantificational binding (Fox (1997), Lebeaux (1994), among others). Consider the following sentence.

(20) [His$_i$ mother's$_j$ bread] seems to every man$_i$ t_k to be known by her$_j$ to be the best there is.
  a. __ seems to every man$_i$ [his$_i$ mother's$_j$ bread] to be known by her$_j$ to be the best there is. (LF)
  b. *__ seems to every man$_i$ t_k to be known by her$_j$ [his$_i$ mother's$_j$ bread] to be the best there is. (LF)

As a (pronominal) variable must be licensed at LF, reconstruction of the subject in (20) is needed to a position c-commanded by *everyone*. Suppose that it is lowered to the base position as in (20b), a configuration will then be created in which BT(C) is violated. On the contrary, if reconstruction takes place only to the intermediate site, both variable binding and BT(C) are satisfied at the same time.

That reconstruction feeds binding theory is also shown by the scope asymmetry observed in (21-22) from Hornstein (1995).

(21) a. Someone played every piece of music you know.
  b. [$_{AgrsP}$ Someone$_i$ [$_{TP}$ [$_{AgroP}$ [every piece of music you know]$_j$ [$_{VP}$ t_i played t_j]]]] (LF)
  ($\exists > \forall$ = *The same one man played every piece of music you know*; $\forall > \exists$ = *For every piece of music you know, there is a (different) person who played it.*)

(22) a. Someone^k played every piece of music he^k knows.
  b. [$_{AgrsP}$ Someone$_i^k$ [$_{TP}$ [$_{AgroP}$ [every piece of music he^k knows]$_j$ [$_{VP}$ t_i played t_j]]]] (LF)
  ($\exists > \forall$ = *The same one man played every piece of music he*

knows; * $\forall > \exists$)

Importantly, the lowering of *someone* over another quantifier *everyone* brings about a distinct interpretation. The difference in scope interactions will then follow from the fact that (22), but not (21), contains a coreferential pronominal variable *he*. In (21), the existential quantifier can lower, which is presumably responsible for its narrow scope reading. In the case of (22), however, such lowering is not possible; if *someone* is reconstructed to the base position, it will fail to bind the pronominal variable *he*.

One might argue that even if the existential were reconstructed, variable binding would be satisfied since the direct object might subsequently lower to its trace position. Notice however that a pronominal must be free throughout the derivation. Take, for example, (23a) attributed to Lebeaux (1994).

(23) a. *He_i^j seems to him^j t_i to be expected t_i to win.
b. It seems to him that it is expected that he will win.

As implied by the grammaticality of (23b), the sentence would be acceptable if he_i appeared in the base position. In order to capture the ungrammaticality of (23a), it seems, therefore, necessary to assume that a pronominal must always be free.

4. Summary and Conclusion

In this paper I have shown that the Copying and Deletion analysis, as it stands, faces problems. For example, with respect to Case-checking, the approach assumes "homogeneity in operation," which is, in general, not allowed in the literature. And the assumption of complement/adjunct dichotomy with regard to the point in time of lexical insertion poses the approach with empirical problems. As suggested in the course of the discussion, however, such problems may not arise under the literal lowering approach.

After pointing out that the literal lowering analysis could be an alternative

to the Copying and Deletion approach, I made inquiries into what characteristics reconstruction may have. It has been already known that reconstruction is subject to Distinct Interpretability and feeds binding theory. I have found, however, that reconstruction needs to be more strongly constrained than previously assumed in the literature. Namely, reconstruction not only is subject to Distinct Interpretability and feeds binding theory, but must be local (Hah (1998)). A consequence is that we get support for the reconstruction in A-chains.

Further work is yet to be done, however. For example, it seems that the obligatory A'-reconstruction of a predicate or a non-referential expression does not follow from Distinct Interpretability which is regarded as a factor licensing reconstruction. The working factor in this case appears to be a certain property of such an expression, say, a property that a non-referential expression must be interpreted in the base position. We will have to see if this is indeed the case. In addition, I demonstrated on empirical grounds that reconstruction should be local. But this supposition needs additional empirical support.

References

Belletti, A. and L. Rizzi (1988) "Psych-verbs and θ-theory," *Natural Language & Linguistic Theory* 6: 291-352.

Chomsky, N. (1991) "Some Notes on Economy of Derivation and Representation," in R. Freidin (ed.) *Principles and Parameters in Comparative Grammar*, MIT Press, Cambridge, Massachusetts.

_____ (1993) "A Minimalist Program for Linguistic Theory," In K. Hale and S.J. Keyser (ed.) *The View from Building 20*, MIT Press, Cambridge, Massachusetts.

Fox, D. (1995) "Economy and Scope," *Natural Language Semantics* 3: 283-341, Kluwer Academic Publishers.

_____ (1997) "Reconstruction, Binding Theory, and the Interpretation of Chains," ms., MIT, Cambridge, Massachusetts.

Freidin, R. (1986) "Fundamental Issues in the Theory of Binding," in Barbara

Lust (ed.) *Studies in the Acquisition of Anaphora*, Dordrecht: Reidel.

Hah, E.-C. (1998) *Reconstruction and Quantifier Scope in English*, doctoral dissertation, Seoul National University.

Heycock, C. (1995) "Asymmetries in Reconstruction," *Linguistic Inquiry* 26: 547-570.

Hornstein, N. (1995) *Logical Form: From GB to Minimalism*, Blackwell.

Lebeaux, D. (1988) *Language Acquisition and the Form of the Grammar*, doctoral dissertation, University of Massachusetts, Amherst.

_____ (1994) "Where does the Binding Theory Apply?" ms., University of Maryland, College Park.

May, R. (1977) *The Grammar of Quantification*, doctoral dissertation, MIT, Cambridge, Massachusetts.

_____ (1985) *Logical Form*, MIT Press, Cambridge, Massachusetts.

Pollock, J-Y. (1989) "Verb Movement, Universal Grammar and the Structure of IP," *Linguistic Inquiry* 20: 365-424.

Ross, J.R. (1986) *Infinite Syntax*, Ablex Publishing Corporation, Norwood, New Jersey.

Sohn, K.-W. (1996) *Negative Polarity Items, Scope, and Economy*, doctoral dissertation, UCONN.