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DISCOURSE-LINKING AND THE WH-ISLAND CONSTRAINT *

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This paper considers the role discourse-linking plays with respect to questioning out of wh-complements. The paper offers a unified explanation for why only discourse-linked wh-phrases (e.g. *which*) 1) can be extracted from indirect questions in languages that have syntactic wh-movement and 2) can take scope out of indirect questions in languages that allow only wh-in-situ.

1. On the so-called asymmetry with respect to wh-islands

The existence of an asymmetry between questioning and relativizing out of indirect questions was first recognized by Maling (1978) and Rizzi (1978).

Maling's research was based on the Germanic languages of Scandinavia, a group of languages that allow extraction from wh-complements. Maling concluded that fronting out of indirect questions is possible only by relativization, not also by questioning.

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Extraction from indirect questions is also possible in Romance. In some of these languages, the fact that Subjacency does not block such extractions is due to the choice of S' as a bounding node; this is the case of Italian, French, and Spanish, as shown by Rizzi (1978), Sportiche (1982), and Torrego (1984) respectively.¹ In Comorovski (1986), I have shown that Romanian allows unlimited extractions from wh-complements. This unusual freedom of extraction is due to the fact that Romanian allows long-distance fronting of several wh-phrases to the same COMP; the possibility of having multiply-filled COMPs in turn opens up the possibility of extraction from wh-complements without violating Subjacency.

There is an asymmetry between questioning and relativization out of indirect questions in Romance too. Rizzi (1978), for instance, draws the conclusion that in Italian it is possible only to relativize, not also to question out of wh-complements - a conclusion identical to the one

¹ The LGB model permits a simple parametrization of Subjacency by setting S or S' (or both) as bounding nodes. As a result, the variation from language to language in the possibilities of extraction from indirect questions can be elegantly accounted for. No such result can be achieved in the *Barriers* model. In this model, extraction out of a *that*-complement is possible only if the extracted constituent is adjoined to the VP of the higher clause before moving to the Spec of CP position:

- (i) [_{CP₂} ^{wh} [_{IP₂} ... [_{VP} t' [_{VP} ... [_{CP₁} t' [_{IP₁} ... t ...]]]]]]]

Otherwise, in violation of Subjacency, the extracted constituent would cross two barriers, namely CP₁ and IP₂, before landing in the Spec of CP position of the higher clause. But how would the absence of wh-island effects in languages like French, Italian, and Spanish be handled in this model? As far as I can see, in order to obtain the result that CP is not a barrier and hence extraction out of wh-complements is possible without more than one barrier being crossed, it would be necessary to stipulate that, in these languages, the definition of a barrier does not apply uniformly to all categories. One way of implementing this result would be to stipulate that, in French, Italian, and Spanish, CP does not inherit barrierhood. Unless barrierhood inheritance is regarded as a parameter of UG, the approach sketched above cannot rival the elegance of the solution put forward by authors working within the LGB model.

reached by Maling (1978) for Scandinavian. Rizzi attributes the impossibility of questioning out of indirect questions in Italian to the fact that Italian has a general prohibition against any kind of multiple questions. Rizzi seems to suggest that the grammar of Italian cannot generate the D-structure of a sentence with two interrogative NPs. If so, then Subjacency can be held to constrain relative and interrogative pronouns uniformly: in Italian, Subjacency simply does not have any structure containing two interrogative wh-phrases on which to operate.

However, Calabrese (1984) shows that the ban on multiple constituent questions in Italian need not be attributed to the syntax. Calabrese elegantly accounts for the prohibition against multiple questions in Italian by a language specific stress assignment rule which is independently motivated. This rule explains the impossibility not only of multiple questions, but also of sentences containing two contrastively stressed NPs, i.e. sentences that have the typical form of an answer to a multiple constituent question. For instance, corresponding to the unacceptable question in (1), there is the unacceptable declarative in (2):

- (1) * Chi è partito quando?
 who is left when
 'Who left when?'
- (2) * FRANCO è partito alle CINQUE.
 Franco is left at five
 'Franco left at five.'

Since sentences resulting from extraction out of a wh-complement are not multiple, but single direct questions, they cannot be ruled out by Calabrese's stress assignment rule. But given Calabrese's explanation of the unacceptability of Italian multiple questions, the limitation Rizzi places on the number of interrogative wh-phrases that can occur in an Italian sentence becomes an ad-hoc stipulation.

Neither in Romance nor in Scandinavian is the right partitioning of the data the one proposed by Rizzi and Maling. In a footnote, Rizzi (1978) in fact recognizes the possibility of questioning out of indirect questions in Italian. He links the acceptability of such extractions to the relative "heaviness" of the extracted wh-phrase. Rizzi offers no

explanation for why heaviness should make a difference. Here are Rizzi's examples:

- (3) a. ?? A chi non ti ricordi quanti soldi hai dato?
 'To whom don't you remember how much money you gave?'
 b. A quale dei tuoi figli non ti ricordi quanti soldi hai dato?
 'To which one of your sons don't you remember how much money you gave?'

Notice that the extracted wh-phrase in the grammatical sentence (3b) is unambiguously discourse-linked. For the moment, I will use the term 'discourse-linked' (hence D-linked) in the sense of Pesetsky's (1987), who characterizes D-linked wh-phrases as being those wh-phrases whose range of felicitous answers is limited by a contextually defined set.

Engdahl (1979, 1980) exemplifies the possibility of questioning out of wh-complements in Swedish. Engdahl (1979) singles out relative "weight" as the feature characterizing interrogative wh-phrases that can be extracted from wh-complements; her observation is similar to Rizzi's. Here is a relevant contrast:

- (4) a. *Vad visste ingen vem som skrev? (Maling (1978: 84))
 'What does no one know who wrote?'
 b. Sven undrar vilken bok alla studenter minns vilken författare som skrev. (Engdahl (1980): 65)
 'Sven wonders which book all students remember which author wrote.'

All the examples Engdahl gives involve extraction of a D-linked wh-phrase.

Bulgarian, another language where the wh-island constraint does not hold, also has been claimed to show an asymmetry between questioning and relativization (Rudin (1981), (1986)). However, Bedzyk (1987) shows that, in Bulgarian too, questioning out of a wh-complement is possible if the extracted wh-phrase is D-linked:

- (5) a. [Koj_j [e_j e pokanil e_i]]]]
 { ot studentkite_i
 which { student (fem.) not know-2s. who is invited
 { of students-the (fem.)
 'Which student/of the students don't you know who invited?'
- b. * [Kakvo_i [ne znaeš [koj_j [e_j e vidjal e_i]]]] ?
 what neg know-2s. who is seen

In Comorovski (1985), I have shown that, in Romanian, questioning out of wh-complements gives grammatical results only if the extracted wh-phrase is D-linked. This fact about extraction in Romanian is illustrated below:

- (6) a. [Despre { care_i [S { tii [cine_j [S e_j i - a povestit e_i]]]]] ?
 b. { * ce_i
 About { which_i you-know who_j e_j to-him has told e_i
 { what
 'Which one do you know who told him about?'

The cross-linguistic generalization that emerges is that only D-linked wh-phrases can be questioned out of indirect questions. Thus long-distance movement of non-D-linked wh-phrases may at first sight appear to be constrained by a syntactic condition distinct from Subjacency. Such a conclusion is, however, hardly tenable, given the fact that there is not one distinction in the internal structure or the distribution of D-linked versus non-D-linked wh-phrases that would justify their being subject to different syntactic conditions. It is important to note that D-linking is not necessarily an inherent feature of a wh-NP, as in the case of *which*-NPs. For wh-phrases other than *which*-phrases (e.g. *who*, *what*, *where*, *when*), it is the context of utterance, and not the form of the wh-phrases, that determines whether they are D-linked or not.

Note also that, as soon as a question that has resulted from the fronting of a non-D-linked wh-phrase out of a wh-complement receives echo question intonation, the unacceptability disappears. As is well known, echo wh-phrases obligatorily take widest scope (see, e.g.,

Karttunen (1977: fn.7)). The fact that a string becomes acceptable when one of its constituents changes its scope-taking properties strongly suggests that the unacceptability is due to semantic/pragmatic, rather than syntactic factors.

Before examining these factors, let us take a closer look at the conditions that have to obtain for the utterance of a question containing a D-linked *wh*-phrase to be felicitous.

2. Inherently discourse-linked *wh*-phrases

Consider the following exchanges:

(7) Speaker A: This year, we have ten new students.

Speaker B: a. Have you invited them to your party?

b. Why don't you invite a few of them to your party?

c. Which *of* them have you invited to your party?

lones

Speaker A: a. Yes, I have.

b. Oh, I will.

c. # Karen and Roy.

(The '#' sign marks infelicity as an answer.) Speaker B's use of an anaphoric pronoun in the first question shows that a plural discourse referent has been introduced by the use of the NP *ten new students* in speaker A's statement. Speaker B's second and third questions show that a pronoun referring to the same plural discourse referent can function as the definite NP in the *of*-phrase of a partitive.

The infelicity of speaker A's third answer shows that the set represented by an already introduced plural discourse referent can serve as an argument to *which* only under certain discourse circumstances. In (7), for speaker A's third answer to be uttered felicitously, speaker B has to know the membership of the set of ten new students. That he does not know it is indicated by speaker A's first utterance, where the set is introduced as new.

The felicity condition on the use of a *which*-NP is that the participants in the conversation achieve identical exhaustive

partitionings of the set that *which* takes as an argument. This condition can be met only if the participants know the membership of the set or if they share some criterion of classification according to which they partition the set. In the above dialogue, for instance, this criterion could be the students' country of origin, in which case the answer expected to speaker B's third question is an enumeration of sets of students grouped by country. A possible answer may then be *The Finnish students and the Polish students*. Partitioning the set that *which* takes as an argument according to some commonly known attribute is needed only when the individuals in the set are not known directly (i.e. they are known "by description", not "by acquaintance"). In case the set membership is known, it is possible to build extensionally any partition, the partition into singletons being the maximal one. In our example, only then would an enumeration of the new students invited to the party be a felicitous answer to speaker B's third question.

3. Question-embedding verbs

The nature of the matrix verb makes a difference in the acceptability of a question resulting from extraction out of a wh-complement:

(8) a. Pe care (dintre studenții noi)_i știi /știe Ana

b. ? i-a spus (Ana)

c. *te întrebi

cine anume_j e_j l_i-a invitat e_i?

prep.which (of students-the new) ș you-know/knows Ann

(Acc.) to-you has told (Ann)

{you-wonder

who exactly him has invited

'Which one (of the new students)_i ș do you/ does Ann know

did she/Ann tell you

{ do you wonder

who exactly_j e_j invited e_i?'

Only the verbs that Groenendijk and Stokhof (1982) have called *extensional* question-embedding verbs allow questioning out of their

wh-complement. In contrast, *intensional* question-embedding verbs do not allow such extractions, unless the extracted phrase is an echo wh-phrase.

Groenendijk and Stokhof (1982) set up the distinction between extensional and intensional question-embedding verbs on the basis of the different behaviour of verbs with respect to a certain inference pattern: an argument of which one of the premises contains a wh-complement and the conclusion a *that*- complement:

- (9) John knows *whether* Mary smokes (/doesn't smoke).
 Mary smokes (/doesn't smoke)
-

John knows *that* Mary smokes (/doesn't smoke).

Groenendijk and Stokhof point out that the validity of (9) does not depend on the factivity of *know*, since the argument remains valid if *know* is replaced by a non-factive verb such as *tell*:

- (10) John told Bill *whether* Mary smokes (/doesn't smoke).
 Mary smokes (/doesn't smoke).
-

John told Bill *that* Mary smokes (/doesn't smoke).

Since 'x tells that ϕ ' does not imply that ϕ is true, the validity of (10) cannot be accounted for in terms of factivity. If a uniform account is to be given for the validity of the arguments in (9) and (10), the validity of (9) should not be explained in terms of factivity either.

Groenendijk and Stokhof (1982) observe that arguments of the kind illustrated in (9)-(10) are not valid if the verb in the first premise is replaced by *estimate* or *guess* (in the sense of 'make a guess', not of 'guess right'). They propose that the criterion for drawing a distinction between those question-embedding verbs that make such arguments valid and those that do not is the type of semantic object that the verb takes as an argument: verbs such as *know* and *tell* operate on the denotation of their wh-complements (which for Groenendijk and Stokhof is a proposition); verbs like *estimate* operate on the sense of their complements (i.e. on propositional concepts). Groenendijk and

Stokhof label the verbs in the first class *extensional* and those in the second class *intensional*.² They assimilate verbs like *wonder*, which do not take a *that*-complement, to the latter class.

In sum, there are two factors that determine the acceptability of questioning out of an indirect questions: the D-linking of the extracted wh-phrase and the extensionality of the matrix verb.³

4. The presuppositions of questions resulting from extraction out of a wh-complement

Let us now take a closer look at the questions in (8). The question in (8a) pragmatically presupposes that more than one student was invited and that all the students in the set that *which* ranges over were invited. So the question in (8a) pragmatically presupposes (11) and (12) (where 'S' represents the set of new students and 'P' the set of human beings):

$$(11) (\exists > 1x) (\exists y) (x \in S \wedge y \in P \wedge \text{invited}(y, x))$$

$$(12) (\forall x) (x \in S \rightarrow (\exists y)(y \in P \wedge \text{invited}(y, x)))$$

The existence of the presuppositions in (11) and (12) can be illustrated

² Groenendijk and Stokhof warn against the possible terminological confusion that may arise: a verb such as *know* is extensional in the sense that it takes the denotation of its complement as an argument, but is intensional in the traditional sense, since the denotation of a complement is an intensional object - a proposition.

³ Interestingly, Ross (1973) observed that, in English, only certain question-embedding verbs allow a wh-in-situ in their wh-complement to take scope outside the wh-island. Thus, according to Ross, *remember* and *know* allow wide scope of an embedded wh-in-situ, whereas *wonder*, *inquire*, and *want to know* do not. The verbs that Ross enumerates fall precisely in the categories of extensional and intensional question-embedding verbs respectively. However, negated extensional question-embedding verbs do not allow wide scope of the wh-in-situ. Two of Ross's examples are reproduced below. According to him, only the wh-in-situ in (i), not also that in (ii), can take wide scope:

(i) Who remembers where John bought which books?

(ii) Who wonders where John bought which books?

by the anomaly of a discourse consisting in a denial of (11) and/or (12) followed by the question in (8a):

(13) a. # Știu că numai unul dintre studenți a fost invitat, dar pe care știi cine anume l-a invitat?

'I know that only one of the students was invited, but which one do you know who exactly invited?'

b. ?# Știu că nu toți cei 20 de studenți au fost invitați, dar pe care dintre cei 20 de studenți știi cine anume i-a invitat?

'I know that not all of the 20 students were invited, but which of the 20 students do you know who exactly invited?'⁴

How do the presuppositions in (11-12) arise? Any wh-question of the form 'who ϕ s' pragmatically presupposes 'I don't know who ϕ s', which pragmatically presupposes that there is more than one individual who possibly ϕ s. (If there were only one individual, I would ask instead: 'Does John ϕ ?'). Thus, question (8a) pragmatically presupposes (14), where ' \Diamond ' stands for 'possibly, for all I know':

(14) $(\exists > 1x) (x \in S \wedge \Diamond \text{Ann knows who invited } x)$

Likewise, a wh-question of the form 'who ϕ s' pragmatically presupposes that *every* individual in the set over which *who* ranges possibly ϕ s. This latter presupposition reflects the speaker's domain selection: the domain is restricted by excluding individuals for which $\sim\phi$ holds. The pragmatic presupposition that any of the individuals over which *who* ranges may or may not ϕ is an expression of the speaker's uncertainty, his lack of information, which is one of the conditions that make the utterance of a question felicitous. Thus, the question (8a) also pragmatically presupposes (15):

⁴ Barbara Partee pointed out to me that, if the partitive phrase of *the 20 students* is not repeated after *which*, it may be possible to get a non-contradictory interpretation of the question in (13b) by accommodating a subset of the 20 students.

(15) $(\forall x) (x \in S \rightarrow \diamond \text{Ann knows who invited } x)$

So our task now is to get from (14/15) to (11/12) respectively.

The first step is to show that extensional question-embedding verbs are transparent to the implicatures of their complements; in the case under consideration, to the existential implicature of a *wh*-complement.⁵ In other words, we have to show that any sentence of the form '*x* knows/tells who ϕ s' presupposes that there is somebody who ϕ s. To show this, I follow Karttunen (1977) in taking a question to denote a set of propositions, namely the set of all its true answers. I will use a meaning postulate relating *know/tell wh* to *know/tell that* (cf. Karttunen (1977: fn. 11)):

(16) MP $\text{know}_{IV/Q} : \Box (\forall x)(\forall q) [\text{know}'_{IV/Q} (x, q) \rightarrow ((\exists p)q(p) \wedge (\forall p)(q(p) \rightarrow \text{know}'_t(x, p)))]$

' $\text{know}_{IV/Q}$ ' stands for the question-embedding verb *know*, and ' know'_t ' for its *that*-clause embedding counterpart; q is a variable over sets of propositions (=questions), and p a variable over propositions. The meaning postulate above has the effect of making 'Ann knows q ' true just in case q has at least one true answer and Ann knows *every* true answer to q . Note that the meaning postulate in (16) guarantees that the verbs to which it applies yield a valid argument if used in inferences of the kind illustrated in (9/10).⁶

⁵ See Karttunen and Peters (1976: 362-3) for one way of achieving this result with *know*.

⁶ It may be a matter of debate whether the meaning postulate in (16) applies only to *know*, or it also applies to *tell*. If it did hold of *tell*, (i) could not be followed by (ii) without contradiction; however, I think that (i) can be followed by (ii) with at most a mild contradictory flavour:

(i) Bill told Sue who was invited at the anniversary.

(ii) a. but he was not well-informed, so he didn't tell her that Herb was among those invited.

b. but he forgot to tell her that Herb was among those invited.

In contrast, (iiia) cannot be followed by (iiib) without contradiction:

We can now get from (14/15) to (11/12). For any value of x , (18) follows from (17) and $MPknow_{IV/Q}$, and (19) follows from the existential implicature of wh-questions:

$$(17) \text{know}'_{IV/Q}(a, \text{|| who invited } x \text{ ||})$$

$$(18) (\exists p)(\text{|| who invited } x \text{ ||}(p)) \wedge (\forall p)(\text{|| who invited } x \text{ ||}(p) \rightarrow \text{know}'_t(a, p))$$

$$(19) (\exists p)(\text{|| who invited } x \text{ ||}(p)) \rightarrow (\exists y)(P(y) \wedge \text{invited}(y, x))$$

From (18) and (19) we get:

$$(20) (\exists y)(P(y) \wedge \text{invited}(y, x))$$

Thus, for any value of x , a sentence of the form 'Ann knows who invited x ' pragmatically presupposes (20). The possibility operator lets the presuppositions of the sentence it is prefixed to go through (see, for instance, the discussion in Gazdar (1979: 111f.)). Given the transparency of the possibility operator, we get for any x :

$$(21) '\diamond \text{Ann knows who invited } x' \text{ presupposes } '(\exists y)(P(y) \wedge \text{invited}(y, x))'$$

Since ' \diamond Ann knows who invited x ' holds of more than one value of x (cf. 14), ' $(\exists y)(P(y) \wedge \text{invited}(y, x))$ ' will also hold of more than one value of x . Likewise, since ' \diamond Ann knows who invited x ' holds of every

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- (iii) a. Bill knows who was invited at the anniversary.
 b. but he is not well-informed, so he does not know that Herb is among those invited.

The unclear status of *tell* with respect to the meaning postulate in (16) may be responsible for the fact that (8b), with *tell* as a matrix verb, is slightly marginal, whereas (8a), with *know* as a matrix verb, is fully acceptable.

value of x (cf. 15), ' $(\exists y)(P(y) \wedge \text{invited}(y, x))$ ' will also hold of every value of x . We have arrived here at the presuppositions of the sentences in (14-15); (14-15) are the presuppositions of the question in (8a). It appears to generally be the case that if a sentence p presupposes a sentence q , p will also presuppose the presuppositions of q .⁷ Thus the presuppositions of (14-15) will be also the presuppositions of (8a). And indeed, we have already seen that (8a) presupposes that more than one student was invited and that every student in the set that *which* ranges over was invited (= 11/12).

5. A felicity condition on questions

I propose the following simple and intuitively plausible felicity condition:

- (22) A question is felicitous only if the hearer can check the truth of its presupposition(s).

(22) says that for a question to be felicitous, the hearer must be able to do something other than just question the truth of its presupposition. Take, for instance, the existential presupposition of a wh-question. If the hearer can check its truth, he is in principle able to give three types of answers, as illustrated in (23):

- (23) Q: Who came?
 A1: Nobody
 A2: Sam (and Tom).
 A3: I don 't know.

If the existential presupposition is false, the truthful answer will be A1 - a denial of the presupposition. If the existential presupposition is true, the answer could be A2 - an enumeration of the objects that satisfy the

⁷ For instance, *John knows that the king of France is bald* presupposes *The king of France is bald*, which in turn presupposes that there is a king of France. *John knows that the king of France is bald* too presupposes that there is a king of France.

open sentence resulting from the substitution of the *wh*-phrase by a variable; or it could be A3 - a declaration of ignorance, i.e. of the hearer's inability to pick the objects that satisfy the open sentence. If the hearer is not able to check the truth of the presupposition, all he can do is express his doubt as to whether the presupposition holds; an appropriate reply to the question in (23) would then be, for instance, *I'm not sure that anyone came*.

There are certain questions whose very form (i.e. syntactic structure and/or choice of lexical items) makes it impossible for the hearer to check the truth of their presupposition. Such questions will not satisfy the felicity condition (22) irrespective of the context in which they are uttered. Question-forms which only allow as an answer an expression of doubt as to whether or not their presupposition holds defeat the very purpose of the interrogative speech act, i.e. to elicit information unknown to the speaker. If the speaker knows that, by the very form of his question, the only possible reply he can expect is a questioning of the presupposition of his utterance, the answer cannot bring him any information that he does not already have. I suggest to rule out as unacceptable questions which, because of their very form, cannot have their presupposition(s) checked and hence cannot be used to elicit informative answers.^{8,9}

At least one of the presuppositions of questions formed by fronting a

⁸ My suggestion regarding the unacceptability of questions that cannot be given an informative answer is perfectly parallel to Barwise and Cooper's (1981) proposal to rule out sentences of the form *there be Det CN*, where the determiner is strong, on the ground of being uninformative.

⁹ Questions whose presupposition(s) cannot be checked are different from rhetorical questions, which are acceptable although they are never used to elicit an informative answer. Rhetorical questions have assertive, rather than interrogative force. Carlson (1983: 128) suggests that the utterance of a rhetorical question is not an interrogation, but rather a denial of the presupposition of that question. For instance, the denotation of (i) uttered as a rhetorical question is equivalent to the proposition expressed by the sentence that denies the presupposition of (i), namely (ii):

- (i) And you ended up with what?
- (ii) We ended up with nothing.

non-D-linked wh-phrase out of an indirect question cannot be checked. Take, for instance, (24):

- (24) a. *Ce_i pro ştii cine_j e_j a distrus e_i?
 what you-know who has destroyed

Since in (24) the extracted wh-phrase is not D-linked, so that the membership of the set over which it quantifies is unknown, it is impossible to determine whether the presupposition ' $(\forall x)(\text{thing } (x) \rightarrow (\exists y) (\text{person}(y) \wedge \text{destroy } (y, x)))$ ' of the question is or not satisfied. Therefore, the question in (24) violates the felicity condition in (22), and so its utterance cannot elicit information unknown to the speaker. I suggest ruling out questions resulting from the extraction of a non-D-linked wh-phrase out of a wh-complement on the ground of their inability to request information that the speaker does not already have.

Suppose the question in (24) were answered by something other than an expression of doubt as to the truth of the presupposition of the question. Suppose the hearer answers (*I know who destroyed*) *Babylon*. Since the hearer neither denies nor questions the presupposition of (24) that everything was destroyed, by answering to (24) (*I know who destroyed*) *Babylon*, the speaker implicates that he does not know who destroyed the other things. This in turn implicates that the other things were destroyed. But if the hearer does not know what the things are, he cannot determine whether everything was or not destroyed. Therefore, the answer *Babylon* to question (24) has an implicature whose truth-value the hearer cannot determine. Thus, an answer to a question of the form in (24) (other than an expression of doubt as to the presupposition of the question) will implicate that the hearer has determined the truth of a sentence whose truth-value in fact he cannot establish.

6. Echo Questions

As pointed out in section I, the result of extracting any echo wh-phrase from an indirect question is acceptable. Why should this be so?

To represent the metalinguistic character of first order echo

questions ^{10, 11}, I will introduce two metalinguistic constants: a primitive relation 'A' and an individual constant 'c' standing for the context of utterance. We can think of 'A' as the assertion relation, a relation of type $\langle \langle s, t \rangle, e \rangle$, holding between a proposition and its context. Given the new constants 'A' and 'c', first order echo questions can be represented as in (25). I represent the wh-NPs as being existentially quantified, as in Karttunen (1977):

- (25) Monica likes *whát*? (echo question - first order)
 $\lambda p \exists x [A(p, c) \wedge p = \hat{L}_*(m, \tilde{x})]$

'A(p, c)' reads as 'p has been *asserted* in the context earlier'. Note that truth plays no role in defining the denotation of an echo question, which denotes a set of *asserted* propositions. This type of denotation adequately reflects the metalinguistic character of echo questions.

Given the representation of echo questions proposed above, we can correctly predict that an echo question formed by extraction of an echo wh-phrase from a wh-complement obeys the felicity condition in (22). Note first that, when read with echo question intonation, (8a) does not implicate (11/12). Since it is the implicatures in (11/12) that would make (8a) unacceptable if the extracted wh-phrase were not D-linked, it is their absence that explains why a corresponding echo question is always acceptable.

Why are the pragmatic presuppositions in (11/12) absent? In deriving them, we have used the meaning postulate in (16). This meaning postulate can be made use of only if a proposition expressed by a sentence of the form 'know_{IV/Q}(x, q)' is *true*, and not if it is merely *asserted*; but what we get with echo questions is precisely a proposition that is asserted, but not necessarily true. Since we cannot

¹⁰ As opposed to what Karttunen (1977: fn. 7) calls "second order questions", i.e. echo wh-questions requesting as an answer a non-echo question, as, for instance, in (i):

- (i) Speaker A: Who bought the canoe?
 Speaker B: Who bought *whát*?
 Speaker A: (Who bought) the canoe?

¹¹ For details on the semantics and pragmatics of echo questions, see Comorovski (1988).

make use of $MPknow_{IV/Q}$, we cannot derive the presuppositions in (11/12), and so we correctly predict that echo question (8a), unlike standard question (8a), does not carry those presuppositions. The absence of presuppositions of the form in (11/12) with echo questions explains why a question resulting from the extraction of an echo wh-phrase from a wh-complement will always be acceptable.

7. Discourse-linking and wh-in situ

Interestingly, the effect that D-linking has on the acceptability of questions resulting from extraction out of a wh-complement parallels the consequences it has on wh-island effects in Japanese, a language that only allows wh-in-situ. In Japanese, only non-D-linked wh-phrases show wh-island effects, as pointed out by Nishigauchi (1986); below is one of his examples from Japanese:

- (26) a. Inoue-sensei to, Katoo-sensei to, Satoo-sensei no nakade,
 prof. and prof. and prof. of among
 John-wa [dono sensei-ga dono computer-o o-moti ka]
 Top. which prof. Nom. which Acc. have -Q
 oboe-te-iru-no-desu-ka?
 remember is that is -Q
 'Among professors Inoue, Kato, and Sato, for which x, professor
 x, does John remember [for which y, computer y, x has y] ?'
- b. John-wa [*ittai* dono sensei-ga dono computer-o o-moti ka]
 Top. the-hell which prof. Nom. which Acc. have -Q
 oboe-te-i-masu-ka ?
 remember is -Q
 'Does John remember which professor the hell has which
 computer?'

As Nishigauchi points out, the expression *ittai* ('the hell') forces a non-D-linked interpretation on the wh-NP *dono sensei* in (26b). To explain why in (26b) *dono sensei* cannot take scope over the matrix verb, thus in effect taking scope over a wh-island, Nishigauchi adopts Pesetsky's (1987) suggestion concerning wh-scope assignment: D-linked wh-phrases are assigned scope by coindexing with the COMP of the clause over which they take scope (a mechanism of scope-assignment

first proposed by Baker (1970)); non-D-linked wh-phrases are assigned scope by LF-movement. Nishigauchi concludes that Subjacency blocks the LF-movement of the non-D-linked wh-phrase *dono sensei* that would result in the interpretation of (26b) on which *dono sensei* takes scope over the matrix verb.

The explanation offered in this paper for the effect D-linking has on sentences involving wh-islands makes no reference to the position in which the wh-phrases occur at S-structure. Therefore, this explanation can be naturally extended to languages like Japanese, where wh-phrases have to stay in situ. Note that an explanation in terms of LF-movement, like the one proposed by Nishigauchi (1986), cannot be extended to the languages we considered in section I: all the sentences examined there are derived by *syntactic* wh-fronting. Thus, the approach taken in this paper has the advantage of offering a uniform explanation for related island effects in languages with strikingly different syntactic structures of wh-questions.

I do not know for the moment why extraction out of complements to intensional question-embedding verbs is forbidden for both D-linked and non-D-linked wh-phrases. It is with respect to the intensionality of the matrix verb that there seems to be a genuine asymmetry between questioning and relativization out of wh-complements: unlike the former, the latter can occur freely. This issue, however, I leave for further research.

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