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A Note on the Unification of Subjacency and the ECP

As is well-known the Chomskyan program of unifying bounding theory and the theory of government has not yet been completed. In fact, it appears that the *Barriers* framework has failed to achieve this aim, mainly because different concepts of barrierhood (L-marking and minimality) have to capture different phenomena: Some L-marking barriers cannot block government, and some minimality barriers cannot count as bounding nodes for subjacency.

In a number of papers, notably in Müller (1991), Müller & Sternefeld (1990) and Sternefeld (1991), it has been proposed that some major advances in the reunification of different concepts of barrierhood can be achieved by adopting a version of Baker's (1988) theory of abstract incorporation. It is the aim of this note to add one final step in this unification strategy, yielding the result that the concepts of barrier and of bounding node can be understood as completely synonymous[1].

In the above mentioned papers we proposed that a more unified concept of barrierhood and subjacency involves two steps. First, we defined a concept of barrierhood that does away with the notion of L-marking, being based on a primitive concept of minimality alone. To achieve descriptive adequacy this concept had to be augmented with the concept of incorporation as a means to open barriers. The resulting theory of barrierhood is briefly summarized in the first two sections of this paper. The second step was to add a theory of bounding which rests solely on the concept of barrierhood as developed in the first step. In Sternefeld (1991) this has been achieved by minimizing the theory of subjacency to a one-node-condition on movement; cf. section (3.) below for a sketch of subjacency along these lines.

In previous work it has also been assumed that IP is the only barrier that cannot serve as a bounding node (cf. Müller, this volume, for some discussion of IP as a barrier; in particular we claim that *that*-trace effects are induced by IP as a barrier). The assumption that IP cannot count for subjacency will be made more explicitly further below. But instead of making IP an exception in the definition of bounding

[1]Obviously, the thesis that the notions barrier and bounding node be synonymous was one of the working hypotheses of Chomsky's *Barriers*. But whereas considerable diversity emerged with respect to the nature and the task of barriers in Chomsky's system, the hypothesis to be defended here is that it is indeed possible to regain a unique concept that serves as the major link between the theories of government and bounding.

nodes, as proposed in earlier work, I now try remove this exception by claiming that it is possible to maintain the idea that all barriers are bounding nodes. In order to stay consistent with the facts while maintaining IP as a barrier and as a bounding node it will be necessary to demonstrate how to circumvent the bounding effect of IP. This will be achieved by an appropriate distinction between levels of representation.

The main idea is to eliminate the gap between subjacency and the ECP by treating subjacency in an ECP-like manner, so that the barrierhood of IP (and, for that matter, the boundinghood of IP) will only count at the relevant levels of representation, i.e. in S-structure for the derivation of *that*-trace effects; in LF for the derivation of superioritiy effects (cf. Müller, this volume); and either in S-structure or in LF for the derivation of subjacency effects. Given that the barrierhood of IP can be resolved in the context of *that*-deletion towards LF (cf. also Chomsky (1986), where deletion of *that* resolves the C′-barrier), the IP of a *that*-clause is no more a barrier in LF; and our ECP-like theory of bounding will be designed in such a way as to ensure that LF is indeed one of the levels where subjacency can be checked.

In essence, then, I would like to propose that the level where subjacency is checked must be one where IP is no longer a barrier; the similarity with the ECP comes in by the fact that it is S-structural movement that will be checked in LF. Technically, this can be achieved by assigning relevant features in S-structure (as usual), but performing the LF-checking of subjacency in such a way that either the S-structural features or the LF configuration itself may count. In other words, subjacency will be checked in LF, but relevant features will in most cases be assigned on S-structure, cf. section (4.) for an execution of this idea.

Obviously, this account of subjacency does not allow for traces (and there S-structural subjacency features) to be deleted towards LF; this feature of our theory necessitates a slight reformulation of the ECP to be stated in section (5.).

1 Background Assumptions: Barriers

The following definitions lie at the heart of a theory of barriers as proposed in Sternefeld (1991):

(1)

Barrier: XP is a barrier for any α included in XP, unless

(a) α is an escape hatch of XP, or

(b) the head of XP is non-distinct from the head of YP, where YP directly dominates XP.

(2)

Direct Dominance: YP directly dominates XP iff a segment of a projection of Y directly dominates XP.

(3)

Escape Hatch: α is an escape hatch of XP iff α is an A′-position and α =SpecX^2.

(4)

Non-Distinctness: X is non-distinct from Y iff either X and Y share an index ("incorporation"), or Y is an empty (functional) head ("empty identification").

The theory identifies two mechanisms to circumvent a barrier: adjunction (which will be ignored in this paper), and non-distinctness which is achieved by incorporation in the sense of Baker. Having incorporated a head X_i into Y_j (where all heads bear different indices), the latter will bear a secondary index i, so that overt or abstract incoporation will generate Y_{ji}. Apart from movement as substitution into an empty head, this is the only way how index sharing can come about[3]. Furthermore, I adopt from Müller (1989) that movement – and incorporation in general – observes a strict c-command condition, where c-command is defined as in Reinhart (1976), with the possible difference that inclusion will substitute for dominance in the context of segments[4]. This important condition merits some special attention further below; it is repeated in (5):

(5)

Identification Condition: Binding, abstract incorporation, and empty identification[5] are constrained by strict c-command[6].

Note that the above definitions do not involve any notion related to L-marking. This enables us to avoid the conceptual disadvantage of previous theories. The main *empirical* reason for not relying on L-marking in the definition of government is that L-marking is too strong in at least two cases: First of all, infinitives can be transparent for movement in a number of cases such as exemplified in (6):

(6)
(a) Which meeting$_i$ were they too angry [$_{CP}$ t'_i [$_{IP}$ PRO to hold t_i]]
(b) What$_i$ did John go home [$_{CP}$ t'_i [$_{IP}$ PRO to get t_i]]

[2] The only escape hatch relevant here is SpecC.

[3] This will become relevant in the derivation of the Head Movement Constraint; cf. below.

[4] The c-command restriction will become become relevant in the derivation of CED-effects; cf. below. Note furthermore that a head Y adjoined to X c-commands all the nodes c-commanded by X, because X does not dominate (i.e. include) Y.

[5] Empty identification is mentioned in (4) and concerns non-distinctness of I with an empty head C, where *that* has been suppressed or deleted; in these cases IP cannot be a barrier (for the subject position).

[6] In Baker's theory, abstract incorporation could be subsumed under movement and binding in LF. Something along this line could also be proposed for empty identification. Therefore, it suggests itself to cover all three cases by essentially the same condition on movement. In our theory, however, this is not that obvious, because we do not assume that abstract incorporation "announces" or pre-signals head movement in LF; hence incorporation cannot be reduced to movement and, hence, to binding at some level of representation; cf. again Müller, this volume, for further discussion.

(c) Wen$_i$	hat	[$_{CP}$ t_i [$_{IP}$ PRO	im	Krankenhaus t_i	zu	besuchen]		
Who	has		in-the	hospital	to	visit		
		dir	Spaß	gemacht				
		to-you	fun	made				

Examples like (a) and (b) illustrate extractions out of an adjunct, where according to Chomsky (1986: 34) "...the *wh*-chain has only 0-subjacency links." Example (c) illustrates extraction from an infinitival subject clause in German. Although there is some parametric variation across languages (which can be captured by additional assumptions concerning the presence or absence of empty functional projections embedding subjects and adjuncts in phrase structure), the general conclusion is that CED effects do not show up with infinitivals, and that, therefore, the L-marking condition, which induces subjacency violations, must be too strong. Secondly, PP-adjuncts can be transparent for movement as long as they show up close enough to a verb. This is demonstrated most clearly in examples like (7):

(7)

(a) weil	ich	den	Champagner	dafür	nicht	gekauft	habe
because	I	the	champaign	for-that	not	bought	have

(b) Da$_i$ habe ich den Champagner nicht [$_{PP}$ t_i für] gekauft

(c) *Da habe ich den Champagner [$_{PP}$ t_i für] nicht gekauft

In Müller & Sternefeld (1991) we concluded that certain adjuncts can be generated as a sister of V, close enough for the abstract incorporation of P into the verb to take place without violating the c-command restriction in (5). On the other hand, a PP being adjoined to a VP is directly dominated by VP. Since only CPs are assumed to have an escape hatch, PP is a barrier unless its head can be incorporated overtly or abstractly into V. But clearly, incorporation that departs from the adjoined position would violate the strict c-command requirement on incoporation[7].

Turning to subject island effects, incorporation of the head of a subject into I is blocked by the same requirement on c-command. As regards the non-L-marking effect of subject clauses (which always have an escape hatch) we assumed that all *finite* clauses are dominated by an NP-shell, i.e. by an NP with an empty head that selects a CP. This NP-shell will provide the additional barrier for the derivation of CED-effects (cf. Müller (1991) for further discussion).

As suggested in Baker (1988), the *wh*-island effect follows immediately from the fact that CP is always a barrier (except for SpecC), because C cannot be incorporated into another head (which might be due to the fact that functional categories cannot be incorporated into lexical heads).

Finally, the Head Movement Constraint follows quite straightforwardly from the above definitions. This is partly due to a consequence of (1), namely that XP is a barrier for X unless X is incorporated into the head mentioned in (1-b), which is – as a consequence of (2) and (5) – the head that "minimally" c-commands X[8].

[7]Regardless of whether the PP in (c) is generated as an adjunct to VP or as an adjunct to V′ – in both cases the identification condition cannot be met.

[8]Note, however, that the above conditions are stronger than minimal c-command. Although INFL would minimally command the head of a phrase adjoined to VP, incorporation into I is

To avoid unwarranted interaction between overt and abstract incorporation, we have to add a more or less trivial assumption concerning the use of secondary indices. As mentioned above I assume that the primary index of each head differs from the primary index of all other heads (except for the case that one head is the trace of the other), so that index sharing comes about only by secondary indexing. We then have to take care of the interaction between abstract and overt incorporation, because abstract incorporation might illegitimately open all barriers for a-cyclic overt head movement. In order to exclude cases like (8-c) below, it has been assumed in Sternefeld (1991) that a secondary index cannot be bound by a primary index:

(8)

(a) *Abstract identification of indices:*

Who C_{kj} t will$_{ji}$ leave$_i$

(b) *Overt cyclic movement:*

When [will$_{ji}$ C_k]$_{kj}$ he t_{ji} leave$_i$[9]

(c) *Overt acyclic movement:*

*Who [leave$_i$ C_k]$_{kj}$ t will$_{ji}$ [$_{VP}$ t_i]

In (c) the secondary index i of *will* allows for movement out of the VP of *leave*. This indexing is obligatory to permit movement out of VP in general. In the present case, however, the secondory index has become illegitimately bound by the primary index of *leave*; in this case head movement went too far and thereby binds an index that was essential to open the barrier for head movement. Hence, the condition against binding rules out a-cyclic movement that would have been licensed illegitimately by abstract incorporation. Although I do not want to present a formal proof here the reader may be confident that these assumptions suffice to derive the HMC from minimality alone.

2 Types of Non-Distinctness

Müller (this volume) has shown that the existence of an IP barrier is crucial to the derivation of *that*-trace effects and of superiority effects in English. The non-existence of these effects in German would follow from the assumption that IP cannot be a barrier in German. This, in turn, has been derived from the assumption that the head I can always be incorporated abstractly into (and hence will never be "distinct from") the head C in German. Thus, the non-existence of these effects in German is due to the possibility of abstract incorporation in this language, whereas their existence is due to the non-existence of this option in English. In English, only identification with an empty head can remove barrierhood from IP.

It has been assumed so far that non-distinctness results from three sources: overt incorporation; abstract incorporation; and empty identification. In order to

blocked by the requirement of direct dominance: the IP does not directly dominate the adjunct.

[9] Here, I have chosen to adjoin I to C. Although this is not an essential feature of the analysis, substitution might require some additional conventions for the use of indices. E.g., in a theory without D-structure, it would no longer be true that each head bears a different index. This minor technicalities will be ignored here.

illustrate the differences between these processes, I will briefly go into some of these cases discussed by Müller (this volume).

We assumed above that there is no (abstract) incorporation into C in English. Consequently, extraction of the subject across an empty C is possible only by empty identification, i.e. by lack of *that*. In LF, *that* may be deleted, which renders empty identification possible. Conversely, the the C-node of indirect questions is empty in S-structure, so that IP cannot block S-structural movement. In LF, however, C is non- empty but filled by an abstract question morpheme (cf. Baker (1970) or v. Stechow (1990)), hence LF movement of an the adjunct *why* as in the LF of (9),

(9)
I know who is leaving why

is ruled out by the ECP. Note that, according to Lasnik & Saito (1984), movement of the subject is already checked on S-structure so that the IP barrier is irrelevant for *who*. In matrix clause constructions like

(10)
Who will leave why

we rely on the general strategy that head movement must be redone in LF, which means that the reconstruction of *will* removes index sharing from C and I so that IP will become a barrier in LF. This is the case in (10), which shows that reconstruction reduces the matrix clause case to the case of embedded clauses already exemplified in (9).

As the astute reader might already have concluded from the above discussion, the idea of reconstruction of head movement is incompatible with Baker's claim that "abstract incorporation" implies head movement in LF; in LF, *ex*corporation is the only way of moving heads. Let us assume furthermore that abstract incorporation is possible in S-structure *and/or* in LF. This is exemplified in German where the lack of *that*-trace effects results from abstract incorporation in S-structure, whereas the lack of superiority effects results from abstract incorporation in LF.

With regards to these different processes the following restrictions seem to hold:

(11)

(a) Abstract incorporation observes the same locality constraints as overt incorporation; cf. (5).

(b) Incorporation in LF is limited to non-overt incorporation, i.e. head movement must be followed by excorporation and reconstruction in LF.

(c) Abstract incorporation is bound to the existence of overt incorporation in some given language.

(d) The possibility of S-structural abstract incorporation seems to imply the possibility of abstract incorporation in LF.

The last restriction naturally raises the question whether abstract incorporation in LF should be permissible (if and) only if it is legitimate in S-structure. Depending on one's theory of LF this may or may not be true. Thus, the case might arise that S-structural movement of an operator would yield an ECP-violation, whereas LF-movement is fine. From this one might conclude that abstract incorporation in LF could hold even if it is illegitimate in S-structure. For the purpose of this paper, however, I stick to the stronger claim that abstract incoporation cannot distinguish S-structure and LF: If it can apply in a given configuration at on one level it can also apply in the same configuration at another level.

3 Barriers and Bounding Nodes: the Exceptional Status of IP

The theory of barriers sketched above suggests that IP is in fact the only barrier for movement that cannot be a bounding node. From the perspective of the theory we have in mind (namely one-node subjacency) the (non-)boundinghood of IP should follow for the following reasons: First of all, it seems clear that CED-environments and *wh*-islands normally induce subjacency violations. Therefore, it is desirable to maintain the generalization that all barriers be bounding nodes. Second, it is quite obvious that IP in English–which is a barrier for movement of the subject in S-structure and for *wh*-phrases in LF–cannot be a bounding node, for if this were the case, S-structural movement of a non-subject to SpecC across *that* would lead to a (mild) subjacency violation, which is counter to fact.

What is non-trivial, however, is the question of whether or not the exceptional status of IP could be overcome in a theory of subjacency where crossing only one barrier is fine. In Müller & Sternefeld (1990) bounding nodes have been defined on the basis of barriers, but with a built-in mechanism of inheritance, just as in Chomsky's (1986) definition of a barrier on the basis of blocking categories. As in Chomsky's system, we regard subjacency as a gradual condition. In Chomsky (1986) two alternatives were discussed: a mild subjacency violation could arise from crossing either one or two bounding nodes; in his system only the latter turned out to be consistent with the overall system. Adopting this proposal in our system of minimality, it turned out that we still had to make the same stipulation as Chomsky; in other words, we still had to say that IP cannot be a bounding node *per se*. Within Chomsky's system this was enforced by the desire to count extractions from *wh*-infinitives as grammatical, hence IP could not be a barrier. Something similar holds in our framework, although on the basis of different premisses. One of the central ideas in our paper was that adjunction to VP is illegitimate in the course of *wh*-movement. Extraction from a *wh*-island as in (12),

(12)
?What$_i$ do you think t_i that [$_{IP}$ John didn't [$_{VP}$ know [$_{CP}$ how (t_i) to fix t_i]]]

may procede through an additional escape hatch (indicated by the bracketed trace in the topic-phrase position of the infinitive), which is of no concern here, but would still involve the crossing of at least three barriers, as indicated (where VP arises as a barrier by inheritence from CP). By all standards of gradual subjacency this should qualify (12) as strongly ungrammatical, which is counter to fact.

Within a system of one-node subjacency there is no condition of inheritance. Accordingly, VP cannot be a barrier by inheritance, nor can it erect a barrier by minimality (because of V and I incorporation). This still leaves us two barriers to be crossed, which still yields a strong violation in a system proposed here. More generally, the main effect of the Barriers account of subjacency should be that the bounding character of a constituent be determined directly at the place where the island arises. Hence, an additional barrier, namely, the IP of a matrix, which is not causally linked to a barrier that induces CED-effects, will always be disturbing, having nothing whatsoever to do with the intuitive reason for ungrammaticality. Thus, in a theory of gradual subjacency it would seem that IP as a bounding node will always lead to inconsistencies (as already observed in Chomsky (1986)), and would bring in again the inadaquacy of former analyses in terms of cyclic nodes.

In our present framework, we do not need any mechanism of inheritance, but crossing CP and IP would still involve a "strong subjacency" violation, if IP were a barrier. Crossing one barrier, however, induces only a mild subjacency violation, as originally proposed in Chomsky (1986) (recall again that Chomsky's proposal–being motivated by the assumption that the extraction from *wh*-infinitives is not perfectly grammatical–turned out as inconsistent with his theory and seems to have been dropped for that reason). In consequence, it seems that the definition of bounding nodes in a one-node theory of subjacency must still refer to IP as an exception. This is made explicit in (13):

(13)

Bounding Node: XP is a bounding node iff XP is a barrier $\neq$ IP.

(14)

Subjacency: Crossing one bounding node causes a mild subjacency violation; the crossing of two bounding nodes induces a strong subjacency violation.

Returning to example (12), which exemplifies extraction from a weak island, it is clear that only CP is a barrier, hence only a mild subjacency violation will arise.

The contrast with extractions from strong *wh*-islands, i.e. from finite clauses, can be derived from a particular assumption concerning phrase structure and topicalization. A large part of Müller & Sternefeld (1990) has been devoted to demonstrate that CP always embeds a topic phrase (TP) whose specifier is the landing site of topics. This landing site can be used as an escape hatch for topics. Crossing the topic phrase plus a CP (without using any escape hatch) always involves crossing two barriers. This will always be the case with *wh*-movement out of a finite *wh*-clause. Here, the topic position could serve only as an escape for topicalization, not for *wh*-movement. Infinitives, however, only have a degenerate topic phrase, whose specifier position cannot serve as a landing site for topics, but may nevertheless be used as an escape hatch for A′-movement in general, cf. our analysis of (12) with t' in the topic position SpecT.

In summary, the difference between finite and non-finite clauses with respect to *wh*-movement from *wh*-islands is basically the following: Only infinitives have an additional escape hatch for movement of *wh*-phrases. Therefore extractions from finite *wh*-complements will lead to a more severe violation of subjacency. In the present context, a full discussion would go beyond the limits of this note (cf. Müller & Sternefeld (1990) for more theory internal motivation and an analysis of topicalization). The important thing to verify here is that in any theory of gradual subjacency (and, even more so, in a theory of cumulative subjacency) an additional IP-barrier that arises in the matrix clause of cyclic extractions is unwarranted, for it would turn an intuitively *weak* island violation into a *strong* island effect, which is undesirable. Therefore, the conclusion that IP cannot count as a bounding node seems to be inevitable[10].

4 γ-Assignment for Subjaceny and the ECP

The above discussion should have made plausible that IPs always stand out as exceptions. However, as regards the unification of subjacency and the ECP, an optimal theory would have to get rid of these subjacency effects (of IP in S-structure); in fact, we are now trying to get into a position where it becomes possible to depart from the following hypothesis:

(15)

Bounding node: XP is a bounding node iff XP is a barrier.

Of course, (15) is no less than the claim that the notion of a barrier and a bounding node are synonymous. As pointed out above this unification gives rise to a number of non-trivial changes concerning the role of IP barriers and of the mechanisms involved to determine subjacency violations in general. We will begin with the following intuitive consideration.

IP as a barrier is effective just in two cases: either as a barrier for the subject in S-structure, or as a barrier for *wh*-movement in LF. Now, given that subjacency is relevant only in S-structure, it seems that the only relevant case we have to account for in order to maintain (15) is the effect of IP on S-structure. But this effect has been bound to the presence of the complementizer that in C. At the same time we assumed that this complementizer can be dropped in LF, which is what we need to permit for S-structural movement of adjuncts, because – following Lasnik & Saito (1984) in this respect – adjunct movement can be checked in LF. (But contrary to Lasnik & Saito, examples like *Why did he come* let us conclude that it can also be checked on S-structure because, by force of the presence and LF-relevance of a

[10]Note in passing that a one-node condition cannot handle cases where adjunct extraction yields an ECP effect while extractions of objects from the same domain would not even induce a mild subjacency effect. Several examples come to mind (compare extractions from "it is time to": *Mit wem ist es Zeit zu reden?* versus **Wie ist es Zeit sich zu benehmen?*). In most other cases of this sort (borrowed from Cinque (1989)) it is doubtful, however, that object extraction is really fully acceptable.

Q-morpheme in the C-position, empty identification no longer holds in LF, so that IP will become a barrier in LF; cf. Müller this volume for discussion.)

Now, the main idea is that (15) can hold only if the blocking nature of *that* in C could be suspended for subjacency in roughly the same way as for the ECP. This could be implemented by assigning some subjacency features at S-structure (and some can be assigned at LF) but subjacency as such would be checked only in LF. The reason for this move from S-structure to LF is clear: Only in LF can IP be made exempt from boundinghood when it is a barrier (and, by (15), ipso facto also a bounding node) in S-structure. The execution of this mechanism of feature assignment along the lines of γ-assignment relies on the idea that assignment of $-\gamma$ in S-structure will signal the lack of antecedent government for the level on which one-node subjacency is checked; but on this level, namely in LF, this feature will not lead to ungrammaticality, if the trace is in fact antecedent governed *on that level.*

In making these ideas precise let us begin with the classical tenet that subjacency is essentially an S-structural phenomenon. This seems to imply feature assignment for subjacency is obligatory in S-structure, at least for arguments. Furthermore traces that are subject to the subjacency condition can no longer be deleted on their way to LF; otherwise, there would be no way to deduce a violation of subjacency as a condition on LF. As regards feature assignment itself, I rely on γ-assignment as introduced by Lasnik & Saito (1984). In order to distinguish between a violation of the ECP and a subjacency violation I assume that γ-assignment splits up into the assignment two features: one that encodes antecedent government, and another that encodes lexical identification, which can be defined as assignment of a lexical Case (under government by a verbal category). These γ-features will be represented by $\pm\gamma_a$ and $\pm\gamma_{lc}$ respectively.

The following table lists all possible combinations of γ-assignment:

(16)

(a)	Subjacency violation:	$-\gamma_a$	$+\gamma_{lc}$
(b)	ECP-violation:	$(-\gamma_a)$	$-\gamma_{lc}$
(c)	okay:	$(+\gamma_a)$	$+\gamma_{lc}$
(c)	okay:	$+\gamma_a$	$-\gamma_{lc}$

The relevant point at this stage of our discussion is that these configurations could – provisionally, up to a revision enforced by the main problem to be solved in this paper – be taken to *define* ECP and (weak) subjacency violations, and that feature checking is done in LF, so that the conditions expressed by subjacency and the ECP could be interpreted as filters which exclude the respective combinations of features as indicated in (16).

Since subjacency is usually not regarded as a condition on LF it follows that assignment of the γ_a-feature is not obligatory for LF-movement. Thus, these features appear in parenthesis in the table above. With γ_a-assignment on LF being optional, an optimal derivation cannot generate a subjacency violation by means of LF movement. On the other hand, adjuncts need a $+\gamma_a$-feature to satisfy the ECP; hence, LF-assignment of this feature to adjuncts is enforced by the ECP.

Let us now look at short movement in S-structure. In the case of moving an object across IP, where IP is a barrier (as in the context of *that* in English), this yields a result that is in need of repair on LF: Since feature assignment to arguments is obligatory in S-structure (which is the only way to formulate subjacency as a filter applying to features), we first get a minus γ_a-marking of the trace on S-structure. However, we already exposed the idea that this situation can be revised in LF. Hence, after deletion of *that* the IP-barrier evaporates and it would seem that some reassignment of the feature $+\gamma_a$ in LF can save the derivation such that no subjacency violation can arise. This is the main idea; in order to carry it out we have to make further assumptions that regulate the assignment of γ-features. These are summarized in (17).

(17)
(a) Assignment of γ_a in S-structure is obligatory for traces of arguments.
(b) Assignment of γ_a for adjuncts may apply in S-structure or in LF.
(c) Deletion of traces is prohibited.

We will comment upon these conditions immediately. At this point of our discussion I would like to contrast object movement across *that* with subject movement. Here, the problem arises that some reassignment of features to the subject position would yield the untenable result that one could not derive an ECP violation after the deletion of *that*. Of course it would be possible to regulate feature reassignment in such a way that reassignment of γ_a can only apply to a $+\gamma_{lc}$-marked category or to an intermediate trace. But it appears that such a move would be ad hoc. The proper conclusion, then, seems to be that antecedent government in LF is sufficient to satisfy subjacency (but not the ECP).

The decisive step taken here is that subjacency will not be formulated by way of feature reassignment, whereas the ECP still has to refer to a positive assignment of γ-features. Our reformulation will also take into account that subjacency is automatically satisfied for traces that have received a positive γ_a-feature, hence we need not mention this case in the subjacency condition to be formulated below. On the other hand, traces that do not have any government features may arise from LF-movement, which is exempt from subjacency and therefore does not obligatorily leave a γ-feature. In conclusion, subjacency must mention a relevant government feature (i.e. one that has been assigned on S-structure), but the LF-condition to be satisfied by subjacency is antecedent government for a trace that has been marked as $-\gamma_a$ in S-structure:

(18)

Subjacency: A $[-\gamma_a]$-marked trace must be antecedent governed.

Recall that this condition applies to LF, whereas assignment of $-\gamma_a$ is S-structural, hence no contradiction arises. Furthermore, LF movement will trivially satisfy (18), because assignment of the relevant feature is not obligatory in LF. Observe also that we can dispense with any reassignment of features; in fact, reassignment was undesirable in the case of an S-structural ECP-violation (i.e. in the case of the *that*-trace effect), where reassignment of antecedent-government features had do be suppressed. In the present theory, assignment of the feature $-\gamma_a$ to the subject in S-structure is obligatory in that context. Feature marking (being permanent now) still implies that there is an ECP violation in LF for the case under discussion, i.e. in *that*-trace configurations. However, subjacency will be satisfied here, because the trace can be antecedent-governed in LF, after deletion of *that*. Hence, this approach eliminates a redundancy between subjacency and the ECP.

Another difference between subjacency and the ECP is nicely captured under the present account. Whereas the ECP is formulatied with respect to the presence or absence of certain features, the concept of subjacency is not, because a feature account alone (e.g. (16-a)) cannot naturally differentiate between strong and weak subjacency violations. Of course, some convention could be made up to capture gradual subjacency in terms of features. Conceptually, however, it seems that features are not the proper objects to encode gradual variation. According to the above proposal, the γ_a features encode two things: they account for ECP violations (which are not gradual); and they distinguish between different levels (which is again not a matter of degrees). Obviously, violations of subjacency will arise only with $-\gamma_a$ traces; but whether or not the violation is strong is not determined by reference to this feature: Much rather, it is a matter of whether or not antecedent government (in LF) is blocked by more than one barrier.

5 Reformulating the ECP

Let us return now to the issue of deletion of traces. The problem with (17-c) is that intermediate traces of objects never induce ECP-violations. Of course, we might stipulate that the feature γ_{lc} is carried along by move-α and could be left on each trace of movement. In other words, a category that has been lexically identified will always leave a $+\gamma_{lc}$-marked trace. Given that objects receive the feature $+\gamma_{lc}$ at their base position and create γ_{lc}-marked traces, only subjacency violations can result from movement of objects (or subjects of ECM constructions). It seems, then, that it is unnecessary to delete traces of objects towards LF. In fact, (17-c) ensures that deletion of traces cannot occur; otherwise there would be no chance for subjacency to be checked in LF.

As we will see further below, there is a more general solution to this problem; let us now illustrate some applications of the theory developed so far. Consider first adjunct movement, where the effect of deleting *that* and removing the IP-barrier for adjuncts can be captured by assigning $+\gamma_a$ to adjuncts in LF, as e.g. in (19):

(19)
Why$_i$ do you think [$_{CP}$ t_i'' that [$_{IP}$ Bill said [$_{CP}$ t_i' that [$_{IP}$ John will win the race t_i]]]]

Here, t_i'' gets its γ_a-feature in S-structure while t_i' has to wait until LF is reached. On the one hand, deletion of *that* opens the IP-barrier between t_i' and t_i'' in LF; on the other hand, the separation of Tense and the verb *say* will yield a VP barrier in LF. A derivational assignment of features would circumvent the problem, but such a solution should only be a last resort. Here, it suffices to adopt the thesis that abstract incorporation of V into I is always an available option, including abstract incorporation in LF. This means that incorporation is overt in S-structure but abstract in LF, so that no VP barrier ever can arise in any syntactic context[11].

Turning to movement of subjects again, we have seen that *that*-trace effects are be "permanent" and cannot be cancelled in LF. Observe also that NP-movement does not leave a γ_{lc}-feature, therefore it requires antecedent government, as proposed in Chomsky (1986). But what about intermediate traces of subject movement? Within the Lasnik/Saito theory these traces can be deleted towards LF, hence they must be susceptable to subjacency while being immune to the ECP.

To account for the grammaticality of (20), some revision of γ_a-assignment to intermediate traces seems to be called for:

(20)
Who$_i$ do you think t_i'' that [$_{IP}$ Bill said [$_{CP}$ t_i' [$_{IP}$ t_i will win the race]]]

Consider first the trace t_i''. This trace cannot receive its γ_a feature in LF, because C to I movement is reconstructed in LF, and abstract incorporation into C was unavailable in English, hence we create an IP barrier which turned out as crucial in the derivation of superiority effects. Fortunately, however, head movement has already opened the barrier at S-structure, therefore the trace t_i'' can be assigned the γ_a feature already on the surface. Turning next to t_i' we encounter a problem, because this trace is now subject to the ECP and cannot be governed (i.e. receive positive γ-marking) at S-structure. Some kind of reassignment of γ_a in order to guarantee antecedent government of t_i' by t_i'' in LF (where we delete *that* so that the IP-barrier will disappear) has been rejected above, at least for the case of government of the subject position. And so it should be in general. Note also that a similar, but more severe problem arises in (21):

(21)
Who$_i$ don't you know [$_{CP}$ how [$_{IP}$ to ensure [$_{CP}$ t_i' [$_{IP}$ t_i will win the race]]]]

The extraction in (21) has crossed a weak *wh*-island, hence it crossed a barrier that blocks antecedent government. According to Lasnik & Saito (1984: 268), however, the ungrammaticality of constructions of this type is not as strong as an ECP-violation. They classify examples like (21) as subjacency violations. Note that this judgement contrasts with the prediction of the *Barriers* framework, according to which the sentence should be perfect, because no bounding node has been crossed. In the theory proposed above it seems that we get an ECP-violation, because the trace is not deletable and a reassignment of features would be impossible in this case. If Lasnik and Saito's judgements are indeed correct we have to think of some way to mimick the effects of deletion in the framework under discussion.

As a clue for the solution of this problem consider again the case of adjuncts. note that intermediate traces of adjuncts should still cause ECP-violations in constructions such as (22):

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[11]Something like the reverse would also be enforced by lowering of I into V. This possibility has been ignored here. Note that it would require some reformulation along the lines of *GB*, as for inversion phenomena in Italian.

(22)
Why$_i$ don't you know how to try [$_{CP}$ t'_i [$_{IP}$ PRO to win t_i]]

Comparing the strong ungrammaticality of (22) with the weak violation in (21), it appears that one has to distinguish between the (intermediate) traces of arguments and those of adjuncts. In doing so I rely on the concept of referential binding as introduced in Rizzi (1989), where all traces of arguments are referentially bound if and only if their respective antecedent bears a referential θ-role. Given that subjects and objects are referential (as opposed to adjuncts, who are not), this prompts the following reformulation of the ECP:

(23)

ECP: A trace is either

(a) $+\gamma_a$-marked, or

(b) $+\gamma_{lc}$-marked and in an A-position, or

(c) referentially bound and in an A′-position.

Since intermediate traces of subjects and objects are always referentially bound, they automatically satisfy the ECP, by virtue of (23-c). Adjuncts which are not antecedent governed cannot satisfy the ECP. Since subject traces that are not antecedent governed are still referentially bound, this type of binding cannot be relevant in A-positions, hence (23-b) is crucial to the derivation of ECP-effects. As regards subjects in A- positions, we know that these cannot have lexical Case; hence they must be antecedent governed, as predicted by (23)[12].

Returning to (22), the intermediate trace cannot be referential, hence an ECP violation will result. In (21), however, the intermediate trace is referential, so that only a mild subjacency violation will result.

One last methodological remark (prompted by H. Haider, p.c.) might be in order. I am aware that (23) is even more disjunctive than the original ECP. Of course it would be possible to reformulate the condition in a more round about way, so as as to hide superficial disjunctions by pushing them into other parts of the theory. Thus far I have seen no theory that could dismiss completely with differentiating between different types of positions or moved items. In that respect it seems to me that the present proposal might at least claim the virtue of being more honest than much of what has been proposed in recent literature.*

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[12]As concerns the traces of NP-movement, these cannot have lexical Case, nor can they be in A′-positions, hence Chomsky's (1986) condition of antecedent government on NP-movement also follows from this reformulation of the ECP.

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