0. INTRODUCTION. Chomsky 1981 introduces the Empty Category Principle (henceforth ECP), providing a unified account of the asymmetry of subjects and objects with respect to extraction in syntax and LF. The major examples are so-called "that-trace" phenomena and multiple *wh*-questions as shown in 1 and 2:

(1) a. *Who did you say that t saw John?  
   b. Who did you say that John saw t?

(2) a. *Who remembers where who bought the book?  
   b. Who remembers where John bought what?

Chomsky explains the grammaticality of 1 and 2 in the following way: at the LF-representations of *b*-sentences in 1 and 2, the object traces are properly governed by the verbs while at the LF-representations of *a*-sentences, the subject traces are not properly governed by the verbs or by

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their antecedents. Thus the ECP—the requirement that a nonpronoun-
nal empty category must be properly governed by an X⁰ category or the
antecedent—can correctly predict the grammaticality of 1 and 2. Further-
more, Huang 1982 makes a crucial contribution to the Government-Bind-
ing (GB) Theory in that his proposals enable us to account for a much
wider range of the distribution of empty categories. He suggests that
‘well-known subject/object asymmetries should be seen as a special case
of a more general complement/non-complement asymmetry (p. 524).’

Let us consider the following sentences:

(3) a. ??\textit{What} did you wonder why John bought \textit{tj} \textit{ti}?
b. *\textit{Who} did you wonder why \textit{ti} came \textit{tj}?c. *\textit{Why} did you wonder what John bought \textit{ti} \textit{tj}?

(4) a. Tell me where you bought \textit{what}. b. *Tell me where \textit{who} bought the book.
c. *Tell me where you bought the book \textit{why}.

In 3, \textit{wh}-phrases are extracted from \textit{wh}-islands by syntactic \textit{wh}-move-
ment. Similarly, a \textit{wh}-phrase in-situ in 4 is moved into the Pre-IP posi-
tion to take a scope by LF \textit{wh}-movement. In both 3 and 4, the extracted
\textit{what} is a complement of the verb \textit{bought}, while \textit{who} and \textit{why} are not.
Thus the difference in grammaticality of 3 and 4 is related to the asym-
metry of complement and non-complement, rather than to that of sub-
ject and object.

However, the problem of their analyses is that in its subordinate defini-
tion, the ECP includes a curious disjunctive condition—the condition
that an empty category must be properly governed by X⁰ category or the
antecedent. Since these two kinds of government are of quite different
character, many linguists are tempted to inquire whether they can be
reduced to a single condition. Among them is Chomsky himself, who
recently proposes that the ECP is a condition on chain links in which
empty categories must be antecedent-governed. Although the ECP is
simplified in its definition as well as in its application,² there remain
problems unresolved by this revised ECP. In this paper, thus, I will
discuss the problems and make a proposal to solve them.

The paper is organized as follows. First, I will argue about the proper
governors which have been proposed in the literature. Section 2 deals
with antecedent government, summarizing Chomsky’s 1987 analysis.

² See section 2 for a detailed discussion.
Section 3 examines properties of multiple *wh*-questions and points out that some of the properties cannot be accounted for by the revised ECP. Section 4 is a proposal to explain them. Section 5 is a summary.

1. PROPER GOVERNORS. As mentioned above, the ECP includes disjunctively two conditions quite dissimilar in character. Examining the concepts of proper governor which have been proposed in the literature, we can classify them into four kinds of governor:

   \[
   \text{(5) Type 1. } \theta\text{-governor}
   \]
   \[
   \text{Type 2. case-assigner}
   \]
   \[
   \text{Type 3. } X^0 \text{ category}
   \]
   \[
   \text{Type 4. antecedent governor}
   \]

Type 1 is proposed by Stowell 1981, in which he attempts to unify the two different concepts of proper governor used in Chomsky 1981 by referring to a relationship of \( \theta \)-government between a verb and its complement. Chomsky 1986 also adopts the concept of \( \theta \)-government in a disjunctive condition of the ECP. Type 2 is suggested in Lasnik & Saito 1984. Type 3 is a proper governor in the definition of proper government proposed in Chomsky 1981, and Lasnik & Saito 1987 extends this idea and tries to solve the problems about proper government by assuming that both lexical governors and antecedent governors must be \( X^0 \) categories. And Type 4, in which a proper governor is an NP coindexed with a trace, is a disjunct of the ECP introduced in Chomsky 1981, but Chomsky 1987 claims that the antecedent governor should be regarded as the only proper governor correlated with the ECP. In this section, I will consider types 1, 2, and 3. Type 4 will be dealt with in section 2.

1.1. \( \theta \)-GOVERNOR OR \( \theta \)-GOVERNMENT. Asking why the definition of proper government should involve the disjunction of lexical government and antecedent government, Stowell 1981 suggests that lexical government would be a subcase of antecedent government if strict subcategorization entails co-indexing between a verb and its complement and if the strict subcategorization is limited in such a way that a lexical head may only subcategorize for complements to which it assigns thematic roles. That is, he considers that a verb antecedent-governs its complement by sharing a referential index (e.g. a thematic role) with the complement. On the other hand, Chomsky 1986 claims that empty categories must be \( \theta \)-governed or antecedent-governed. However, \( \theta \)-government or \( \theta \)-governor is not a sufficient concept in the definition of proper
government. To see this, let us consider the following sentences:

(6) a. Who\textsubscript{j} expects who\textsubscript{j} to be a winner?
    b. Who\textsubscript{i} suspects who\textsubscript{j} to be a spy?

In 6, who\textsubscript{j} will be moved into the matrix pre-IP position by LF-movement to take a scope, so that its trace would not be antecedent-governed in the same way as the trace of who in 7:

(7) a. *What did who see?
    b. *Why did who leave?

Thus, that sentence 6 is grammatical means that the trace of who\textsubscript{j} must be associated with θ-government or θ-governed. However, verbs like expect and suspect cannot θ-govern the trace. It follows therefore that even if an empty category is not θ-governed, sentences like 6 are grammatical. Moreover, the trace of John in 8 is θ-governed by the verb told, but this sentence is ungrammatical.

(8) *John seems that it was told \textit{t} that Mary came.

Thus, this shows that θ-government or θ-governor is not a sufficient concept of proper governor to guarantee the occurrence of empty categories.

1.2. CASE ASSIGNED. Lasnik & Saito 1984 argue that lexical government obtains only when there exists a relationship of θ-assignment or Case-assignment between a governor and its governee. It is certain that the contrast in grammaticality between 9a and 9b below can be correctly predicted by the requirement that empty categories must be Case-assigned.

(9) a. Who did they wonder whether to consider [S to be \textit{intelligent}].
    b. *John seems that it is considered [S to be \textit{intelligent}].

But sentences such as 10 would pose a new problem. That is, as mentioned in Chomsky (1986: 22) it would be requisite to ensure that in 10, want does not assign any Case to t' in the embedded COMP even if want can govern and case-mark t', since sentence 10 is not grammatical.

(10) *How did Bill wonder who wanted [S' t' [S to fix the car t]]? Thus, if Case-assignment is included in the definition of proper government, a problem arises as to Case-marking. So Chomsky 1986 rejects the addition of Case-marking to the definition of proper government.

1.3. X\textsuperscript{0} CATEGORY. Lasnik & Saito 1987 propose a general hypothesis such as 11 to unify two dissimilar conditions of the ECP; they assume that proper governors must be X\textsuperscript{0} categories in both lexical government and
antecedent government.

(11) Only $X^0$ categories can be proper governors.

Let us consider 12 and 13:

(12) a. *John, you think that $t$ left.
    b. Who do you believe that Mary said $t$ left early?

(13) a. *Who$_i$ $t_i$ thinks that who$_j$ left?
    b. *Who$_i$ $t_i$ wonders whether who$_j$ left?

Under their analysis, 12 and 13 would have 14 and 15 respectively as the S-structures and the LF-representations:

(14) a. \[S \text{John} \, [S \text{you think} \, [S \text{that} \, [S \text{t} \, [S \text{t left}]אסי]]]]
    b. \[S \text{who} \, [S \text{do you believe} \, [S \text{that} \, [S \text{Mary said} \, [S \text{COMP t'} \, [S \text{t left early}]אסי]]]]

(15) a. ... [S' [COMP that] [S INFL$_j$ [S $t_j$ left]]]
    b. ... [S' [COMP whether] [S INFL$_j$ [S $t_j$ left]]]

In 14, one obvious difference between (a) and (b) is found in the position of the intermediate trace. It is adjoined to $S$ in 14a, whereas in 14b it is in COMP. Hence, by assuming that COMP (= $X^0$ category), but not an intermediate trace, is qualified to be an antecedent governor, they account for the contrast in 14a and 14b. On the other hand, 15 is derived from 13 by adjunction of INFL to $S$ at LF. As INFL is an $X^0$ category, it is eligible for the antecedent governor of the subject trace $t_j$. It follows, then, that the ECP predicts 13 to be grammatical.

The hypothesis 11 and the INFL movement analysis presented above correctly account for the asymmetry of subject movement in syntax and LF, but at the same time they have a curious consequence. Let us consider 16:

(16) a. Who$_i$ bought what$_j$?
    b. *What$_i$ did who$_i$ buy?

According to their analysis, 16 has the following LF representations:

(17) a. \[S' \, [COMP what$_j$ \, [COMP who$_i$]] \, [S INFL$_i$ \, [S $t_i$ bought $t_j$]]
    b. \[S' \, [COMP who$_i$ \, [COMP what$_j$]] \, [S INFL$_i$ \, [S $t_i$ bought $t_j$]]

Under an analysis without INFL movement, 16b could be excluded by the ECP because at its presumed LF-representation, the trace of who$_i$ would be neither lexically governed nor antecedent-governed. However, given the INFL movement hypothesis, the trace $t_i$ of its LF-representation 17b is properly governed by the raised INFL$_i$ which is an $X^0$ category. Hence, 17b is not an ECP violation, in the same way as 17a. Thus, the contrast in 16 cannot be accounted for by their analysis. To avoid such a weakness, they propose a condition such as 18, which I
will call the Absorption Condition (AC):

(18) a. A WH-phrase X in COMP is 0-disjoint (Operator-disjoint) from a WH-phrase Y if the assignment of the index of X to Y results in the local A'-binding of Y by X. (S-structure)

b. If two WH-phrases X and Y are 0-disjoint, then they cannot undergo absorption.

Let us consider (16) again, whose S-structure is shown below in (19):

(19) a. \([S \, \text{who}_i \, [S \, \text{t}_i \, \text{bought \, what}_j]]\]

b. \([S \, \text{what}_j \, [S \, \text{who}_i \, \text{bought \, t}_j]]\]

(18a) will apply to (19b) and the assignment of the index of what to who will result in the A'-binding of who by what, marking both wh-phrases 0-disjoint. Then, even if who moves into the COMP, absorption will not take place. On the other hand, the application of (18a) to (19a) will not mark who and what 0-disjoint, since the intervening trace t will not A'-bind what but will A-bind it. Thus, who and what in (19a) will undergo absorption.

One of the advantages of their AC is that it can account for pure superiority effects as shown in (20), which are left unexplained by the original ECP.

(20) a. Who did you tell t to read what?

b. ?*What did you tell who to read t?

In (20b), who will move in the COMP position at LF and its trace will be properly governed by tell. Thus, the ECP cannot exclude (20b). However, if (18a) applies to (20b), what and who are marked 0-disjoint. According to (18b), then, these wh-phrases cannot undergo absorption and thus (20b) could have no appropriate interpretation.

Lasnik & Saito's analysis with the hypothesis (11) and the AC (18) is most intriguing, but is not without its own conceptual and empirical problems. A conceptual problem is one that is concerned with syntactic movement. As shown in (14b), a WH-phrase, which is a maximal projection, must be moved into COMP (=X^0 category) under their analysis, since they assume that only X^0 category can function as a proper governor. Note that this movement is grouped into a substitution, but not into an adjunction. If substitution, as Chomsky (1986) assumes, must be subject to Emonds' Structure-Preserving Hypothesis, which states that the bar-level of a landing site is the same as that of a substituted category, substitution of a maximal projection into an X^0 category like COMP should not be allowed. In other words, Chomsky (1986: 4) points out general properties of substitution in the following way:
(21) General properties of Substitution:
   a. There is no movement to complement position.
   b. Only $X^0$ can move to the head position.
   c. Only a maximal projection can move to the specifier
      position.
   d. Only minimal and maximal projection ($X^0$ and $X''$) are
      "visible" for the rule Move $A$.

If 21b and 21c are correct properties of substitution, a maximal projection
cannot move into a head position. Indeed, we have some evidence that
preposed wh-phrases occupy a Pre-COMP position (i.e. the specifier
position in the framework of Chomsky 1987), but not COMP itself.

(22) a. They stoden for to see who that ther com. (Chaucer)
    b. Jeg forfalte Jan hvem som var kommet. (Norwegian)
       I asked Jan who that had come
       'I asked Jan who had come'
    c. Cén bhean a phósfadh sé? (Irish)
       which man that would-marry he?
       'Which woman would he marry?'
    d. Ik weten niet wien dat Jan gezeen heet. (Flemish)
       I know not whom that John seen has
       'I don't know who John has seen.'

They could claim that if the head position of COMP is not occupied,
then a maximal projection could move into that position. However, it
seems to be a very ad hoc proposal. Rather, the more natural expla-
nation would be to suppose that a preposed wh-phrase moves to the
specifier position regardless of what kind of element occupies the
COMP position. If this line of argument is correct, the grammatical
contrast in 12, whose S-structure is repeated in 23, cannot be accounted
for by their analysis, since the intermediate trace $t'$ in 23a cannot be
an $X^0$ category nor function as a proper governor, in the same way as
the intermediate trace $t'$ in 23b.

(23) a. $[s, \text{who } [s \text{ do you believe } [s \text{ that } [s \text{ Mary said } [s, t' [s t [left]]]]]]]
    b. $^{*[s, \text{ John } [s \text{ I think } [s, \text{ that } [s, t' [s t [left]]]]]]}$

On the other hand, Lasnik & Saito's analysis runs into empirical
problems concerning how to apply the ECP and the AC to multiple wh-
questions. Are multiple wh-questions subject either to the ECP or the
AC, or to both? Let us consider the following sentences:

(24) a. ?Who$_i$ said that who$_j$ won the election?
b. ?Who\textsubscript{j} whispered that who\textsubscript{j} understood this paper?

Under the INFL-raising proposal, 24 is not an ECP violation, since at the supposed LF-representations of 24a and 24b, the trace of who\textsubscript{j} would be properly governed by the adjoined INFL\textsubscript{j} to the embedded sentence in the same way as in 15a. This analysis predicts that 25 below should be grammatical, but it is a false prediction.

(25) a. *How\textsubscript{i} did you think that who\textsubscript{j} solved the problem ti?
b. *Why\textsubscript{i} did you say that who\textsubscript{j} bought the book ti?

Thus, they must explain the ungrammaticality of 25 by the AC; the assignment of the index of how or why to who results in the A’-binding of who by how or why, so that the AC marks how or why 0-disjoint from who and thus shows that the two wh-phrases cannot undergo absorption.

However, the AC itself has a few problems. First, the AC cannot account for the well-known fact that sentences like 26 are ambiguous between multiple direct and indirect questions.

(26) a. Who remembers where Bill saw what?
b. Who remembers when Bill bought what?

In 26a, for instance, the assignment of the index of where to what results in the A’-binding of what by where. Thus where and what are marked 0-disjoint and cannot undergo absorption. It follows, therefore, that 26a cannot be interpreted with multiple indirect questions, although it is not in violation of the ECP. The same is true of 26b. A second problem with the AC is concerned with sentences like 27.

(27) a. ?Why did you buy what?
b. Tell me why you bought what?

In 27, if the index of why is assigned to what, why A’-binds what. Consequently, these wh-phrases are marked 0-disjoint from each other and thus the AC shows that the two wh-phrases why and what in 27 cannot undergo absorption, and that 27 cannot be interpreted properly. Accordingly, the AC cannot account for the grammaticality of sentences like 27. Moreover, the AC incorrectly predicts the following sentences to be grammatical.

(28) a. *Who\textsubscript{i} ti said that John left why?
b. *Who\textsubscript{i} ti left before fixing the car why?

In 28, who and why can undergo absorption, since the trace ti of who\textsubscript{i} does not A’-bind why if why is coindexed with who in terms of 18a. Thus, the AC is satisfied with 28, although 28 is in violation of the ECP.

Summarizing the arguments described above, we have the following
Thus, to account for the data of multiple *wh*-questions, it seems very difficult to decide which of the ECP and the AC we should apply to them.

2. Antecedent Government. Chomsky 1987 removes the concept of *θ*-government from the definition of the ECP, and defines the ECP in terms of only the concept of antecedent government. Furthermore, he regards the ECP as a principle of chain links, but not as a principle of empty categories. The links are formed between elements associated with agreement as well as between a trace and its antecedent. The ECP is stated in the following terms:

(30) ECP: Chain links must satisfy antecedent-government.

Chomsky says that when an element satisfies the ECP, it is ǂ-marked and ǂ-checked. With regard to the ǂ-marking and ǂ-checking, then, assumptions below are set up:

(31) a. Anything can be ǂ-marked anywhere.

b. Anything can be checked for ECP anywhere.

31 suggests that at some level of the derivation of a structure, ǂ-marking and ǂ-checking apply to an element of the structure, whether it is an argument or an adjunct. The point here is whether intermediate traces of some elements are both ǂ-marked and ǂ-checked, although the initial traces are obviously subject to the marking and checking of ǂ. To know this, we must consider the Licensing Theory, which states that every element that appears in a well-formed structure must be licensed in one of a small number of available ways. Regarding operators and arguments, for example, one of the licensing options will include the following:

(32) Licensing Theory:

a. Operators are licensed by being in A'-position and by binding a variable.

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3 IQ means Indirect Question.
b. Arguments are licensed by \( \theta \)-marking (or Case-marking). Therefore, in the structure of operator-variable \((\alpha_1, \alpha_2)\), where \( \alpha_1 \) \( A' \)-binds \( \alpha_2 \) and \( \alpha_2 \) is \( \theta \)-marked, their intermediate traces are not required and if they exist in the structure, they must be deleted by the last resort principle since they are never licensed. On the other hand, the movement of an adjunct creates a structure such as \((\alpha_1, \ldots, \alpha_i, \ldots, \alpha_n)\) in which \( \alpha_i \) is in \( A' \)-position and \( \alpha_n \) is licensed by its chain links, so that adjunct traces are never deleted.

Keeping in mind the ECP which is more simplified not only in its definition but also in application, let us consider how the ECP explains instances like 33:

(33) a. I asked who bought what.
   b. *I asked who left why.

Under the analysis of Chomsky 1987, 33 would have 34 as its S-structure:

(34) a. I asked \([_{CP \ who_i } \ [_{IP \ ti} \ bought \ what]]\).
   b. I asked \([_{CP \ who_i } \ [_{IP \ ti} \ left \ why]]\).

Here, we will define Antecedent Government in the following way:

(35) Antecedent Government:
   \( \alpha \) antecedent-governs \( \beta \) if
   (i) \( \alpha \) and \( \beta \) are coindexed
   (ii) \( \alpha \) c-commands \( \beta \)
   (iii) there are no barriers between \( \alpha \) and \( \beta \).

In 34, \( \alpha_i \) c-commands the trace \( t_i \) and no barrier intervenes between them. 4 Thus, according to 35, \( t_i \) is antecedent-governed by \( \alpha_i \) and is thus \( \gamma \)-marked. Then, the LF-movement rule applies to 34, deriving a LF-representation like 37, but not like 36:

(36) a. \( \ldots \ [_{CP \ NP \ what_j } \ [_{NP \ who_i } ] \ [_{IP \ ti} \ [_{VP \ bought \ t_j } ] ] ] \)
   b. \( \ldots \ [_{CP \ NP \ why_j } \ [_{NP \ who_i } ] \ [_{IP \ ti} \ [_{VP \ left \ t_j } ] ] ] \)

(37) a. \( \ldots \ [_{CP \ who_i } \ [_{IP \ ti} \ [_{VP \ what_j } \ [_{VP \ bought \ t_j } ] ] ] ] \)
   b. \( \ldots \ [_{CP \ who_i } \ [_{IP \ ti} \ [_{VP \ why_j } \ [_{VP \ left \ t_j } ] ] ] ] \)

The reason why 37 is a correct LF-representation of 35 is that if a \( wh \)-phrase directly moves to the embedded pre-IP position as shown in 36, the preposed \( wh \)-phrase cannot antecedent-govern the trace, since there exists a barrier (i.e. VP) between them. In 37, however, the movement of \( what_j \) and \( why_j \) to the position adjoined to VP does not

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4 IP is assumed not to be a barrier. If IP is a barrier, a \( wh \)-phrase may be adjoined to IP.
cross the category VP, though it does cross one segment of VP. Thus, in accordance with 35, the wh-phrases antecedent-govern the respective traces, which are in turn γ-marked by 31a. Furthermore, the wh-phrases adjoin to who in the specifier position of the embedded clause. But their traces are neither antecedent-governed nor γ-marked since they are not c-commanded by the antecedents because of the existence of the wh-phrase who preposed by syntactic wh-movement.\(^5\) As mentioned above, furthermore, the intermediate trace of an argument can be deleted, whereas that of an adjunct cannot. Thus, the intermediate trace of what\(_j\) is deleted but the trace of why\(_j\) is neither deleted nor γ-marked. Therefore, the ECP excludes 37b, but not 37a.

Finally, we will consider what results are produced under an analysis with Chomsky’s new version of the ECP and 35. The former has two consequences; one is that the stipulation about a trace can be stated more generally as in 38, and the other that Lasnik & Saito’s principle 39 is not required:

(38) A wh-phrase leaves behind a trace optionally.

(39) Only an argument receives a γ-feature at S-structure.

38 follows from the licensing theory. That is to say, as an element has only to be licensed in a well-formed structure, it is not necessary to stipulate that a wh-phrase must leave behind a trace. On the other hand, the latter (i.e. 35) can make unnecessary a rule of COMP-Indexing like 40, which is adopted in Huang 1982 and Lasnik & Saito 1984. In other words, under the analysis using the assumption that an element can be γ-marked anywhere, the effect of COMP-Indexing can be reduced to the relationship of c-commanding of a wh-phrase in COMP, so that 40 is not required.

(40) COMP-Indexing (at S-structure and LF)

\[
[\text{COMP} \ldots X_i \ldots] \rightarrow [\text{COMP} \ldots X_i \ldots], \text{ if } \ldots \text{ includes no } Y_j.
\]

3. Properties of multiple wh-questions. Having so far summarized the analysis proposed by Chomsky 1987, we are now in a position to examine whether the revised ECP can account for the data of multiple wh-questions. Before going on to the main discussion, we must inquire into the properties of multiple wh-questions. First of all, let us consider

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\(^5\) I assume that the structure of Pre-IP position is

\[
[\text{CP} [\text{NP \{what/why\} [\text{NP who]} ] \text{IP}].
\]
what kind of multiple *wh*-questions are observed as linguistic data. The major examples are as shown in 41.⁶

(41) a. A *wh*-phrase is in-situ in the position of possessive.
   Who saw whose mother?

b. A *wh*-phrase is in-situ in the specifier position of CP.
   Who knows which pictures of whom Bill bought?

c. A *wh*-phrase is in-situ in subject position:
   i. Who thinks that pictures of whom would please John?
   ii. ?Who said that for Bill to marry who was a surprise?

d. A *wh*-phrase is in-situ within NP:
   i. Who likes books on which table?
   ii. Who met the man from which city?

e. A *wh*-phrase is in-situ within an adverbial phrase or clause:
   i. Who fell asleep during which class?
   ii. Who cried after John hit who?
   iii. Who left before who fixed the car?
   iv. *Who left before fixing the car why/how?

f. A *wh*-phrase is in-situ within the complement clause of a verb:
   i. Who said that John bought what?
   ii. ?Who said that who won the race?
   iii. *Who said that John left why?
   iv. *Who does John believe that who suspected t?

g. A *wh*-phrase is in-situ within a complex NP:
   i. Who believes the rumor that John is going to marry whom?
   ii. ?Who believes the rumor that who is going to marry John?
   iii. *Who believes the rumor that John is going to marry Susan why?
   iv. *Who does Bill believe the rumor that who is going to marry t?

h. A *wh*-phrase is in-situ within a *Wh*-island:

⁶ The examples in 41 are cited from Huang 1982, May 1985, Chomsky 1986, and others.
i. Who remembers why we bought what?
ii. *Who remembers where who bought the piano?7
iii. *Who remembers what we bought why/how?
iv. *What do you remember that who bought t?

j. A wh-phrase is in-situ in the subject position of an infinitival clause.
i. Who suspects who to be a spy?
ii. Who does Mary expect t to buy what?
iii. *What does Mary expect who to buy t?

k. Superiority effects
i. Who did you tell to read what?
ii. *What did you tell who to read?

These data of multiple wh-questions we can classify into the following 4 types:

(42) Type 1. When a wh-phrase in-situ occurs in the complement position of a verb or a preposition, the sentence is grammatical. The same thing is true when it occurs in the embedded subject of ECM structure ((41b), (41c), (41d), (41ei, ii), (41fi), (41gi), (41hi), (41ji, ii), (41ki) etc.).

Type 2. When a wh-phrase in-situ occurs in the subject position of an embedded clause or an adverbial clause, the sentence is not grammatical if the specifier of the clause includes a wh-phrase ((41hii) etc.), but otherwise it is grammatical ((41eiii), (41fii), (41gii) etc.).

Type 3. When a wh-phrase in-situ is an adjunct, the sentence is ungrammatical ((41eiv), (41fiii), (41giii), (41hiii) etc.).

Type 4. When a wh-phrase in-situ c-commands the initial trace of a wh-phrase in the specifier of CP, the sentence is not grammatical ((41fiv), (41giv), (41hiv), (41jiii), (41kii) etc.), but the sentence is grammatical when the wh-phrase in-situ is c-commanded by the trace (41jii), (41ki) etc.).

And so, if LF wh-movement applies to the sentences in 41, it yields the four LF-representations below, respectively.

(43) a. ... [XP wh [XP x⁰ t]] (x=v or p)8

---

7 Lasnik & Saito 1987 point out that only if the embedded subject who takes a matrix scope, the sentence is grammatical.
8 PP adjunction may be questionable, since a sentence like (i) cannot be excluded by the ECP if PP adjunction applies to it.

(i ) *Which class did you sleep during t?
b. i. *... [CP [NP wh; [NP whj]] [IP ti [VP ... tj ...]]]
   ii. ... [CP/PP [NP wh; [COMP that/before]] [IP ti [VP ...]]]

   c. *(...) [CP [NP wh; [NP whj]] [IP ... tj ... t_i ...]] (wh;=an
      adjunct)

   d. i. [CP [XP whj [XP whi]] [IP ... t_i ... tj ...]] (XP=NP, PP,
      ii. *[CP [XP whj [XP whi]] [IP ... t_i ... t_i]] or Adv P)

In 43a, there is no issue since the trace t in question is antecedent-
governed and is γ-marked in the same way as in 37. Nor can a problem
arise in 43c, because the adjunct trace ti is not c-commanded by the wh-
phrase in the specifier position of CP and thus is not antecedent-
governed, whether or not there is a barrier between them, as in 41eiv and
41fiii. Next, there seems to be nothing wrong with 43b at first sight. In
particular, the trace ti in 43bi, but not in 43bii, is neither c-commanded
nor antecedent-governed by the antecedent in the specifier of CP. Thus,
it seems that 43bi would be an ECP violation. In 43bii, on the contrary,
the proper governor of the trace should be a wh-phrase under this analy-
sis. However, this would be to contradict Chomsky's explanation of the
that-trace effects. Let us consider sentences like 44:

   (44) a. Who wonders whether who wrote the paper?
   b. Who left before who fixed the car?

The application of LF-movement to 44a will yield a representation like
45.

   (45) ... [CP who; [C' [COMP whether]] [IP ti [VP ...]]]

Similarly, if LF-movement applies to 44b, it will derive 46 if PP has a
structure like [PP P [IP ...]].

   (46) ... [PP who [PP [P' [P before]] [IP t fixed the car]]]

In both 45 and 46, the preposed wh-phrase c-commands its trace, so 35
ensures that the trace is antecedent-governed by the antecedent who.
Recall here, however, how the ECP accounts for the well-known “that-
trace” effects, as shown in 47:

   (47) Who do you think [CP t' [C' [COMP that]] [IP t saw the book]]?

Chomsky's explanation is as follows: the intermediate trace t' cannot
antecedent-govern the embedded subject trace t because of the interven-
tion of the minimality barrier [C', IP] between them. If this argument is
on the right track, 45 and 46 will be in violation of the ECP, since there in-
tervenes the minimality barrier [C', IP] or [P', IP] between the embedded

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9 This structure is proposed in Lasnik & Saito 1987.
subject trace and its antecedent. It follows, therefore, that to explain the grammaticality of sentences like 44, we must set up a new theoretical device.

Furthermore, another problem arises in 43dii. For example, let us consider 41kii, whose LF-representation is shown in 48 below:

\[(48) \ [CP \ [NP \ who_j \ [NP \ what_i] \ [IP \ you \ told \ t_j \ to \ read \ t_i]]]\]

In 48, \(t_i\) and \(t_j\) are the complements of the verbs told and read, respectively. Thus, 48 would include in part the structure 43a, which is not, as discussed above, in violation of the ECP. However, sentence 41kii is not grammatical. Therefore, the ECP cannot predict the ungrammaticality of 41kii.

To sum up, it seems that the revised ECP has these two kinds of problem. In section 4, I will propose a means of solving them.

4. A PROPOSAL. First of all, I will deal with the problem concerning superiority effects, which, as we have discussed in section 3, clearly do not seem to fall under the ECP. The sentence 41k, which is repeated below in 49, illustrates such a pure superiority contrast.

\[(49) \ a. \ Who \ did \ you \ tell \ to \ read \ what?\]
\[b. \ *What \ did \ you \ tell \ who \ to \ read?\]

To account for this contrast, Lasnik & Saito 1987 propose the AC 18, but, as we pointed out above, their analysis has a drawback with regard to the application of the AC and the ECP to multiple wh-questions; we cannot decide which of the AC and the ECP we should apply to them. Note that 49 has 43d in part as its LF-representation, in which the well-formed structure contains the configuration of c-commanding of the trace of a wh-phrase in-situ by the trace of a wh-phrase first preposed in the pre-IP position. On the basis of this fact, I would like to propose the Absorption Principle 50 to account for superiority effects.

\[(50) \ Absorption \ Principle \ (AP):\]

In the structure \([CP \ [XP \ wh_j \ [XP \ wh_i]] \ [IP \ ... \ t_i \ ... \ t_j \ ...]]\) where the initial traces \(t_i\) and \(t_j\) are in either order, \(wh_i\) and \(wh_j\) can undergo absorption if \(t_i\) c-commands \(t_j\).

If we apply the LF-movement rule to 49, we have 51 as its LF-representation:

\[(51) \ a. \ [CP \ [NP \ what_j \ [NP \ who_i]] \ [IP \ you \ told \ t_i \ to \ read \ t_j]]\]
\[b. \ *[CP \ [NP \ who_i \ [NP \ what_j]] \ [IP \ you \ told \ t_j \ to \ read \ t_i]]\]

In 51a, the trace \(t_i\) of \(who_i\) c-commands the trace \(t_j\) of \(what_j\), while in 51b, the trace \(t_i\) of \(what_i\) does not c-command the trace \(t_j\) of \(who_j\). Thus,
according to 50, absorption of *who* and *what* in 51a, but not in 51b, will be possible. Similarly, the AP can predict the contrast in 41jii and 41jiii as well as the ungrammaticality of 41fiv, 41giv, and 41hiv.

(41)  
  j. ii. *Who does Mary expect t to buy what?*
  iii. *What does Mary expect who to buy t?*
  f. iv. *Who does John believe that who suspected t?*
  g. iv. *Who does Bill believe the rumor that who is going to marry t?*
  h. iv. *What do you remember that who bought t?*

At the supposed LF-representations of the ungrammatical sentences above, the traces of the *wh*-phrases created by a syntactic *wh*-movement rule would not c-command the traces of the *wh*-phrases left behind by LF *wh*-movement rule. Thus, according to 50, the two *wh*-phrases cannot undergo absorption and therefore these sentences will not be interpreted properly.

Next, let us consider the relationship of the ECP and the AP. Considering 33 again, we have the following LF-representation:

(52)  
  a. I asked [CP [NP whati [NP whoi]] [IP ti [VP tji' [VP bought tj]]]]
  b. *I asked [CP [NP whyj [NP whoi]] [IP ti [VP tji' [VP bought tj]]]]

In 52a and 52b, the trace ti c-commands the trace tj, so that the AP is not violated. As explained in section 2, the ungrammaticality of 52b is due to the ECP, since the intermediate trace tj of whyj, which must not be deleted, is not properly governed. On the contrary, in 25 below which is a problematic example for Lasnik & Saito 1987, the AC is in violation while the ECP is satisfied.

(25)  
  a. *Howi did you think that whoj solved the problem ti?*
  b. *Whyi did you say that whoj bought the book ti?*

At the presumed LF representation of 25, the trace of whoj is properly governed by the raised INFLj. However, the trace ti of howi or whyi, which is created in syntax, could not c-command the trace of whoj, which must be adjoined to howi or whyi at LF. Thus, absorption of howi (or whyi) and whoj will not be possible.

Furthermore, the AP will account for the ambiguity of 26 and the grammatical status of 27, both of which are also, as we pointed out in section 1.3., the problem with Lasnik & Saito's analysis.

(26)  
  a. Who remembers where Bill saw what?
  b. Who remembers when Bill bought what?

(27)  
  a. *Why did you buy what?*
  b. Tell me why you bought what.
If the LF-movement rule applies to 26a and 27a, it will yield 53 and 54, respectively.

(53)  
   i. \[CP \ [NP \ what_j \ [NP \ who_i]] \ [IP \ t_i \ remembers \ [CP \ where \ Bill \ saw \ t_j]]\]
   ii. \[CP \ who_i \ [IP \ t_i \ remembers \ [CP \ [NP \ what_j \ [NP \ where_k]] \ [IP \ Bill \ \[V' \ saw \ t_j \ t_k]]\]

(54) \[CP \ [ADV \ what_j \ [ADV \ why_i]] \ [IP \ you \ \[V' \ buy \ t_j \ t_i]]\]

In 53i, the trace \(t_i\) of \(who_i\) c-commands the trace \(t_j\) of \(what_j\) and in 53ii, the trace \(t_k\) of \(where_k\) c-commands the trace \(t_j\) of \(what_j\). That is, the AP is satisfied with 53i and 53ii. Furthermore, all the traces (i.e. \(t_i\), \(t_j\), and \(t_k\)) are properly governed and thus would satisfy the ECP. Thus, 26a can be ambiguous between multiple direct questions and multiple indirect questions. On the other hand, in 54, \(what_j\) is a complement of the verb \(buy\) and thus its trace \(t_j\) is antecedent-governed. And the requirement of antecedent government will be satisfied in each link of the chain of \(why_i\), since the link is formed by a regular syntactic movement rule. In other words, 54 satisfies the ECP. Moreover, \(t_i\) c-commands \(t_j\), and consequently \(what_j\) and \(why_i\) in 54 can undergo absorption in accordance with 50.

Finally, let us consider 28, whose LF-representation, omitting several intermediate traces, is shown in 55:

(55)  
   a. \[CP \ [NP \ why_j \ [NP \ who_i]] \ [IP \ t_i \ said \ that \ John \ left \ t_j]]\]
   b. \[CP \ [NP \ why_j \ [NP \ who_i]] \ [IP \ t_i \ left \ before \ fixing \ the \ car \ t_j]]\]

As is obvious in 55, the AP is satisfied, since \(t_i\) c-commands \(t_j\). However, the ECP is violated for the same reason as in 43c.

In effect, reexamining the problems with Lasnik & Saito’s analysis, we have the diagram 56.

<table>
<thead>
<tr>
<th></th>
<th>(24)(^{10})</th>
<th>(25)</th>
<th>IQ of (26)</th>
<th>(27)</th>
<th>(28)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECP</td>
<td>ok</td>
<td>ok</td>
<td>ok</td>
<td>ok</td>
<td>out</td>
</tr>
<tr>
<td>AP</td>
<td>ok</td>
<td>out</td>
<td>ok</td>
<td>ok</td>
<td>ok</td>
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<td>ok</td>
<td>out</td>
<td>ok</td>
<td>ok</td>
<td>out</td>
</tr>
</tbody>
</table>

Accordingly, we can state the relationship between the ECP and the AP in the following way:

\(^{10}\) As for 24, we will discuss it later.
Multiple *Wh*-questions must satisfy both the Absorption Principle and the ECP.

Next, I will consider the first problem mentioned in section 3. We have argued that the minimality barrier \([P', IP]\) or \([C', IP]\), the latter of which blocks the proper government of the subject trace in the "that-trace" structure, would also prevent the subject trace of a LF-representation from being properly governed by its antecedent, as shown in 41 and 44:

(41)  
e. iii. Who left before who fixed the car?  
f. ii. ?Who said that who won the race?  
g. ii. ?Who believes the rumor that who is going to marry John?

(44)  
a. Who wonders whether who wrote the paper?

In other words, 41 and 44 show that the proper governor of the subject trace at their presumed LF-representations should not be an intermediate trace of the subject *who*, since if the proper governor is an intermediate trace, sentences like 41 and 44 would be ruled out by the ECP, in the same way as 58.

(58)  
a. *Who do you think that t won the race?  
b. *Who did John left before t fixed the car?  
c. *Who do you wonder whether t wrote the paper?

To save 41 and 44 and at the same time to rule out 58, we must rely on a means which belongs to LF only. Here, if we assume that the INFL raising, which is proposed in Lasnik & Saito 1987, applies to 41 and 44, then we will have the following LF-representations:

(41)'  
e. iii. [...] [IP INF Li [IP t fixed the car]]

(44)'  
a. [...] [CP whoj [C [C whether]] [IP INF Li [IP t i [VP ...]]]

In 41' and 44', the subject trace is properly governed by the raised INF Li, which ensures that 41 and 44 are grammatical. The same holds for 24, with which the AP is also satisfied because of the c-commanding of the trace of *whoj by the trace of the matrix subject *whoj at the LF-representation. However, the INFL Raising cannot apply to 58, so that 58 is excluded by the ECP.

Before concluding my argument, I will consider Lasnik & Saito's observation that sentence 59 is ungrammatical with *whoj interpreted in the...
lower specifier of the CP along with what_k, while 59 is drastically im-
proved in the reading where who_j takes a matrix scope.

(59) Who_i t_i wonders what_k who_j bought t_k?
In 59, the traces t_i and t_k are antecedent-governed by their respective wh-
phrases. Then, the LF wh-movement applies to 59, yielding 60:

(60) a. *[CP who_i [IP t_i wonders [CP [NP who_j [NP what_k]] [IP INFL_j [IP
t_j bought t_k]]]]]

b. [CP [NP who_j [NP who_i]] [IP t_i wonders [CP what_k] [IP INFL_j
[IP t_j bought t_k]]]]]

The embedded subject trace t_j in both 60a and 60b is properly governed
by the raised INFL_j, so that 60 satisfies the ECP. However, note that in
60b, but not in 60a, the trace of a wh-phrase first preposed in the specifier
of the CP c-commands the trace of a wh-phrase with which the former
wh-phrase undergoes absorption. In accordance with the AP, therefore,
59 can be grammatical only with who_j associated with who_i.

5. A SUMMARY.
We have argued in section 1 that the proper gover-
nor of an empty category cannot be defined by referring to \(\theta\)-gov-
ernment, Case-assignment, and \(X^0\) category. In particular, we have pointed
out some problems concerning Lasnik & Saito’s Absorption Condition,
which is supposed to account for superiority effects. In section 2, we
have summarized Chomsky’s 1987 analysis. Furthermore, in section 3
we have examined the properties of multiple wh-questions and indicated
that some problems arise in Chomsky’s analysis. To solve the problems,
in section 4, the Absorption Principle has been proposed. Finally, it has
been shown that multiple wh-questions must satisfy both the ECP and
the Absorption Principle.

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