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Superiority Violations*

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In this paper, we discuss standard Superiority violations and Pure Superiority violations. We will first show that standard versions of the Empty Category Principle (ECP) are too weak in their application to Superiority violations, as originally observed by Hendrick and Rochemont (1982). We then propose a revision of the ECP which not only derives both Superiority and Pure Superiority but further matches degrees of grammaticality with violations of Locality Conditions at different levels of representation.

1. What are Superiority and Pure Superiority Violations?

In English, Wh-in situ (i.e. wh-phrases that appear in their base-generated positions at S-structure) is licensed exclusively in multiple questions. As is well known, Wh-in situ in English, displays subject/object asymmetries. Consider the well-known paradigm in (1) and (2):

- (1) a. $\text{who}_i \text{ t}_i \text{ bought what}_j$
 b. [For which (x, y)] [x bought y]
- (2) * $\text{what}_j \text{ did who}_i \text{ buy t}_j$

In (1a), the subject Wh-phrase is in COMP at S-structure while the object Wh-phrase is in-situ and the sentence is grammatical with a reading

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of a multiple question. The speaker expects an answer with ordered pairs of buyers and things bought (as represented in (1b)). In contrast, in (2), the object Wh-phrase is in COMP at S-structure while the subject Wh-phrase is in-situ and the sentence is ungrammatical. It cannot have the reading of a multiple question; it can only have an echo interpretation. To derive these contrasts, two assumptions have been made in the literature: 1) Wh-phrases in-situ undergo movement in the mapping from S-structure to LF (as originally proposed by Chomsky (1973) and Kayne (1979)) and 2) The ungrammaticality of (2) is derived by a constraint on this LF-movement (or on its trace); namely the ECP (stated in (3)), provided, of course, the latter is a constraint on LF representations.

(3) The Empty Category Principle (ECP) (Lasnik and Saito 1984)

- a) A non-pronominal empty category must be properly governed.
- b) α properly-governs β if α governs β and
 - i) α is a lexical X^0 (lexical government),
 - or ii) α is coindexed with β (antecedent-government)

Consider the LF representations derived from (1a) and (2), shown in (4). (LF movement is indicated in bold letters)

- (4) a. $CP[\mathbf{what}_j \text{ who}_i \text{ IP}[t_i \text{ bought } t_j]]$
b. $*CP[\mathbf{who}_i \text{ what}_j \text{ did}_j \text{ IP}[t_i \text{ buy } t_j]]$

In (4a), both traces satisfy ECP. The trace of the object is lexically governed by the verb and the trace of the subject is antecedent governed by the Wh-phrase. Specifically, for both Aoun, Hornstein and Sportiche (1981) and Lasnik and Saito (1984, 1989), antecedent-government obtains because 1) COMP is a maximal projection on its own, 2) the landing site of Wh-movement is COMP and 3) movement to COMP triggers COMP-indexing at S-structure. In (4b), the trace of the object is properly governed but the

trace of the subject is not properly governed since COMP has acquired the index of *what* at S-structure.

However, as has been shown by Hendrick and Rochemont (1982), Pesetsky (1982) and Lasnik and Saito (1989), there are other superiority effects which clearly do not fall under the ECP. Consider the examples in (5) to (7). They are instances of the so-called Pure Superiority:

- (5) a. who_i [did] you expect [t_i to read what_j]
b. ?? what_j [did] [you expect [who_i to read t_j]]
- (6) a. who_i did you persuade t_i [PRO to buy what_j]
b. ?? what_j did you persuade whom_i [PRO to buy t_j]
- (7) a. what_i did you give t_i to whom_j
b. ?? who_j did you give what_i to t_j

Note the contrast in degree of grammaticality between Pure and standard superiority: standard superiority violations yield ungrammatical sentences whereas Pure Superiority violations yield marginal sentences.

In (5) to (7), all the wh-traces are lexically governed at both S-structure and LF. That is, they are all either Case-marked or Case and theta-marked by a lexical head. Thus, Pure Superiority cannot be explained by standard versions of ECP since all of the wh-traces are properly governed at both S-structure and LF.

2. Previous Analyses of Superiority and Pure Superiority

Chomsky (1973) first noted that a Superiority Condition applies to multiple interrogations in English. It can account for all the above contrasts. His Superiority Condition is stated in (8).

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(8) Superiority Condition (Chomsky (1973))

- a. No rule can involve X, Y in the structure
... X ... [a... Z ... -W Y V ...] ...
where the rule applies ambiguously to Z and Y and Z is superior to Y.
- b. "...the 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." (p. 101)

Note that (8) is a constraint on movement at S-structure. It basically entails that when a Wh-phrase is in COMP and another Wh-phrase is in-situ, the trace of the Wh-phrase in COMP must c-command the Wh-in situ. Thus, the S-structure in (5a) is grammatical since the trace of *who* c-commands *what*. On the other hand, the S-structure in (5b) is ill-formed since the trace of the Wh-phrase *what* in COMP does not c-command the Wh-in situ *who*. The Superiority Condition was later subsumed under the ECP which, as we have seen, fails to handle the cases of pure Superiority given in (5) to (7).

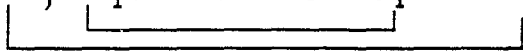

Pesetsky (1982) derives Pure Superiority and Standard Superiority Violations from his Path Containment Condition, a version of which is stated in (9).

(9) Nested Dependency Condition (Pesetsky 1987)

If two wh-trace dependencies overlap, one must contain the other.

Note that (9), as opposed to Chomsky's Superiority Condition filters out LF representations. This condition rules out the LF representation in (5b) because the Wh-trace dependencies in (5b) cross. On the other hand, in the LF representation in (5a), the Wh-trace dependencies are nested. This is shown in (10)

(10)

- a. [what_j who_i [did] [you expect [t_i to read t_j]]]

- b.* [who_i what_j [did] [you expect [t_i to read t_j]]]


Finally, both Hendrick and Rochemont (1982) and Lasnik and Saito (1989) argue that the Superiority Condition cannot be subsumed under the ECP and must be maintained as an independent condition. Lasnik and Saito proposes (11) to handle Superiority violations.

(11) Lasnik and Saito (1989)

- a. A Wh-phrase X 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.

In fact, Lasnik and Saito argue that all superiority violations must be handled by the condition in (11). That is, they assume (for reasons that we will discuss later) that the subject position in English is always properly governed by Infl at LF. Hence, ECP will rule out neither standard nor Pure superiority violations. These violations will be ruled out solely by (11). Note that (11a) applies at S-structure. Representations violating (11a) are not interpreted as multiple questions since at LF they fail to undergo absorption. (The rule of Absorption proposed in Higginbotham and May (1981) ensures that the set of Wh-operators in COMP at LF behaves like a single operator binding different variables).¹

Let's see how (11) operates. At S-structure, (11) will mark *what* and *who* in (5b) (or in (2)) as operator-disjoint since assigning the index

¹ Note that (11) is consistent with Hendrick and Rochemont's proposal that the difference between echo and multiple questions is that echo questions fail to undergo absorption (the wh-in situ having wide scope).

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'j' of *what* to *who* in (5b) will result in the local A'-binding of *who* by *what*. This is shown in (12a).

- (12) a. *_{CP}[*what*_j [*did*] _{IP}[*you* expect [*who*_j to read *t*_j]]]
b. *_{CP}[*who*_i *what*_j [*did*] _{IP}[*you* expect [*t*_i to read *t*_j]]]

The LF-representation derived from (12a) (given in (12b)) will then be ill-formed since absorption fails. On the other hand, in (5a) (or (1a)), *who* and *what* will not be marked operator-disjoint at S-structure. Assignment of the index 'i' of *who* to *what* will not yield local A'-binding of *what* by *who* because of the intervening trace *t*_i. This is shown in (13a).

- (13) a. [*who*_i [*did*] [*you* expect [*t*_i to read *what*_j]]]
b. [[**what** *who*]_{ij} [*did*] *you* expect [*t*_i to read *t*_j]]]

The LF representation derived from (13a) (given in (13b)) will be well-formed since absorption is free to take place at LF.

3. Our proposal

We have seen that there are two basic positions with respect to superiority violations: (1) Superiority violations are subsumed under ECP; this is problematic because of Pure Superiority; (2) Superiority cannot be handled by a general principle but requires a specific S-structure condition. These superiority conditions are just descriptive generalizations.

We argue that these two apparently contradictory positions are both correct. That is, both Pure Superiority and standard superiority should be ruled out by an S-structure condition and should fall under the ECP. We will show that by revising the ECP minimally, we can capture the insights

underlying these two positions. Specifically, we propose the following four modifications of the standard definition of ECP.

First of all, note that proper government as stated in (3b) is a disjunction of two locality conditions; namely lexical government and antecedent government. Following Chomsky (1986), Noonan (1988), Rizzi (1990) and Aoun, Hornstein, Lightfoot and Weinberg (1987) (henceforth WAHL), we assume that Proper Government is not a disjunction but a conjunction of two distinct locality conditions. Second, we propose that these two Locality Conditions are not the standard lexical and antecedent government requirements given in (3b) but what we will call X^0 -government and XP-government.

Thirdly, we propose that these Locality Conditions each apply at a given level of representation: XP-government holds at S-structure and X^0 -government holds at LF (for other proposals that split ECP into two locality conditions applying at different levels of representation, see WAHL). This is stated in (14)

(14) The Empty Category Principle

- a. S-structure: a non-pronominal empty category must be XP-governed.
- b. LF: a non-pronominal empty category must be X^0 -governed.

Finally, we propose to match violations of locality constraints at different levels of representation with gradations in grammaticality: violations at both S-structure and LF yield ungrammaticality (i.e. ECP effects) and violations at either level yield weak grammaticality, (i.e. subjacency effects).

Now, what are X^0 -government and XP-government? The general idea is the following: X^0 -government is government by a head. There are

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three types of relations that a head can hold with an NP: 1) an X^0 can theta-mark an NP, 2) an X^0 can Case-mark an NP, and 3) an X^0 can bind an NP. By this, we mean that the X^0 c-commands and is co-indexed with the NP. We will call this relation antecedent government by an X^0 . Hence, we assume that when any of these three relations holds, an NP is X^0 -governed. What about XP-government? This is government by a maximal projection. There is only one type of relation that can hold between two XPs, namely, co-indexation. We call this relation antecedent government by an XP. To satisfy XP-government, a trace must be co-indexed with a c-commanding XP. We, thus, define X^0 -government and XP-government in (15) and (16).

- (15) α X^0 -governs β iff
- i) α is an X^0 category and α c-commands β ;
 - and ii) α θ -marks or Case-marks β
 - or iii) α is co-indexed with β and there is no γ , γ an X^0 , such that γ c-commands β but does not c-command α
- (16) α XP-governs β iff
- i) α is an XP c-commanding and coindexed with β
 - ii) β is subjacent to α
 - and iii) there is no γ such that γ is a potential antecedent governor (PAG) for β , and γ c-commands β but does not c-command α .

Let's briefly go through (15) and (16). Given (15i) and (15ii), a trace is X^0 -governed if it is Case-marked or θ -marked by a c-commanding head. Thus, for instance I^0 does not X^0 -govern the subject in Spec of IP. Given (15i) and (15iii), a trace is also X^0 -governed if it is co-indexed with a c-commanding head. This will allow, for instance, COMP to X^0 -govern a subject trace. Let's turn to XP-government in (16). Given (16i), a trace is XP-governed if it is c-commanded by its antecedent. Further, we want XP-government to subsume subjacency; this is stated in (16ii) but we will not

discuss it because it is not relevant in this paper. Finally, both X^0 and XP government obey Rizzi's (1989) relativized minimality, as stated in (15iii) and (16iii) respectively.

We will now show that "Pure superiority violations" are S-structure violations; that is, they are violations of XP-government, since XP-government holds at S-structure. In contrast, standard superiority violations are violations at both levels of representation: of XP-government, at S-structure and of X^0 -government, at LF. Recall that Pure Superiority violations are weaker than standard superiority violations. This grammaticality contrast will follow from the conception of ECP we have just outlined. We will first examine Standard Superiority Violations and Pure Superiority Violations to see if and how they respect X^0 -government. We will then turn to XP-government.

3.1. X^0 -government.

Recall that X^0 -government, as defined in (15), holds at LF. Now, consider the paradigms of LF-representations, given in (17) and (18) on the hand-out:

(17) Pure Superiority

- a. ??What did you expect who to read?
LF: ??[who_i what_j [did]_j [you expect [t_i to read t_j]]
- b. Who did you expect to read what?
LF: [what_j who_i [did]_i [you expect [t_i to read t_j]]
- c. ??What did you persuade whom to buy?
LF: ??[who_j what_i [did] you persuade t_j [PRO to buy t_i]]
- d. Who did you persuade to buy what?
LF: [what_j who_i [did]_i you persuade t_i [PRO to buy t_j]]
- e. ??Who did you give what to?
LF: ??[what_i who_j [did] you give t_i to t_j]

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- f. What did you give to whom?
 LF: [whom_j what_i [did]_i you give t_i to t_j]
- (18) Standard Superiority
- a. *What did who fix?
 LF: *[who_j what_j [did]_j [t_i fix t_j]]
- b. *How did who fix the car?
 LF: *[who_j how_j [did]_j [t_i fix the car t_j]]
- c. Who fixed what?
 LF: [what_j who_i c_i]_i [t_i fix t_j]

The basic generalization underlying the difference between Pure and standard superiority is that in the former but not the latter, all the Wh-traces are lexically governed. Indeed, within the Superiority literature, this has been at the core of the problem: if all the Wh-traces are lexically governed, then how can superiority be subsumed under the ECP? Within this approach, this simply means that Pure superiority does not violate both Locality Conditions and not that it cannot be subsumed under ECP. In the Pure Superiority cases listed in (17), the object traces are all Case-marked by a lexical head (either V or P). Thus, Pure Superiority always satisfies X⁰-government

Let us now turn to the standard superiority violations in (18a-c). Again, the object traces are all always properly governed. What about subject traces and adjunct traces? Following Stowell (1981), WAHL and L & S, we assume that a subject or an adjunct wh-trace can be head-governed by the COMP immediately c-commanding it. Specifically, syntactic movement of a Wh-phrase to SPEC of CP triggers SPEC-head agreement. COMP is thus assigned the index of its specifier. It can now serve as an X⁰-governor. In (18a) and (18b), the head-government requirement is violated at LF: the trace of *who* is not X⁰-governed at LF since at S-structure, COMP has already acquired an index from the Wh-phrase in its

specifier: from *what* in (18a) and from *how* in (18b), respectively. In (18c), on the other hand, the subject trace is X^0 -governed by COMP since the latter has acquired the index of its antecedent *who* at S-structure.

We have seen that standard superiority violates X^0 -government at LF while Pure Superiority does not. We will now see that both violate XP-government. The idea we are going to pursue is the following: strong violations are violations at both levels of representation. Hence, standard superiority violations are violations at both S-structure and LF. On the other hand, Pure Superiority are milder violations: they are not violations at both levels of representation. Since they clearly do not violate the LF head government requirement, they must only be violations of XP-government at S-structure.

3.2. XP-government

Why are standard and Pure Superiority violations of XP-government at S-structure? To answer this question, let's examine more closely the S-structures given in (1) and (5)-(7), repeated for convenience in (19) and (20).

(19) Standard Superiority (S-structure representations)

- a. *[What_j [did]_j [who_i fix t_j]]
- b. *[How_j [did]_j [who_i fix the car t_j]]
- c. [Who_i c_l]_i [t_i fixed what_i]

(20) Pure Superiority (S-structure representations)

- a. ??[What_j [did]_j [you expect [who_i to read t_j]]]
- b. [Who_i [did]_i [you expect [t_i to read what_j]]]
- c. ??[What_j [did]_j you persuade whom_i [PRO to buy t_j]]]
- d. [Who_i [did]_i you persuade t_i [PRO to buy what_j]]]
- e. ??[Who_j [did]_j you give what_i to t_j]
- f. [What_i [did]_i you give t_i to whom_j]

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All the good sentences in (19)-(20) have the canonical S-structure in (21). On the other hand, all the bad sentences have the canonical S-structure in (22).

- (21) ...wh_i...t_i...wh_j
(22) *...wh_i...wh_j...t_i

The Superiority condition proposed by Chomsky and L&S ensures that only S-structures like (21) are ruled in. What we propose is to rule out S-structures like (22). Why is (22) ill-formed? In (22), there is closer binder or Potential antecedent governor for the trace left by syntactic movement; namely, the wh-phrase in-situ. How do we formally capture (22)? Recall that XP-government, as defined in (16), requires an S-structure trace to be co-indexed with a c-commanding XP and that this relation must obey relativized minimality. Thus, if the Wh-phrase in-situ can count as a Potential Antecedent Governor, then (22) will violate XP-government. The problem, however, is that the Wh-phrase in situ in (22) is not in an A'-position. Hence, structurally, it cannot count as an operator; that is, it cannot count as a potential antecedent governor blocking the A'-relation between the Wh-operator in COMP and its trace. We propose that the wh-in-situ can count as a potential antecedent governor because it is an inherent operator. This proposal extends an idea proposed by Cinque (1986). Cinque distinguishes two types of S-structure operators: inherent operators on the one hand and structural operators on the other. A structural operator is any wh-phrase in COMP at S-structure. An inherent operator is a bare wh-quantifier like *who* or *what*, as opposed to wh-quantified NPs like *which*-phrases. In this light, consider the contrasts in (23) which is taken from Cinque (1986), (24) and (25):

- (23) (From Cinque 1986)
 a. SS:*[Who_j [did] you introduce who_i to t_j]
 b. SS: [Who_j [did] you introduce which people_i to t_j]
- (24) SS:*[Which people_j [did] you introduce who_i to t_j]
- (25) a. SS:*[What_j [did] [who_i buy t_j]]
 b. SS: [What books_j [did] [which people_i read t_j]]

Pesetsky (1987) explains the contrasts in (25) by assuming that *which*-phrases in situ, unlike *who* or *what* do not undergo LF-movement. Now, superiority is always ruled out by a constraint on movement; irrespective of whether this constraint is the ECP, some version of a Nested Dependency Condition or a special superiority condition. Hence, the assumption that *who* and *what* undergo LF-movement whereas *which*-phrases are assigned scope at LF by a method that does not involve movement correctly derives the above contrasts: (25a) is an echo question whereas (25b) is a multiple question.

Following Pesetsky (1987), Cinque argues that the contrast in (23) supports the claim that: "in A-position (i.e. 'in-situ') only bare wh-quantifiers, not wh-quantified-NPs, qualify as operators, and, hence, are able to move at LF and create an operator/variable configuration". Thus, Wh-quantified-NPs can only be structural operators: they are operators only when they are in an A'-position at S-structure; that is, when they are in COMP.

We propose that this distinction between inherent vs. structural operators is relevant for wh-movement, at S-structure. That is, we assume (26), following Cinque (1986):

- (26) A wh-phrase is an operator at S-structure iff:
 (i) it is structurally an operator (i.e. it is in COMP at S-structure),
 or (ii) it is inherently an operator (i.e. it is a bare Wh-quantifier).

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Given this assumption, bare *wh*-quantifiers in A-positions at S-structure (that is, in situ) will count as Potential Antecedent Governors blocking the relation between the *wh*-phrase in COMP and its trace in (22). Thus, in (23a), (24) and (25a), the *wh*-phrases in-situ are inherent operators c-commanding the traces left by syntactic movement. As such, they count as potential antecedent governors blocking antecedent government of the trace by its antecedent in COMP. In (23b) and (25b) on the other hand, the *wh*-phrases in-situ are neither structural nor inherent operators. Hence, they cannot count as potential antecedent governors blocking XP-government at S-structure. If, moreover, following Pesetsky, *wh*-phrases do not undergo LF-movement, then, there will be no violation of X^0 -government at LF. Hence, (23b) and (25b) are well-formed multiple questions since they violate neither of the two locality conditions stated in (13).

Let us now return to the standard and pure superiority violations listed in (19) and (20). In (19), we see that standard superiority always violates XP-government: *who* in (19a-b), is a potential antecedent governors since it is an inherent operator and it c-commands the object trace. Thus, (19a-b) violate the XP-government requirement. In (19c), on the other hand, the inherent operator *what* does not c-command the subject position. Hence, it is not a potential antecedent governors and (19c) satisfies XP-government. Turning to the Pure Superiority cases in (20), we see that all the good sentences (that is, (20b, d and e)), do not violate XP-government since the *wh*-words in-situ do not c-command the traces left by syntactic movement and, therefore, cannot count as potential antecedent governors. On the other hand, in (20a, c, and f), the *wh*-words in situ c-command the traces left by syntactic movement. Thus, in (20a),

the embedded subject *who* c-commands the object of the embedded verb *read*. Further, we predict the ill-formedness of (20c) and (20d), regardless of whether we assume that the direct object of either *persuade* or *give* is 1) the subject of a small clause (as in Kayne 1983) or 2) base-generated as the specifier of VP (as in Larson 1988). In either case, the wh-in-situ is structurally higher than the wh-trace: in (20c), *whom* c-commands the embedded clause [PRO to buy t_i] and in (20f), *what* c-commands the prepositional indirect object. Therefore, at S-structure, antecedent-government of the traces by their antecedents in COMP is blocked since it is not local.

3.3 Pure Superiority Violations and Standard Superiority Violations

To summarize, what are Pure Superiority Violations? They are violations of the Locality Condition at S-structure (XP-government). Specifically, they are violations at only one level of representation: at LF, all the wh-traces are X^0 -governed, and, thus they all satisfy the LF Locality Condition. What are Standard Superiority Violations? They are violations of both XP-government at SS and X^0 -government at LF.

4. Other extensions of our proposal.

As we said in our introduction, this theory of ECP was developed in order to account for degrees of grammaticality in S-structure and LF-extractions. In conclusion, we will show how the above proposals can derive other grammaticality contrasts. Thus, consider the contrasts in (27) noted by Lasnik and Saito (1989):

- (27) a. Who left?
 b. ?Who thinks that who left?
 c. ?Who wonders whether who left?

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d. *What did who buy?

As Lasnik and Saito point out, (27b) and (27c) do not have the status of ECP violations. That is, although these examples are marginal, they can still be interpreted as questions and have pair readings. (27d), on the other hand, is ungrammatical: it can only have an echo interpretation. Thus, it has the status of a strong ECP violation. To explain why (27b and c) do not have the status of an ECP violation, Lasnik and Saito assume that the subject position in English is always properly governed at LF by I^0 which adjoins to IP at LF. As they point out, this assumption is problematic because it gives (27b and c) the same status as the S-structure extraction in (27a). In other words, under their proposal (27a, b and c) are all equally grammatical since all the subject traces are properly-governed.

Within the framework we have developed, where gradations of grammaticality are matched with violations of locality constraints at different levels of representation, the above contrasts can be derived in a simple way. (27a) satisfies both XP-government at S-structure and X^0 -government at LF. Hence, (27a) is grammatical. (27b-c), on the other hand, are milder violations because only one of the Locality Conditions that constitute the ECP, is satisfied. XP-government is satisfied because when the matrix subject moves to the matrix COMP at S-structure, it does not cross another Wh-operator. However, X^0 -government at LF is violated. As we see in (28), once the matrix COMP has acquired the index of the Wh-phrase in its specifier at S-structure, it cannot head govern the trace left by LF-movement of the embedded subject to the matrix Comp; nor can the intermediate COMP serve as a head-governor since it is filled by a lexical complementizer:

(28) LF representations

- a. [who_j who_i [C]_i [t_i wonders_{CP}[whether [C]_k [t_j left]]]]
- b. [who_j who_i [C]_i [t_i thinks_{CP}[[C_{that}]_k [t_j left]]]]

Thus, since (27b-c) only violate X⁰-government at LF, they are only marginal. As for (27d), we have already seen why it violates both XP and X⁰-government and is, thus, ungrammatical.

4.1 Wh-adjuncts in-situ

Finally, consider the behavior of Wh-adjuncts in-situ:

- (29) a. How did John fix what?
- b. ??What did John fix how?
- b'. [(x, y) [John fixed y in manner x]]
- c. *How did who fix the car?

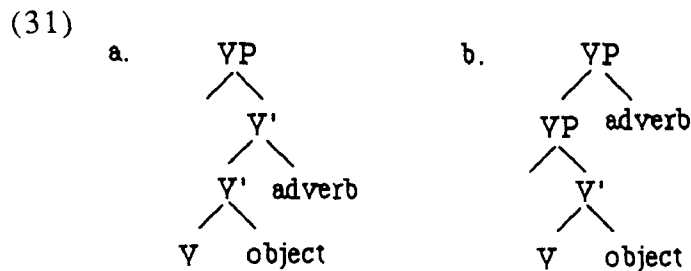
(29a) is a multiple question whereas (29b) is only acceptable as an echo question. What about (29b) with a Wh-adjunct in-situ? It is clearly worse than (29a) where the adjunct has moved in the syntax. However, it is far better than the superiority violation in (29c) which can only be an echo question. In general, Wh-adjuncts in-situ are problematic: there is gradation in grammaticality depending on the adjunct. Thus, *why*-in-situ is always bad, *how*-in-situ is more or less marginal (depending on the dialects) and *where*-in-situ is more or less fine (again depending on the dialects). However, although (29b) may be odd for some speakers, the point is that it can have the pair reading indicated in (29b'). Again, the above proposals derive the three-way contrast in (29) straightforwardly. In (29c), *how* crosses the inherent operator *who* at S-structure; and at LF, the subject trace is not head governed since COMP has acquired the index of *how* at S-structure. Thus, (29c) is ungrammatical because it violates both XP and X⁰-government. (29a) is grammatical because it satisfies both XP

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and X^0 -government. At S-structure, *how* does not cross *what* since it is structurally higher than the latter. At LF, the object trace is head-governed by the verb and the adjunct trace by the COMP co-indexed with its antecedent. Finally, (29b) is marginal. The trace of the adjunct is not head-governed at LF since it is neither Case nor theta-marked and COMP, as shown in (30), cannot X^0 -govern it since it is not co-indexed with its antecedent.

(30) LF: [how_j what_i [did] [John fix t_i t_j]

Now does (29b) satisfy XP-government? We assume that a manner adverb like *how* is adjoined to V', as in (31a.).



In (31a), the object and the adverb are within the same projection; namely V'. Hence, in (29b), *what* does not cross the adjunct-in situ when it moves to COMP and XP-government is satisfied. Further since only one locality condition is violated, (29b) is only marginal. Note that for dialects in which the equivalent of (29b) is ungrammatical, we can assume that the adverb is adjoined to VP, as in (31b). In (31b), the object and the verb are not within the same projection: the object is internal to V' the adverb is external to V'. Hence, S-structure movement of the object crosses the adverb and XP-government is violated. Since, moreover, X^0 -government is also violated, the sentence will be ungrammatical.

5. Conclusion

In this paper, we have proposed a theory of ECP which matches violations of Locality Conditions at different levels of representation with gradations in grammaticality: violations of both XP-government at S-structure and X^0 -government at LF yield ungrammaticality (that is, ECP effects), violations at either level yield weak grammaticality (that is, Subjacency effects). Standard Superiority is, thus, an instance of violations at both levels of representation; Pure superiority an instance of violations at S-structure and Wh-adjuncts in-situ, of violations at LF.

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