Complementation, Multiple wh and Echo Questions*
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0. Introduction

This paper treats the distribution and use of the feature [+/- WH] in structures of complementation, multiple wh constructions, and echo wh questions. It is argued in sections 1 and 2 that within the class of [-WH] elements fall the complementizers that, if, whether. The distribution of complementizers and wh phrases in COMP is treated through a system of filters on S-structures and the interpretation of LFs. Section 3 concerns itself with the S-structure and LF interaction of echo wh phrases, assumed to be [+WH], and [+/-WH] COMPs. Echo wh phrases are seen to behave as focused phrases at LF, in contrast with their multiple wh counterparts. The Superiority Condition of Chomsky (1973) is reinterpreted as a condition on the obligatory assignment of echo question interpretations, and demonstrated not to follow from the ECP as formulated in Chomsky (1981) and related work.

1. Complementation

Grimshaw (1979) offers an alternative view to the theory of complementation from that developed in Bresnan (1972) and Chomsky (1973). Hendrick (1980) cites sentences like

(1) a. You can't imagine what a fool John is!
b.*You can't imagine that John is such a fool!

As (1a) shows, imagine is a verb which selects an exclamative complement. In this respect, imagine is like amaze (cf. (2)). That is adopting the notation of Grimshaw (1979), both verbs appear in the semantic frame indicated in (3).

(2) I'm amazed what a fool John is!

(3) [_____ E]

Amaze and imagine differ, however, in what they syntactically subcategorize. As (1) shows, imagine requires a [+WH] COMP, even though the semantic type of the complement still satisfies (3), as in (1b). Amaze, on the other hand, shows no such restriction, as (4) demonstrates.

(4) I'm amazed that John is such a fool!

Hendrick proposes to express this difference between amaze and imagine by assuming that imagine subcategorizes the syntactic frame (5), whereas amaze subcategorizes (6).

(5) [_____ [S [+WH] S]]

(6) [_____ S]

There exist data of a nature similar to that in (1) that suggest that although whether can function semantically to introduce an interrogative complement, it does not satisfy subcategorization frames like (5). For instance, compare (7) with (8)-(11).

(7) a. John wonders what Mary is planning.
b. John wonders whether Mary is planning a party.
(8). a. John told Bill what Mary was planning.
   b. *John told Bill whether Mary was planning a party.

(9). a. Mary explained to us what she was doing.
   b. *Mary explained to us whether her solution was correct.

(10). a. John described to the class what the exam would be like.
   b. *John described to the class whether the exam would be difficult or easy.

(11). a. John doesn’t realize what Mary is planning.
   b. *John doesn’t realize whether Mary is planning a party.

Each of the matrix verbs in (7)-(11) selects the semantic frame (12).

(12) [ ___ Q]

Wonder, like amaze, can be said to subcategorize (6). On the assumption that whether is [-WH], we can ascribe the apparently odd behavior of the verbs in (8)-(11) to the fact that they, like imagine, subcategorize (5) rather than (6).

Given such verbs as those in (8)-(11), one might expect to find verbs which select Q (cf. (12)) but subcategorize (13).

(13) [ ___ [ [-WH] S] ]

Peter Culicover has suggested to us that doubt is just such a verb. Consider the sentences of (14).

(14). a. I doubt whether Mary is planning a party.
   b. *I doubt what Mary is planning.
   c. *I doubt who Mary is seeing.
   d. *I doubt how late the train will be.

As (15) shows, doubt not only selects Q, it also selects declarative complements (cf. (16)).

(15) I doubt that Mary is planning a party.

(16) [ ___ P]

Not all verbs that subcategorize [-WH] select P, however. Investigate differs from doubt in just this respect; it selects only [-WH] interrogative complements (cf. (17)).

(17). a. The police are investigating whether he lied to them (or not).
   b. *The police are investigating how long she lived at that address.
   c. *The police are investigating which girls he went home with.
   d. *The police are investigating where she went that evening.
   e. *The police are investigating that Mary left early.

We are proposing, then, that whether bears the syntactic feature [-WH] and appears only in [-WH] COMPs even though it functions semantically to introduce interrogative complements. We make the additional claim that precisely the same proposal holds for interrogative if, as can be seen by substituting if for whether in all the above relevant examples. This analysis is consistent with the Autonomous Syntax view of Hale, Jeanne and Flatto (1977). In simple terms, the syntactic features [+WH] and [-WH] on COMP do not uniquely identify interrogative and noninterrogative complements respectively, as is commonly assumed (cf. e.g. Chomsky (1973), (1981), Rouveure and Vergnaud (1980)). Rather, [+WH] identifies complements of type Q, E and [-WH] identifies complements of type Q, P, E. As might be expected, the semantic type of a complement is derivable on the basis of particular syntactic configurations as well as lexical properties of any
complementizer involved. For example, that introduces P and E., whether, if introduce Q, what a N introduces E, how ADJ a N introduces Q, etc. Of the Q introducing complementizers, only whether, if are [-WH]. We must assume, along the lines of Jaeggli (1980), that whether, if (and presumably also that, for), are optional expansions of COMP, and not deleted after S-structure as in Chomsky and Lasnik (1977). To account for the failure of a complementizer to appear in matrix COMP position (cf. Bresnan (1972)), we adopt the following filter:

\[
^[S \text{COMP}_\alpha ...], \text{where } \alpha \neq e \text{ and } S \text{ is a root sentence.}
\]

In order to ensure that a [+WH] COMP is always filled at S-structure, we adopt the [+WH] Filter of Aoun, Hornstein, and Sportiche (1981) (henceforth AHS), given in (18).

(18) *COMP unless it contains a [+WH] element.

We maintain the assumption of Chomsky (1973) that no interpretation is provided for a [+WH] element in a [-WH] COMP. We assume with AHS that relative pronouns, PRO, etc. are [-WH], and interpretable only in the domain of N.

The [+WH] Filter suggests that the matrix COMP of a simple direct question such as (19) is [-WH].

(19) Did Bill leave?

This in fact is not a surprising consequence, given that whether functions as the embedded correlate of Inversion in a sentence like (19); cf. (20).

(20) I don’t know whether Bill left.

For the interpretation of simple direct questions like (19), we adopt the analysis of Rochemont (1979). That is, we assume a set of template-like rules which define the semantic functions of matrix clauses as Q, E, or P, presumably without reference to the properties of COMP (cf. also Williams (1980)).

There is one further consequence that will prove relevant in section 2. Assuming with the [+WH] Filter the Doubly Filled COMP Filter of Chomsky and Lasnik (1977) (cf. (21)), it follows that a [+WH] COMP can never contain a [-WH] element like whether.

(21) *[COMP \alpha \beta], \text{where one of } \alpha, \beta \neq e.

Suppose whether was inserted in a [+WH] COMP. Then by the [+WH] Filter, that COMP must also contain a [+WH] element at S-structure. But then this COMP would violate the Doubly Filled COMP Filter. It follows, then, that whether can only appear in a [-WH] COMP, and cannot cooccur with any other elements in COMP at S-structure. A similar argument can be given for if, that, relative pronouns, PRO, etc.

To summarize, we agree with Grimshaw (1979) that selectional restrictions provide a necessary constraint on the range of clause types that can appear as complements to particular verbs. But we have argued that this appeal to selectional restrictions is not sufficient to predict the restrictions noted in connection with doubt, investigate, describe, etc. and that appeal to some additional mechanism is required. The mechanism proposed in Hendrick (1980) involves extending the subcategorization frames of particular verbs to make reference to the syntactic feature [WH] on COMP. (We note here that this proposal is problematic with respect to the definition of government advanced in Chomsky (1981), but
consistent with the proposals of Kayne (1980, 1981).) Under the simple assumption that whether is [-WH], we can adapt this same mechanism to also account for (8)-(11), (14), and (17).

This concludes our discussion of English complementation. We will proceed in the next two sections as follows. First, we will argue that independent support for our analysis of whether as [-WH] stems from the interpretation of multiple wh questions. We will then turn in section 3 to the interpretation of echo questions, which in many respects superficially resemble multiple wh questions. We will suggest there an analysis of echo questions consistent with the observations and proposals of section 2.

2. Multiple Wh Questions

Our argument in the preceding section that whether is [-WH] counters the assumptions of AHS and Chomsky (1973), (1981). We will now argue that the assumption that whether is [-WH] receives additional support in that it allows a natural characterization of the notion "uniform interpretation in COMP", introduced in Chomsky (1973). Chomsky introduces this notion in his discussion of the interpretive rule assumed to apply to wh-in-situ in an S-structure like (22) to determine the scope of the unmerged wh phrase.

(22) Who [t bought what]  
Following AHS, we will refer to this rule as wh Raising (wh R).

As a rule applying in the derivation of LF, wh R does not obey the Subjacency Condition nor the Doubly Filled COMP Filter (cf. AHS). As Chomsky (op. cit.) observes, however, wh R is subject to the restriction that it can only move a wh-in-situ to a COMP in which it can be interpreted uniformly with the other elements in COMP. Chomsky cites sentences like (23) as evidence for this restriction.

(23) John wondered whether Bill saw who.

wh R will be unable to apply in the derivation of a LF for (23) because the interpretation in COMP would not be uniform: whether is not a quantifying element and therefore cannot be interpreted in the same way as who. Furthermore, on the assumption that echo questions do not have a distinct representation at LF, Chomsky takes the fact that (23) is only interpretable as an echo question to support the analysis just outlined. (We discuss the status of (23) as an echo question in section 3.)

A related reason for placing this restriction on wh R concerns a possible ambiguity in the interpretation of true multiple wh constructions. It is noted both by Chomsky and by Baker (1970) that wh-in-situ in multiple wh questions have their scope determined by a higher wh phrase in COMP at S-structure (for discussion, cf. Hirschbühler (1981)). A sentence like (24a), therefore, exhibits possible ambiguity in the scope of the wh-in-situ, whereas (24b) does not.

(24a) Who knows where Mary bought what?  
   b: Who knows that Mary bought what?

Sentences like (25) pattern like (24b), even though they more superficially resemble (24a) under Chomsky's assumptions.

(25) Who did John ask whether Mary was planning what?

That is, if whether is a [+WH] phrase in COMP at S-structure, why is it that (25) can have only the interpretation (26a) and not also (26b)²

(26a) Wx, y (John asked x whether Mary was planning y)  
   b. Wx (John asked x (Wy (whether Mary was planning y)))
Chomsky suggests that by adopting the restriction that interpretation in COMP must be uniform, a wh-R analysis can accomodate the facts of (23)-(25).\(^9\)

Under the proposals of section 1, we can achieve a natural characterization of the "uniform interpretation in COMP" requirement. Notice that in both (23) and (25), what blocks embedded COMP scope for the wh-in-situ is whether. We have assumed that whether is [-WH] and we have further argued that it cannot appear in a [+WH] COMP. Suppose we now replace the requirement of uniform interpretation in COMP with a requirement that wh R can raise only to a [+WH] COMP. Our theory now accomodates (23) and (25), and in fact leads us to expect (25) to pattern like (24b) and not (24a). Furthermore, the requirement that wh R can raise only to a [+WH] COMP is natural in that it can be derived from our assumptions. Suppose wh R raised a [+WH] element to a [-WH] COMP. By the assumption of section 1, this configuration does not receive an interpretation. Therefore, wh R can raise only to a [+WH] COMP (cf. section 3).

This analysis can be shown to also account for the fact that (27) can mean only (28a) and not also (28b).

(27) Did John say who was planning what?

(28) a. Did John say (Wx, y (x was planning y))
    b. Wy (John said (Wx (x was planning y)))

As was observed in section 1, it follows from the [+WH] Filter that the matrix COMP of a sentence like (27) must be [-WH]. Under our analysis, then, wh R can derive only (28a), in line with the facts.

The [+WH] Filter, in conjunction with the results we have obtained, also entails that any application of wh R will involve movement to a filled COMP. Let us assume with AHS that wh R involves adjunction of a [+WH] element to COMP, as in (29).

(29) COMP
    [+wh]        COMP
    [wh-X]      [wh]
                     COMP
                     [wh-y]

As AHS note, assuming a structural characterization of the notion "scope" as in May (1977)\(^{10}\), (29) leads us falsely to expect differing relative scope possibilities for multiple wh phrases, as is standardly the case with multiple quantified phrases. For this reason, they adopt the rule of Absorption, which it may be assumed applies after wh R and prior to LF, performing the operation required to convert (29) to (30).

(30) COMP
    [+wh]        COMP
    [wh-X]      [wh-Y]

Since the two quasiquantifiers in (30) now c-command each other at LF, there is no prediction of differing relative scope possibilities with multiple wh phrases in a single COMP. Absorption is therefore assumed to be obligatory.

As Robert May points out to us, however, differing relative scopes of distinct instances of the same quantifier are in general truth conditionally equivalent, so that this argument for
AHS' use of Absorption is without force. Moreover, AHS cite Higginbotham and May (1980) in their adoption of the rule, but their use of Absorption is inconsistent with that of Higginbotham and May (1980); for one thing, AHS require Absorption to apply obligatorily, whereas in Higginbotham and May (1980), Absorption is crucially optional.

It must be noted that an additional reason that AHS adopt Absorption is to allow a natural characterization of the facts of (23)-(25), namely that Absorption requires some sort of "semantic parallelism" among the elements in COMP if it is to apply. Since whether apparently does not bear the appropriate semantic characteristics, Absorption cannot apply to a COMP that contains it, as in (23), (25). Given that Absorption is obligatory when more than a single element appears is COMP, the relevant LFs are excluded.

We maintain, however, that there is no need for a rule of Absorption of the type suggested by AHS, and as noted above, such a rule has no independent support. In our analysis, the facts of (23)-(25) follow from two assumptions, one of which we argued in favor of in section 1 - that whether is [-WH], and the other of which we will argue in favor of in the following section - that a [+WH] element in a [-WH] COMP at LF fails to receive an interpretation. From this it follows that wh R can effectively not raise a [+WH] element to a COMP filled with whether, and hence the facts of (23)-(25). We can thus dispense with the undefined notion of "semantic parallelism" given in AHS. In the terms of our analysis, "semantic parallelism" can be understood to refer to agreement of the feature [WH] on COMP and the elements contained in COMP.

AHS claim some support for their proposal to derive from the odd behavior of why. They suggest that the ungrammaticality of sentences like (31) can be captured by assuming that Absorption fails to apply with why, because why, like whether, does not bear the semantic characteristics required for the application of Absorption.


However, AHS falsely claim that the position of why in multiple wh constructions is irrelevant. For instance, compare the sentences in (32) with those in (31).

   b. Why did John leave when?

The sentences of (32) indicate clearly that Absorption must be allowed to apply with why, since they would otherwise only be possible as echo questions (cf. section 3). In the terms of our analysis, then, why must be [+WH].

It is unclear to us exactly what the restriction on why is. The speculation arises that for some reason, why must appear in COMP at S-structure if the sentence in question is to receive a nonecho interpretation. Contrary to appearances, sentences like (33) do not discredit this proposal.

(33) *Why didn't Bill tell Mary that who left?

It is argued in AHS that traces left by wh R obey the Empty Category Principle (ECP), as can be seen by considering the sentences of (34).

(34) a. Who remembers that Bill bought what?
   b. *Who remembers (that) who left?

In both cases, wh R can only move the wh-in-situ to the matrix COMP. The trace in the position of what in the LF of (34a) meets the ECP, but that in the position of who in the LF of (34b) does not. Returning now to (33), even though why appears in COMP at S-structure, the trace left by adjoining who by wh R to the matrix COMP fails to meet the ECP (cf. section 3 for further discussion). Let us therefore assume that the restriction on
the distribution of why in English is that it must appear in COMP at S-structure. If this is in fact the correct generalization, it can be accommodated in our system by assuming that why, like whether, if, that, is a complementizer, but that why is [+WH].

Let us now examine whether the facts of (32) pose any problem for our analysis of Absorption. These facts are correctly predicted, so long as why can be shown to be [+WH]. We will now demonstrate that under our assumptions, why must be [+WH]. Consider first the sentences in (35) and (36).

(35)  a. I doubt that he'll come.
      b. I doubt whether he'll come.

(36)  a. *I doubt what he might do.
      b. *I doubt why he might do it.

These sentences show that why behaves like a [+WH] phrase (what) rather than a [-WH] phrase (whether) in failing to satisfy the [-WH] subcategorization feature of a verb like doubt (cf. section 1). A similar observation holds of the sentences of (37) and the verb explain.

(37)  a. *John explained to us whether he was leaving (or not).
      b. John explained to us what he was doing.
      c. John explained to us why he was leaving.

In both cases, the assumption that why is [+WH] allows a straightforward description of the facts. Sentences like (38a), then, come as no surprise.

(38)  a. I wonder why they bought what.
      b. *I wonder whether they bought what.

In the S-structure of (38a), there is a filled [+WH] COMP for wh R to adjoin what to but not in (38b). Under our assumptions, only (38a) can be associated with a wellformed LF by wh R.

In sum, what we have argued in this section is that the assumption that whether is [-WH] makes possible a natural account of the "uniform interpretation in COMP" on wh R. We take the arguments and analyses of sections 1 and 2 to establish that it is possible to achieve a wide range of generalizations across apparently unrelated observations under the assumption that whether is [-WH] and that the feature [WH] is strictly speaking a syntactic feature.

3. Echo Questions

We return here to Chomsky's observation that (23) (repeated below) is only interpretable as an echo question.

(23) John wondered whether Bill saw who.

We will proceed from the assumption that echo questions have LFs essentially equivalent to their corresponding direct wh questions. For instance, with this assumption, (39a,b) are both interpreted roughly as (40), and (41a,b) as (42). (We adopt the convention that upper case letters signal the nuclear stress of a sentence intended to have the interpretation of an echo question. To facilitate judgements, we suggest that the relevant examples should also be pronounced with the intonation contour most typically associated with echo questions, although we agree with Culicover and Rochemont (1981) that echo questions need not be associated with a single intonation contour, nor is the typical echo intonation contour reserved for use solely with echo questions.)

(39)  a. John saw WHO?
      b. Who did John see?
(40) Wx (John saw x)

(41) a. What does John remember that Bill ate?
    b. John remembers that Bill ate WHAT?

(42) Wx (John remembers that Bill ate x)

We will refer to phrases like WHO in (39a) and WHAT in (41b) as echo wh phrases. Example (41b) suggests that an echo wh phrase always takes wide scope. For instance, (41b) does not have the interpretation (43).

(43) John remembers (Wx (Bill ate x))

Examples like (44) corroborate this generalization.

(44) John remembers who ate what.

(44) is in fact ambiguous between a multiple wh interpretation (i.e., as (45a)) and an echo question interpretation (i.e., as (45b) with the LF (45c)).

(45) a. John remembers (Wx, y (x ate y))
    b. John remembers who ate WHAT?
    c. Wy (John remembers (Wx (x ate y))

To see this more clearly, notice that (44), on a multiple wh interpretation, is not a request for a response, but as (45b), with echo intonation and stress on the wh-in-situ, it does require a response. The generalization in (46) suggests itself at this juncture.

(46) Any wh-in-situ can bear the stress nucleus of an echo question and is thereby assigned wide scope.

Notice that given the [+WH] filter, we must assume for each of (39a), (41b), and (45b) that the matrix COMP is [-WH]. Under our current assumptions, then, we cannot attribute the derivation of their respective LFs to the rule of wh R.

We argued in section 1 that wh R can in effect raise only to a [-WH] COMP, under the assumption that no interpretation is provided to a [-WH] element in a [-WH] COMP. Suppose we were to assume instead that a [+WH] element in a [-WH] COMP at LF receives the interpretation of an echo question. Several problems arise with this analysis. First, echo wh phrases always take wide scope, so that some stipulation would be required to prevent the derivation of (43) from the S-structure of (41b). Second, consider an echo question such as (47).

(47) Who told Bill that they bought what?

(47) need not have the interpretation of the corresponding multiple wh question (cf. (48)).

(48) Wx, y (x told Bill that they bought y)

Rather in (47), the wh-in-situ can be understood with wide scope, as in (49) (see note 8).

(49) Wy (Wx (x told Bill that they bought y))

This claim is brought out more clearly if we consider the possible appropriate responses to (47) under different interpretations. With the interpretation (48) (i.e., as a multiple wh question), (47) licenses responses such as the following: The Hintons told Bill that they bought the steaks, and the Palmers told Bill that they bought the potatoes. However, (47) with the interpretation (49) (i.e., as an echo question) licenses responses of a different type, as indicated in the following discourse.

A: Who told Bill that they bought WHAT?
B: (Who told Bill that they bought) the steaks.
(In the preceding case and in the examples of (50) and (52)-(54), we adopt the diacritic "\(\_\)" to signal simply nuclear stress, without the concomitant echo question interpretation and intonation which we associate with upper case letters.)

Apparently, then, there are certain exceptions to the claim of AHS, cited in section 2, that the relative order of quasi-operators at LF does not signal scope differences. Specifically, an echo \(\text{wh}\) phrase as a quantified expression is not interpreted as being within the domain of any other quasi-operator. The proposal that \(\text{wh R}\) is the rule responsible for deriving the LF's of echo questions would lead us to expect (47) to be associated with (48) rather than (49), even under an echo question interpretation, since assuming \(\text{wh R}\) to have adjoined the echo \(\text{wh}\) phrase to the matrix \([+\text{WH}]\) COMP would lead us to expect the relative order of the quasi-operators to be inconsequential to the interpretation.

A third difficulty with the \(\text{wh R}\) analysis is that it gives no natural basis for the correlation established in (46) between nuclear stress and wide scope. A \(\text{wh-in-situ}\) need not be stressed to be assigned scope, but notice that in a sentence like (50), in which \(\text{what}\) does not bear primary stress, it cannot be assigned wide scope.\(^{15}\)

(50) a. John can't remember what bought what for wh\(\_\).  
   b. John can't remember what bought what for Bill.

Finally, recall that in section 2 we cited AHS in showing that traces left by \(\text{wh R}\) obey the ECP. The offending sentence in our discussion there was (34b).

(34b) *Who remembers (that) who left.

(34b) is not actually ungrammatical (cf. note 12). It is fine as an echo question (cf. (51a)) with the LF (51b).

(51) a. Who remembers that WHO left?  
   b. Wy \(\langle Wx \ (x \text{remembers that} \ y \text{left}) \rangle\)  

Again, this is most clearly seen by considering what would count as an appropriate response to an echo question like (51a). For instance, consider Who remembers that Bill left? as a response to (51a). Since (51a) is grammatical as an echo question, it is evident that traces left by the rule raising echo \(\text{wh}\) phrases in LF do not obey the ECP.

We will now suggest an alternative analysis that does not rely on \(\text{wh R}\) to derive the LF's of echo questions and that overcomes all of the difficulties mentioned above. This analysis assumes the rule of Focus Assignment (FA) developed in Culicover and Rochemont (1981). FA, like \(\text{wh R}\) and Quantifier Raising (cf. May (1977)), is an interpretive rule applying in the derivation of logical representations to determine the scope domain of quantified phrases that appear in argument position in S-structure. For convenience, we will assume that FA applies in the derivation of LF, and not in the derivation of some later representation. (For an alternative use of this term, cf. Rochemont (forthcoming).) FA applies only to phrases that bear primary stress and is modelled on the operation of \(\lambda\) abstraction, except that the quantified phrase is marked for interpretation as focus. Consider the following examples:

(52) a. J\(\text{\^{o}}\)hn left.  
   b. J\(\text{\^{o}}\)hn\(\_\) (ej left)

(53) a. John rem\(\text{\^{e}}\)mbers Bill.  
   b. rem\(\text{\^{e}}\)mber\(\_\) (John ej Bill)

(54) a. Mary saw a m\(\text{\^{a}}\)n in a blue coat.  
   b. m\(\text{\^{a}}\)n\(\_\) (Mary saw a ej in a blue coat)
As (52)-(54) indicate, FA involves extraction of the stressed constituent and leaves behind a coindexed empty category of the appropriate syntactic type. There is some evidence that the empty category functions as a variable (cf. Chomsky (1976)), but this is tangential to our discussion here. A fuller treatment of FA, including rules specifying contextual conditions for the interpretation of focus can be found in Culicover and Rochemont (1981). We draw here freely from relevant portions of their analysis.

First, FA applies only to a constituent containing a nuclear stress. Second, FA is assumed to apply postcyclically. In effect, it is an operation of adjunction to a matrix $\hat{S}$. (52b), for example, is more explicitly represented as (55).

\[(55)\]

\[\begin{array}{c}
\hat{S} \\
\hline
\hat{S} \\
\hline
NP_1 \\
John \\
\hline
S \\
NP_1 \\
e \\
\hline
VP \\
left \\
\end{array}\]

In addition, applications of FA, unlike wh $R$, do not exhibit ECP effects. For instance, compare (56a, b) with (57a, b).

\[(56)\]

\[a.\ \text{John claims that someone shot Bill.} \]
\[b.\ \text{Bill (John claims that someone shot e)}\]

\[(57)\]

\[a.\ \text{John claims that Bill was shot.} \]
\[b.\ \text{Bill (John claims that e was shot)}\]

The reader can easily verify that the trace in subject position in (57b) violates the ECP (cf. note 13).

Given these observations concerning FA, we can propose a plausible analysis of echo questions without any of the adherent difficulties of the wh $R$ analysis if we assume that the LFs of echo questions are derived by FA. Since FA applies postcyclically, and only to constituents containing a nuclear stress, the generalization (46) follows as a natural consequence (cf. also note 9). Furthermore, we can now not only provide a natural explanation for why echo questions fail to obey the ECP, we can also accommodate the observation made in connection with (47) that echo wh phrases have wider scope than nonecho wh phrases which have scope over the matrix $\hat{S}$. Assuming that an echo wh phrase is raised by FA, it will appear in LF as a daughter of $\hat{S}$ not COMP. Given the definition of scope we assume (cf. note 10), it will always be the case that echo wh phrases will have wider scope than nonecho wh phrases, as can be seen in (58), the schematic representation of (49).
As a final point, let us consider the Superiority Condition of Chomsky (1973), reproduced in (59).

(59) No rule can involve $X$, $Y$ in the structure

\[
[ \ldots X \ldots [ \ldots Z - WYV \ldots ] \ldots ]
\]

where the rule applies ambiguously to $Z$ and to $Y$, and $Z$ is superior to $Y$. (cf. note 8).

The Superiority Condition is designed to prevent the derivation of a sentence like (60).

(60) John knows what who saw.

In (60), (59) functions to require $wh$ Movement to move the subject $wh$ phrase to COMP rather than the object $wh$ phrase, as in (61).

(61) John knows who saw what.

What is of interest to use here is that (60) is fully acceptable as an echo question, as in (62a), with the LF (62b).

(62) a. John knows what WHO saw?
   b. Wx (John knows (Wy (y saw x))

In recognition of this fact, we propose that the syntactic component should be permitted to generate (60). The Superiority Condition might then be viewed as a sufficient condition for the interpretation of a sentence as an echo question, as in (63).

(63) Given an S-structure $[\alpha \ldots \theta \ldots [\beta \ldots \gamma \ldots ] \ldots ]$, where $\gamma$ is in an A-position and $\theta$, $\gamma$ are $wh$ phrases, if $\gamma$ is superior to the trace of $\theta$ in $\alpha$, then $\alpha$ is an echo question.

We will now demonstrate that the generalization in (63) effectively follows from the analysis we have outlined. It is argued in AHS that the Superiority Condition can be seen as a consequence of the ECP. For instance, consider sentences (64).

(64) a. Who bought what?
   b. What did who buy?

In the derivation of a LF for (64b), $who$ is adjoined to COMP by $wh$ R but its trace is not properly governed. In particular, the empty category in subject position is not locally controlled by $who$ since in the configuration (65), $who$ does not govern the subject trace (even after Absorption).
A similar violation of the ECP does not arise in (64a), by the analysis of AHS, due to the application at S-structure of a rule of COMP indexing. This rule guarantees that the trace of a subject who phrase can be properly governed only if it appears as a trace in S-structure. In this way, the effects of the Superiority Condition evidenced in (60) and (64) are claimed to follow from the ECP.

Let us return now to (60). According to (63), (60) is necessarily an echo question (cf. (62a)), since it contains a who-in-situ at S-structure which is itself superior to the trace of a superior who phrase. This situation does not arise in sentences like (61). As we noted earlier, such sentences are actually ambiguous between a multiple who and an echo question interpretation. Why then is the multiple who interpretation excluded in (60)? As we have just seen, multiple who questions have their LFs provided by the rules of who Movement and who R, whereas echo questions have their LFs provided by FA. But who Movement and who R obey the ECP, while FA does not. Therefore, since the Superiority Condition follows from the ECP, any sentences in which Superiority is violated can only have the interpretations of echo questions. Hence, generalization (63).17

The preceding argument has one apparent flaw. Consider in this connection the following sentence, pointed out to us by Peter Culicover.

(66) What did John tell who that Bill liked?

(66) is assumed to have the S-structure (67).

(67) Whati did John tell who [ that Bill liked tj ]

In (67), who Movement has apparently violated the Superiority Condition. The fact that (66) is only interpretable as an echo question suggests strongly that (66) should be subsumed under the generalization (63). However, unlike (60) and (64b), (66) does not follow from the version of the ECP we have assumed here, nor does it follow from that given in Jaeggli (1980) nor Chomsky (1981). Therefore, to the extent that (66) cannot be shown to contain an ECP violation, there remains independent evidence for a Superiority Condition not subsumed by the ECP.18 We are quick to point out that this consequence does not severely affect our analysis. So long as we assume that FA is subject neither to the ECP nor to the residue of the Superiority Condition (as we must), there remains only one well-formed derivation of a LF for (66) -- as an echo question with FA on who.

The suggestion that the Superiority Condition is not subsumed by the ECP is supported by data from two other languages -- Spanish and Hebrew. Hebrew is like English in that it shows typical Superiority effects. Consider, for instance, the following sentences, provided by Hagit Borer.

(68) a. Dan raca la da'at mi kana ma.
    Dan wanted to know who bought what
    'Dan wanted to know who bought what.'

b. *Dan raca la da'at ma mi kana.
    'Dan wanted to know what who bought.'
Borer informs us that (68b), like the corresponding English sentence, is in fact not ungrammatical, but only interpretable as an echo question. Moreover, the Hebrew equivalent of (66) (cf. (69)) is also interpreted only as an echo question.

(69) ma Dan amar le-mi se-Gad kana?
    what Dan said to-who that-Gad bought
    'What did Dan tell who that Gad bought?'

Hebrew, then, like English, exhibits generalization (63) and offers independent support for the proposal that not all ECP Superiority effects are subsumed under the ECP.

In Spanish, the situation is somewhat more complex. Spanish is a pro-drop language, and, as noted by Jaeggli (1980), Spanish does not exhibit the typical English ECP effects -- i.e., subject-object asymmetries. In other words, in Spanish both of the sentences in (70) are grammatical on a multiple wh interpretation.

(70) a. ¿quién compró qué?
    who bought what
    'Who bought what?'

    b. ¿qué compró quién?
    what bought who
    'What did who buy?'

Jaeggli argues, however, that Spanish nevertheless exhibits ECP effects in other structural configurations. He suggests, for instance, that the ungrammaticality of sentence (71) can be attributed to the ECP, under the assumption that the clitic la absorbs government in a particular sense in the S-structure (72), thus leaving the trace of the preposed wh phrase not properly governed, hence in violation of the ECP.

(71) *¿a quién la viste?
    who him you-saw
    'Who did you see?'

(72) a quién la viste t

Jaeggli notes that the analysis can be extended to account also for the ungrammaticality of (73), assuming both an LF movement rule to prepose the wh-in-situ to COMP and that the ECP is a wellformedness condition on LF.

(73) *¿lo viste a quién?
    him you-saw who
    'Who did you see?'

Of interest to us is Jaeggli's observation (personal communication) that (73) is acceptable as an echo question. The assumption that the LFs of echo questions are derived by FA and hence are not subject to the ECP is supported by this observation. Moreover, the Spanish equivalent of our (66), given below in (74), is ungrammatical except as an echo question, suggesting once again that some version of generalization (63) has crosslinguistic validity.

(74) ¿qué le vió Juan a quién que Bill compró?
    what to-him said John to who that Bill bought
    'What did John tell who that Bill bought?'

(74) also provides additional evidence for maintaining a superiority condition in addition to the ECP.
In sum, the proposals we have advanced here for the analysis of English echo questions are supported by consideration of data from both Hebrew and Spanish. We hope in the preceding discussion to have shown that the syntax of echo questions is as amenable to systematic scrutiny as other grammatical constructions.

NOTES

1This paper was completed in May, 1982. It appears here virtually unchanged to facilitate its distribution and availability. The order of the authors' names is strictly alphabetical. We are indebted to Peter Culicover, Julia Horvath, Osvaldo Jaeggl, Robert May, and Jean-Roger Vergnaud for helpful comments on earlier versions.

1It will be noticed that in some instances the occurrence of whether is closely tied to the presence of affective conditioning elements in the embedding sentence. (8b), for example, is much improved if the matrix verb is negated or questioned, as in (i).

(i) a. John hasn’t told Bill whether Mary is planning a party.
   b. Has John told Bill whether Mary is planning a party?

Other verbs which pattern like tell in this respect are say, learn, know, be obvious. Describe, realize and suspect, however, do not exhibit such behaviour. Consider, for instance, (11) and the sentences of (ii).

(ii) a. *Did John describe to the class whether the exam would be easy or hard?
    b. *John didn’t describe to the class whether the exam would be easy or hard.
    c. *Nobody suspects whether Mary is leaving.
    d. *Does anybody suspect whether Mary is leaving?

An anonymous Linguistic Inquiry reviewer points out to us that affective environments are not the only factors influencing acceptability with such verbs as tell. Compare the following case with (8b).

(iii) John always used to call Bill and tell him whether Mary was planning a party.

It might well be the case that the oddness of such cases as (iii) is due to semantic considerations, as the reviewer suggests. Crucially, however, these considerations do not extend to describe, etc. In the absence of a specific proposal along these lines, we will ignore cases like (i) and (iii) for the purpose of our discussion, relying rather on an approach that systematizes at least some of the cases in question.

2We offer no satisfactory explanation for the grammaticality of (i), pointed out to us by Peter Culicover.

(i) The police are investigating why he killed her.

We are apparently forced to suggest that why is subcategorized (optionally) by investigate, in the same way we suggest if is subcategorized (cf. note 4).

3We will not be concerned here with the possible free relative reading of (17d); cf. Bresnan and Grimshaw (1978) for discussion. Notice that the subcategorization frame of investigate is apparently idiosyncratic, in that substitution of ask, research, or try to find out for investigate in (17) preserves grammaticality throughout.

4The distribution of if as opposed to whether, however, remains unaccounted for. A quick survey of the environments in which if can and cannot appear (cf. (i)) suggests that if must be subcategorized (and governed) by a [+V] element.

(i) a. *If John goes (or not) depends on his behaviour.
    b. *If he falls or not, I promise not to laugh.
    c. I'm not certain if I should leave.
    d. I wonder if I should leave.
    e. *It's unclear if he loves her (or not).
    f. *I'm doubtful if he'll do it.
    g. I doubt if he'll do it.
    h. *The question of if he should leave hasn't come up.

5We reject Filter (180) of Chomsky and Lasnik (1977) (cf. (i)).

(i) *[S COMP NP ...], where S is a root sentence.
On the assumption that matrix exclamatives are derived by *wh Movement without subsequent Inversion, (i) incorrectly excludes sentences like (ii).

(ii) What a fool John is!

6 A *wh-in-situ is defined in AHS as a *wh phrase which has not been subject to *wh Movement (i.e., is not in COMP at S-structure).

7 A (true) multiple *wh construction is one which contains a *wh-in-situ, \( \alpha \), which is c-commanded by a *wh phrase in COMP, \( \beta \), and \( \alpha \) is not superior to the trace of \( \beta \). (A node A is said to be superior to a node B if every major category dominating A dominates B as well, but not conversely; cf. Chomsky (1973)). This definition is meant to exclude not only cases like (23) but sentences like (i) as well.

(i) Who remembers what John bought?

8 The notation we adopt for expressing the LFs of questions is adapted from AHS. The string "\( W_x \)" is meant to abbreviate the phrase "for which \( x \), \( x \) a person or thing". For multiple *wh interpretations, we adopt the convention of using a single quasi-operator \( W \) to bind distinct variables when the *wh elements the variables are linked to have the same scope at LF.

9 Chomsky notes a further restriction on *wh R, that it can only apply to a *wh-in-situ, and not to *wh in COMP. For instance, (i) cannot have the interpretation (ii).

(ii) *Wx, y (x remembers that John bought y)

Within the GB framework (cf. Chomsky (1981)), it might be tempting to try to exclude the derivation of (ii) from the S-structure of (i) by appealing to either the ECP or the binding conditions to exclude the trace of the raised phrase in COMP. However, under the proposals of Chomsky (1981), traces in COMP are properly governed and thereby meet the ECP. Furthermore, as J.-R. Vergnaud has pointed out to us, a trace in COMP is neither PRO, nor a variable nor an anaphor, so that the binding conditions are possibly even irrelevant.

To accommodate this observation concerning sentences like (i), AHS suggest that the failure of *wh R to apply to phrases in nonargument positions might be seen as a particular instance of a more general constraint against applications of LF movement rules to elements in nonargument positions. In section 3, we will argue that *wh-in-situ with an echo question interpretation (as in (23)) have their LFs provided not by *wh R but by Focus Assignment (FA). If this view is correct, sentences like (iii) provide additional support for AHS’ proposal.

(iii) *Who wondered WHO Bill saw?

In (i), who cannot receive an echo question interpretation as it can in (23). Apparently, the application of FA to an element in COMP is blocked.

10 May (1977) proposes to define the scope of a quantifier as its c-command domain at LF.

11 AHS argue that French *pourquoi is similar to English *why in this respect. They cite the sentences in (i).

(i) a. *Tu as vu qui où?
b. *Tu as vu qui pourquoi?
c. *Quand a-t-il mangé pourquoi?

In our framework, the facts in (i) suggest treating *pourquoi like whether, that is, as *[-WH]. Under the assumption that Stylistic Inversion in French requires a [+WH] trigger (cf. Kayne and Pollock (1978)), the failure of *pourquoi to trigger Stylistic Inversion provides support for this proposal.

12 Sentences (31), (33), (34b), (38b) are not strictly speaking ungrammatical, even though they are starred. As we will show in section 3, our analysis predicts them to be good on an echo question interpretation.

13 We adopt the following definition of the ECP.

(i) *NP e must be properly governed.

\( \alpha \) is said to properly govern \( \beta \) if

(a) \( \alpha \) governs \( \beta \), and

(b) either \( \beta \) is coindexed with \( \alpha \) or \( \alpha \) = [±V, ±N].

We adopt essentially the definition of government of Rouveret and Vergnaud (1980) (cf. also Jaeggli (1980)): \( \alpha \) governs \( \beta \) if and only if \( \alpha \) c-commands \( \beta \) and either \( \beta \) or the domain of \( \beta \) c-commands \( \alpha \).

14 As E. Matthei has observed, the fact that a sentence like (i) remains interpretable as an echo question is problematic for the analysis of *why as a complementizer.
15 cf. Culicover and Rochemont (1981) and Rochemont (forthcoming) for an analysis of sentence final nuclear stress as in (50) under which FA is argued not to apply in the derivation of the appropriate LF.

16 An alternative analysis of the ECP with similar effect is presented in Jaeggli (1980) and Chomsky (1981).

17 French exhibits ECP violations even though it does not appear to maintain the generalization (63) (cf. AHS). If generalization (63) follows from the ECP and the analysis of why R as involving effectively only movement to (+WH) COMP, then we would expect it to hold universally. In light of the discussion to follow in the text, any possible existing differences between languages with respect to echo questions might be tied to parameterization of (the remnants of) the Superiority Condition. We will not pursue this possibility further here.

18 Robert May points out to us that (66) may indeed be seen to follow from the ECP if we make the assumption that a proper governor can properly govern at most one empty category. If this is the case, then what we refer to as the residue of the Superiority Condition will follow from this modification of the ECP. We will not pursue this suggestion.

19 Jaeggli (1980) observes in a footnote that clitic doubled objects in focus "constructions" are not fully acceptable, as in (i).

(i) ?? Lo vi a JUAN.
    him we saw Juan
    "We saw JOHN."

We offer no explanation here for the failure of (i) to be fully grammatical.

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