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Different Strategies for Eliminating Barriers

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DIFFERENT STRATEGIES FOR ELIMINATING BARRIERS

1. Let me start by assuming that crossing one barrier has bad consequences at least for the Subadjacency condition.¹ Assume also a notion maximal projection which is a slight modification of the one introduced in Fukui and Speas (1986), namely (1):

- (1) Where A is a functional category, A is a maximal projection only if A has a lexical specifier.

By functional projection I will mean Comp, Infl, etc. There is a rather natural way of actually deducing why the specifier in (1) is lexical, as in Laka and Uriagereka (1987), but I will not concentrate on this now.² Further, I will assume, minimally, that barrier can be characterized as follows (from Chomsky (1986b)):

- (2) A is a barrier only if A is a maximal projection

It follows from (1) and (2) that functional projections which have a lexical specifier may be barriers, whereas functional projections specified by an empty category may not.³ Finally, I will assume (contrary to Chomsky (1986b) but in line with several others) that IP can be a barrier. This is of course the null hypothesis, but it is not just conceptually pleasing. Data like (3) demonstrate that, as a matter of fact, IP shows barrier effects:

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- (3) a. Por que [pro ha dicho que [Juan quiere a Maria]]
 b. Por que [Pedro ha dicho que [Juan quiere a Maria]]
 Why Pedro has said that Juan loves Maria
- c. Zergatik [pro esan du [Jonek Maria maite duela]]
 d. Zergatik [Peruk esan du [Jonek Maria maite duela]]
 Why Peru said has Jon Maria love has-that

In Romance Languages like Spanish, when IP is specified by *pro*, as in (3a), *por que* 'why' can modify either the embedded or the matrix clause. However, when IP is specified by *Pedro* (as in (3b)), only the matrix reading is possible.⁴ Basque shows exactly the same effects ((3c) and (3d)). In our terms, IP would not be a maximal projection in (3a) and (3c), but would in the other cases. This is the only apparent difference in structure between the cases with *pro* and the cases without it.

The strategy, thus, of what I will call "underspecifying" a projection seems a reasonable one to avoid a potential barrier. That is, a barrier will not be induced if *pro* specifies a given projection.⁵ (For further discussion and a full analysis of Wh-movement in Basque within these assumptions, see Laka and Uriagereka (1987), Uriagereka (1987).)

2. Another strategy for eliminating a barrier is what Chomsky (1986b) has called L(exical)-marking. Take the contrasts in (4):

- (4) a. Who have you seen [pictures of t]
 b. ?* Who have [pictures of t] reached everywhere

It is a well-known fact that extraction from a complement is much better than extraction from a subject (see Huang (1982) and references). Chomsky proposes that, in particular, a verb L-marks its complement, and this suffices to eliminate its potential barrierhood (as in (4a)), which would not happen in the case of a subject.⁶ From this point of view, there is an elegant explanation to the phenomenon of Subject/Aux inversion in terms of L-marking. I am taking this inversion to be a sub-case of the more general phenomenon of Verb-second, in the specific sense of Travis (1984 and elsewhere). The account I am going to give now will extend to other instances of Verb-second, but I will concentrate for concreteness on the English paradigm.⁷

Assuming that IP is a maximal projection, and that, in general, the option of an empty category to underspecify this projection is not available in English, then something else is needed. The option of verb raising is attested independently in UG. The landing site of the raising of an Auxiliary by hypothesis is Comp, an element that takes IP as its complement. Given that L-marking requires a lexical head, it is straightforward that Comp will L-

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mark IP only if the auxiliary raises to it, making it lexical.⁸ Thus, the contrasts in (5) are accounted for in a natural way:

- (5) a. ?* What [John has seen t]
 b. What has [John seen t]

This strategy for eliminating barriers does not seem to be an option for some languages, though. Basque is one such language. Consider (7a), with the structural analysis in (7b) (keep in mind that Basque is Comp last):

- (7) a. * Nor Jonek t maite du
 Who Jon love has
 b. [Nor [Jonek t maite] du]
 CP IP
 c. [Nor [pro t maite du]]
 'Who does s/he love'

If raising of the auxiliary *du* to Comp had the effect of L-marking IP, then (7a) should be perfect (with the analysis in (7b)). However, the only possible way of saying something equivalent to (7a) is as in (7c), where, in fact, we are underspecifying IP in the manner above (see Laka and Uriagereka (1987)). This clearly has to do with independent properties of the Basque auxiliary.⁹ Be that as it may, a parameter stating that if a given language has some option to eliminate a barrier, then it has to use it, is probably unnecessary. It is not even clear what the status of such a parameter would be.

3. One obvious question for the analysis above is what happens in a sentence like (8):

- (8) What are [you saying that [John has seen t]]

(8) is identical to (5a), except that the relevant question has been embedded under *saying*. But certainly movement of *what* is still across IP in the embedded clause, where IP is a maximal projection in all respects. I would like to propose that the matrix verb in (8) governs IP, hence L-marking it.¹⁰ The intuition is that a verb can, in some sense, govern across its complement if there is not "too much structure" in between. The question then is how much structure is "too much".

Consider (9):

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- (9) a. Mary knew [what [John had said t]]
 CP IP
 b. * Mary knew [that [never [John had said such a thing]]]
 CP TP IP
 c. Mary knew [that [never had [John said such a thing]]]
 CP TP IP

I will assume that a TOP Phrase, a maximal projection in all relevant respects, is involved in (9b)/(9c). Although somewhat restricted in English, this type of structure is common elsewhere. (9a) suggests that we want to let knew L-mark IP across one projection. In turn, (9b)/(9c) suggest that we do not want to let knew L-mark IP across two different projections (thus, subject/aux inversion is necessary). This situation is of course very reminiscent of Exceptional Case Marking sites, where a verb governs the specifier of its complement, i.e., governs across one maximal projection.¹¹

I propose (10) as a characterization of L-marking:¹²

- (10) A L-marks B only if
 (i) A is a lexical head,
 (ii) A c-commands B,
 and (iii) B m-commands A.

Assuming (10), note that knew in (9a) L-marks IP because, at the point in the derivation in which what is ready to move, there are no maximal projections, in the sense of (1), intervening between knew and IP, as (9a') shows:

- (9a') Mary knew [e [John had said what]]
 CP IP

Crucially, the specifier of CP here is empty and thus IP m-commands the matrix verb.¹³ So now we have a natural explanation for (8) in terms of (10). In particular, at the point of movement the relevant structure looks as in (8'):

- (8') you are saying [e that [John has seen what]]
 IP

(8') is identical to (9a') in the relevant respects: here, too, CP is not a maximal projection blocking the L-marking of IP by saying.

As expected, (10) does not go without consequences. The first obvious question is why it does not allow (11):

- (11) ?* Who do you wonder [what [John is giving t t]]
 CP IP

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But note that here the relevant sub-structure, in order to satisfy the principle of Strict Cyclicity, looks as in (11'):14

(11') you wonder [what [John is giving who t]]
 CP IP

Then, it is obvious that IP will not be L-marked by wonder, since a maximal projection, CP specified by what, intervenes between the matrix verb and IP.

Another question to answer is why (12b), a version of (11) in a language like Spanish, is in fact allowed:

(12) a. ?* A quien no sabe [que [Juan esta dando t]]
 To whom not knows what Juan is giving
 b. A quien no sabe [que [pro esta dando t]]
 To whom not knows what is giving

But note that (12a) is bad, just like (11). The only difference between (12a) and (12b) is that in one case Juan and in the other case pro is the subject of the embedded clause. That (12b) is much better is not really surprising in our terms: when IP is underspecified by using pro, IP is not a barrier, regardless of whether or not it is L-marked.15

So notice that from our point of view the real issue when extracting from Wh-islands is not CP, but IP. That is, CP will always be L-marked,16 but whether or not IP is L-marked, or whether it is in fact a barrier, depends on many other things. Thus, notice that the only obvious difference between (11) and (13) is that IP in (13) is underspecified:

(13) What do you wonder [how [PRO to fix t t]]
 CP IP

One often hears that the well-formedness of (13) is a result of the embedded clause being infinitival. Surely, though, that names the problem. From our point of view, the grammaticality of the example follows straightforwardly: (13) is the formal equivalent of (12b), and thus IP, the real problem in this type of cases, plays no role in the extraction of what.17

It is obvious from the discussion of (11) vs. (12b) that the analysis presented here derives the central difference in Subjacency effects between Romance and English noted by Rizzi (1982). There are still some difficult cases left unsolved,18 but the basic idea is that the independently motivated Pro-drop parameter is crucially responsible for the difference in question. This makes sense only if, as we have argued, IP and not CP is what is at stake in the extractions we are considering.

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4. But there is one empirical problem for (10) as stated. These are cases discovered by Esther Torrego, discussed in Chomsky (1986b:25):

- (14) [De que autora] no sabes [[que traducciones t]
 NP i CP NP i j
 Which author do you wonder which translations by

 [t han ganado premios internacionales]
 IP j
 have won international prizes

Torrego noted that, in Spanish, an extraction even from an island (in the case of (14), a subject) can take place so long as the island in question moves to the specifier of CP. Chomsky concludes from examples like these that in a sentence like (14) sabes L-marks the NP in the specifier of CP. But (10) does not predict this, since this NP does not m-command the verb in question (CP properly specified intervenes).

The obvious move is to modify the notion m-command in such a way that it holds of the relevant categories in (14). Here is a proposal:

- (15) A m-commands B iff all maximal projections not agreeing with A dominate B

(As in Chomsky (1986b:24), we are restricting attention here to head/spec agreement, and assume that a category agrees with itself and with its head.) (15) has some good consequences on itself. Note that it allows us to improve the standard definition of m-command in (15') (from Chomsky (1986b:8), following Aoun and Sportiche (1983)):

- (15') A m-commands B iff A does not dominate B and every maximal projection that dominates A dominates B.

Chomsky (1986b,fn.12) notes a potentially devastating problem for (15'): any element will m-command itself if, as Chomsky assumes in fn.11, domination is irreflexive.¹⁹ But in order to make (15') have any content whatsoever, domination must be irreflexive, or else the typical case of m-command in (16) would not meet this definition:

- (16) X
 / \
 NP ... NP'

NP in (16) m-commands NP' only if the fact that NP (a maximal projection) dominates itself is irrelevant. This is achieved if

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domination is irreflexive. This is a paradox, as far as I can see. The paradox disappears, however, if we assume definition (15), and we assume (as we should)²⁰ that domination is reflexive. Then, an element does not m-command itself because it dominates itself. But NP in (16) m-commands NP' because all maximal projections not agreeing with NP dominate NP' (NP agrees with itself, so it does not count).

(15) is also a solution for Torrego's cases in (14) without modifying (10). The specifier of CP agrees with CP. Hence CP is not the kind of maximal projection that intervenes between this specifier and the matrix verb for the purposes of m-command. In other words, the specifier que traducciones t in fact m-commands the verb knows, which results in this verb L-marking the NP, as desired.

5. A final problem for our analysis so far is the grammaticality of (17):

(17) John is the man who [Bill saw t]
 i IP i

Here, who is crossing IP under standard analyses, but neither Verb-movement nor underspecification of IP are invoked. One possible way to go about this is that, somehow, IP in (17) is L-marked by some element. But we have to be careful not to allow the extraction in (18) as a consequence:

(18) * Which woman_i is this the present which_j Bill gave t_j to t_i

Of course, (18) is not the only problem associated to extraction from complex NPs. Chomsky (1986b:35) notes the difficulty that examples like (19) present:

(19) ?* Who do you admire the fact that I am hiring t

It is not immediately obvious what could go wrong in these cases, since one may argue that all of the maximal projections that who crosses are L-marked. Itziar Laka (p.c.) notes an intriguing fact about (19) in Spanish: it improves drastically if the embedded verb is in subjunctive mood:

(20) a. ?* A quien admiras el hecho de que estoy contratando t
 b. ? A quien admiras el hecho de que este contratando t

Kempchinsky (1986) argues that, by LF, subjunctive verb-forms have to raise to the head of Comp for selection purposes.²¹ If she is right, and if este in (20b) raises to Comp already by S-structure,²² the embedded IP will not be a barrier in these cases.

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our problem. Let the notion lexical in (10) be characterized as in (23):

- (23) A is lexical only if its syntactic feature matrix is fully specified

The feature matrix of the head of CP in (22b) is fully specified because CP is predicated of man. We may interpret Williams's co-indexation as an instance of licensing of the index of CP by the index of man, in the spirit of Chomsky (1986a). Thus, in the technical sense of (23), the head of C is lexical (assuming percolation of indices) and it L-marks its complement IP, as desired. This solution does not create further problems for extraction across the relative clause since it itself is not L-marked, as we saw above.

6. This paper aims at simplifying the notion barrier by exploring different strategies to eliminate a potential barrier. What I have called underspecification is simply the option for a given functional category of not taking a lexical specifier, which results in this category not being a maximal projection, and thus not a barrier. L-marking is a process whereby a maximal projection which is structurally related to a lexical head, ceases to become a barrier. Given these, rather plausible, strategies, the notion barrier (for movement) is reduced to the notion "maximal projection which is not L-marked." Crucially, we have assumed that IP is not a defective projection in any relevant respect, and thus can be a barrier. Also, we have assumed that crossing even just one barrier is forbidden. What this seems to be telling^{us} is that maximal projections are opaque domains, which become transparent when they are L-marked. The challenge of further research will be to explain why L-marking turns an island into a peninsula.

NOTES

1 Chomsky (1986b) goes back and forth between assuming that one barrier is enough, or more are needed to invoke a Subjacency violation. But he has to admit (p.36) that in such standard cases as (i) crossing of one barrier is enough to induce a violation:

(i) ?* What did you wonder [[to whom] [John gave t t]]
 i j i j
 CP IP

Here, only CP is a barrier (in Chomsky's system, it inherits barrierhood from IP).

2 To be precise, in the definition in Laka and Uriagereka we did not mention anything about whether the relevant specifier is lexical, but whether it is licensed (in the sense of Chomsky (1986a)). We assumed crucially that empty categories are fully

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licensed only when construed to their antecedent. This relativization of the notion maximal projection entails that a given projection may become maximal in the course of the derivation. This is essentially Fukui and Speas's intuition, which we extended and implemented technically into the Theory of Empty Categories and their different types of construal. Of course, no issue arises with respect to lexical categories, which are licensed virtually in D-structure (or perhaps immediately after they receive Case successive cyclically, as in Davis (1984)).

3 To be precise again (following the reasoning in fn^{2/4}) a projection specified by an empty category will not be a barrier until this empty category is licensed. Assuming licensing of the empty category takes place at a cycle which is higher than the cycle immediately dominating this category, we will open a "window in time" for successive cyclic extraction across no barriers. This is the central intuition of this section of the paper.

4 Manuela Ambar points out to me that these facts may vary if Verb-preposing (a la Torrego (1984)) takes place. For issues relating to preposing, roughly, of this sort, see below. The reason why I chose examples like (3) is that, as Torrego pointed out, preposing is not obligatory in these cases, at least for many speakers.

5 As I said in fn.3, this is true at the relevant level. Throughout the paper, this will be the case, even if I do not refer to it explicitly.

6 The specific proposal of Chomsky's is rather complex and has been modified in class lectures (Fall 1987). The only relevant case at this point, however, is the straightforward one of lexical heads L-marking their complement. For a discussion of the initial and the revised concepts of L-marking, see Browning (1987). We return to these issues below.

7 Travis's proposal is based on the assumption that fronted phrases move to the specifier of CP, triggering the movement of the auxiliary to the head of Comp, in the general case. There are a number of parametric differences among the Germanic languages in this respect, neither of which I will go into here. To name just an obvious example, whereas the fronting of an adverb in a language like German triggers the phenomenon in question, it does not in English. I do not attempt, by any means, to cover the whole variety of data here (see Uriagereka (forthcoming) for further discussion).

8 This is exactly the way in which Chomsky (class lectures, Fall 1987) accounted for how Infl L-marks VP after raising of V to this head.

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9 This element is required by all regular verbs, even in simple forms like present or past, and it carries virtually all the morphology associated to the main verb, including all the agreement markers with the verbal arguments. For extensive discussion of these matters and arguments that the auxiliary does not raise to Comp in matrix clauses, see Laka (forthcoming).

10 In a sense, this intuition is present in traditional grammars where such statements were made as "a verb like wish governs subjunctive". Obviously, subjunctive is the mood of what we call today IP, which can be represented as a feature on Infl.

11 Constructions of this sort lead Chomsky (1986b) to postulate that in fact a relevant head L-marks the specifier of its complement. We return to this issue immediately.

12 For the purposes of this discussion, I assume the following definitions of c-command and m-command:

(i) A c-commands B iff A does not dominate B and every branching node that dominates A dominates B.

(ii) A m-commands B iff A does not dominate B and every maximal projection that dominates A dominates B.

I will extend the notion m-command immediately below, in relation to the issue in fn.11.

13 In this particular case, there is not even a maximal projection in the more general sense of Fukui and Speas (1986), since there is no specifier of any sort for CP.

14 The principle in question demands that no transformation apply within a cycle A if a transformation has applied already to a cycle B which dominates A (see Chomsky (1981) for discussion and further references).

15 Esther Torrego points out to me that (i), with a lexical subject, is still good in Spanish:

(i) A quien no sabes por que Juan envio una carta t t

Who do you wonder why John sent a letter?

It may be the case that the adverbial-Wh question in (i) moves by adverb movement, and not Wh-movement. The interesting contrasts in

(ii) seem to go in this direction:

(ii) a. ?* Me pregunto cuando [Juan habra llegado t]

'I wonder when Juan could have arrived'

b. Me pregunto en que momento [Juan habra llegado t]

'I wonder at which time Juan could have arrived'

The examples in (ii) are virtually synonymous. It could be that when the adjunct Wh-phrase has the phrasal structure of a prepositional phrase (and we pied-pipe the question), the option of adjunction to IP, instead of movement to Comp, is available. Crucially, por que (literally, 'for what (reason)'), has the structure of a prepositional phrase. All of these matters, though,

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are beyond the scope of this paper.

16 With the exception, perhaps, of non-bridge verbs. See Fukui (1986) for discussion.

17 This sentence raises an interesting problem: if neither IP nor CP in (13) are barriers, and if government can hold if no barriers intervene, what stops wonder from governing PRO? If we take the PRO theorem seriously, this has an easy answer defining Governing Category in terms of lexical government, perhaps defined exactly as L-marking in (10). This might have empirical difficulties which I will not address now, but surely has no conceptual problem, since there is no reason to think that "government" and "lexical government" are formally equivalent at some abstract level. Quite the opposite, from the point of view I am taking, government is a derivative notion which ends up depending in some cases on something like lexical government in the intended sense. Now, there is no reason why the Binding Theory should make use of a more extended notion of government than lexical government. But then PRO would have to be lexically-ungoverned, which is not in (13), even though it can be governed, as it is in (13).

18 For instance, the example in fn.15.

19 This fact entails, for instance, that (i) and (ii) are ungrammatical, whereas (iii) is grammatical, in terms of the Binding Theory:

- (i) John left
 i
- (ii) He left
 i
- (iii) * Himself left
 i

This is of course assuming that co-indexation is reflexive (a defining property of this relation).

20 Standard formalizations of phrase structure define domination as a reflexive relation (see e.g. Wall (1972)).

21 Kempchinsky argues that Romance desiderative verbs like wish select a command. She assumes that selection is a head-to-head relation, which entails that the subjunctive verb (with the relevant "command" feature) has to raise to Comp to be selected at LF. The specifics of her proposal are a little more complex, but the essential idea is this one. Kempchinsky attempts to explain the opacity effects in subjunctive contexts discussed in Picallo (1985).

22 (i) shows that when the subjunctive verb does not raise to Comp by S-structure, the result is still ungrammatical:

- (i) ?* A quien admiras el hecho de que [Juan este contratando t]

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In contrast, (20b) would be analyzed as in (ii):

(ii) ? A quien admiras el hecho de [[que]este] [pro contratando t]

23 It could be asked about (20a): why is it ungrammatical if the lower IP is underspecified (specified by pro)? It is plausible, however, that pro in these cases is licensed IP internally (in which case IP would be properly specified, according to what we saw in fn.2). In these cases left-dislocation is not an option:

(i) ?* ... el hecho de que [las manzanas [Juan las odia]]

... the fact that apples Juan hates them'

In Laka and Uriagereka (1987), and Uriagereka (1987), examples like (ii) were used to show that the option exists for pro to be licensed after the IP cycle precisely in contexts where Left-dislocation is possible (recall fn.3):

(ii) [Juan [a quien [pro ha visto t]]]

TOP i CP j IP i j

'Juan, who has he seen?'

These are the cases where IP would be underspecified, since pro may not be licensed until a higher cycle. When a lexical left dislocated phrase does not appear in the TOP position, we assumed that an empty topic is possible.

On the other hand, one could also ask about (20a) why Verb-movement is not an option there, which would end up L-marking IP. The answer to this question is beyond the scope of this paper, but it is independent of our discussion. In fact, note the contrasts in (iii):

(iii) * Yo admiro el hecho de que esta Juan contratando a Maria
Yo admiro el hecho de que este Juan contratando a Maria
'I admire the fact that is Juan hiring Maria'

Verb raising in these cases (localized intonations aside) is possible for the subjunctive, not the indicative form.

24 There are several issues that arise in relation to this that I will not be able to discuss here. Note at any rate that we cannot allow de to L-mark, or else the extractions under consideration will be perfect. A plausible way to go (in fact suggested by Chomsky) is making in particular structural Case assignment relevant to the definition of L-marking. Then, Case assignment cannot be defined in terms of government defined in terms of L-marking--but this seems plausible, given that the notion theta-government is defined in X'-terms (for an account of Exceptional Case Marking compatible with these ideas, see Davis (1987)).

25 The details of Pesetsky's analysis are slightly more complex, and the whole analysis would have to be rethought in current terms. Nevertheless, the point is that the complementizer that has an index in (22b) which it does not have in (22a).

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