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Review

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N. Chomsky, *Barriers* (Linguistic Inquiry Monograph **13**). Cambridge, Mass. & London: MIT Press, 1986. Pp viii + 102.

Barriers is the latest of Chomsky's technical books. In it notions of barrier are defined, in terms of which Subjacency and the Empty Category Principle (ECP) are formulated. The discussion presupposes the Government and Binding framework presented in works such as Chomsky (1981; 1986), and is addressed to the specialist linguist. It represents the first comprehensive treatment of extractions provided by Chomsky in the GB framework, and should prove of the greatest interest to its readers.

The first set of proposals put forward relates to phrase structure theory. The structure of sentences is regularized to the X′ model by assuming that I(NFL) and C(OMP) are heads, each with a full set of X′ projections. The subject of the sentence is the Spec of IP. C is filled by lexical complementizers such as *that*; the Spec of CP is filled by XP's such as moved wh-phrases. These proposals have a number of appealing consequences. Not only are S and S′ regularized to IP and CP respectively; but the subject of a sentence now occupies a Spec position like the subject of an NP. Furthermore, if wh-phrases move into the Spec of CP, a version of the structure preserving hypothesis can be maintained, to the effect that maximal projections can only move into positions where a maximal projection can be generated by the X′ schema; similarly, only an X^0 can move into a head position. It is assumed that only X^0 and X^{max} can move at all.

The notion of barrier is based on the notions of θ-government and L-marking. According to the definitions given, α is θ-governed if a head θ-marks it; α is L-marked if a lexical head θ-governs it or some category that it agrees with. The definition of barrier has two clauses. Under the first clause, α is a BC (Blocking Category) if it is a maximal projection and it is not L-marked. Under the second clause, α is a barrier if it is either a BC (inherent barrier) or the first maximal projection that dominates a BC (barrier by inheritance). Projections of I, however, cannot be inherent barriers, though they participate in the inheritance mechanism.

Consider then the formulation of Subjacency and ECP. Subjacency states that movement cannot cross more than one barrier. This formulation derives

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the CED (Condition on Extraction Domains), including the Subject and Adjunct Constraints, and the Complex NP Constraint. Consider, for instance, the Subject Constraint, namely, that it is impossible to extract from the subject of a sentence. The subject, say an NP, is not L-marked, hence it is an inherent barrier; furthermore, the IP that immediately dominates it is a barrier by inheritance. Hence movement out of the subject into the immediately superordinate Spec of CP crosses at least two barriers, in violation of Subjacency. Similarly, it follows from Subjacency that it is impossible to extract from an adjunct (Adjunct Constraint); and that it is impossible to extract from a relative sentence (CNPC).

On the other hand, Subjacency allows for movement out of a VP under certain assumptions concerning adjunctions. First, only non-argument maximal projections can be adjoined to. Second, in an adjunction structure α dominates β only if all segments of α dominate β; similarly, α is defined to exclude β only if no segment of α dominates β. Third, a barrier α is crossed by movement only if α dominates the position moved from and excludes the position moved into. From the latter assumptions it follows that adjunctions create escape hatches. From the first assumption it follows that VP's can be adjoined to, hence have this escape hatch available.

Finally, consider the formulation of ECP. ECP states that a trace must either be θ-governed, or else the antecedent-trace link must not cross any barrier. In the latter case the antecedent is said to govern its trace. Direct objects satisfy ECP in all cases, in that they are θ-governed. For subjects and adjuncts the antecedent-government clause of ECP must hold. This version of ECP predicts the standard asymmetries between objects and subjects or adjuncts. In particular it predicts that subjects and adjuncts give rise to *wh*-island violations. Consider, for example, a subject. If this is moved to the Spec of CP no barrier is crossed, since IP is never an inherent barrier. However, if the Spec of CP is already filled by a *wh*-phrase and the subject has to move past it, at least one barrier is crossed, namely CP, which inherits barrierhood from IP. Hence ECP is violated. Similar considerations hold of adjuncts.

Let me now raise a few questions concerning the *Barriers* theory as presented so far. Consider the position of the subject as a Spec of IP. A perfect parallelism with NP's would require the subject position to be the Spec of VP. What is more, there is at least a class of subjects that is not generated in Spec position. These are the subjects of small clauses. Chomsky is not completely explicit on this point, but what emerges from the discussion of structures (29) and (39) in the text is that subjects of small clauses form a base generated adjunction with their predicates. If so, the generalization could be that subjects of sentences are adjoined to their VP's.

Consider next the assumption that I and C are heads in the X′ theoretical sense. Suppose we abandon the Spec of IP position in favour of a VP internal or CP adjoined position for subjects, as just sketched. X′ theory as such is

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perfectly compatible with the assumption that C is a head and has a full set of X′ projections, but I is not a head and has no X′ projections at all. This is also compatible with the relevant version of the structure-preserving hypothesis.

The questions I have concerning the theory of barriers are related to these observations on phrase structure theory. First, the role of IP in the definition of barrier is essentially different from that of all other maximal projections. A stipulation is explicitly introduced to the effect that, though IP can be a BC, and it can inherit barrierhood, and barrierhood can be inherited from it, it can never be an inherent barrier. This stipulation appears not to have any independent justification.

The second question concerns the characterization of Subjacency and ECP in terms of the same notion of barrier, but different numbers of barriers. *Barriers* itself explicitly comments on the fact that the grammar has a notion of (1-)subjacency satisfied when one barrier is crossed, but no comparable notion satisfied when a number of barriers other than 1 is crossed. According to Chomsky, 'this would follow from the assumption that languages do not have counters, but do employ the concept of adjacency; 1-subjacency is a form of adjacency' (30). Notice, however, that Subjacency is the only sub-theory of grammar that makes use of such a notion of adjacency. Elsewhere in grammar the zero barriers notion of adjacency is employed. This is true of ECP, but also of Binding Theory, whose locality requirements are 0-subjacency requirements, as well as of the linear adjacency requirements relevant for Case Theory, and so on.

Now, these questions do not arise if there is just one level of sentential projections above the VP level. In fact the original CED, based on the S/S′ theory of phrase structure, was a one barrier condition; and the notion of barrier used corresponded to the notion of BC, without any inheritance mechanism.

On the other hand the *Barriers* theory inherits at least one unresolved problem from preceding work. This is the disjunction between the θ-government and antecedent-government clauses in ECP, which effectively makes ECP into two different conditions. The question is worth raising again here because it seems that no theory of extractions can be truly satisfactory unless it is answered.

So far, our discussion has taken in essentially the first half of the book, up to and including Section 7. The remaining sections in part dwell on further domains of data, in part enlarge on the theory itself. It is worth pointing out in particular that Section 10 revises the theory of parasitic gaps presented in Chomsky (1982), in that the parasitic gap is now taken to be produced by movement of an empty operator. This accounts for the fact that parasitic gaps undergo Subjacency. In turn, the restrictions on the composition of the real gap chain with the parasitic gap chain could involve a government (0-subjacency) requirement; but no firm conclusion is reached on the issue.

Sections 8 and 11 are of special interest. Section 8 in particular introduces

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a new definition of barrier, by minimality, which is relevant for government, hence ECP, but not for Subjacency. By minimality, any X′ is defined to be a barrier for all categories it dominates, except X^0. The intuition is that government is blocked by an intervening head. Again there is an exception to this definition, and this is that I′ is excluded from barrierhood; this again raises the question as to the role of IP in the structure of the sentence, as before.

Section 11 extends the theory presented so far to cases of head-to-head movement and of movement to A-position. The central case of head-to-head movement is represented by the movement of V to I, which substitutes for cliticization of I on to V. V′ is not a minimality barrier for its head V. Furthermore, following the movement of V to I, VP is L-marked by V+I, hence not a barrier. Since neither V′ nor VP are barriers, V in I governs its trace, and ECP is satisfied.

The crucial case of movement to A-position can be taken to be movement from object into subject position, i.e. Spec of IP position as, for example, in passive. I′ is never a barrier; furthermore, if I is filled by the passive Aux, the Aux L-marks VP and VP is not a barrier. However, V′ is a barrier by minimality. Now, the derived subject is coindexed not only with its object trace, but also with the Aux in I. Suppose furthermore that the Aux is co-indexed with V. If so, a co-indexing chain is formed including the subject, the Aux, the V and the direct object. In this chain, according to *Barriers*, V antecedent-governs the object trace because of the shared indexing, thus satisfying ECP.

Let me now introduce a few remarks on these developments of the theory. First, as explicitly recognized in the book itself, the two definitions of barrier are mutually redundant with respect to ECP. There is no principled reason why one of the two notions should not suffice to define ECP violations. Second, the minimality definition introduces a distinction between Subjacency and ECP in terms of the notions of barriers involved, in addition to the distinction in terms of the number of barriers. Again there seems to be a redundancy between the two distinctions, and no principled reason why it should be so.

Going back to our previous comments, these redundancies could suggest that both Subjacency and ECP are in fact zero barriers constraints and are told apart only by the different notions of barrier involved. Furthermore, if the subject of a sentence is in VP adjoined or VP internal position, at least the potential barrier VP is never crossed by movement from the object into the subject position. This line of research seems worth pursuing because one would expect at least this type of A-movement to be derivable without need for any further assumptions. In particular, the assumption that government by a co-indexed element is sufficient to satisfy ECP, rather than antecedent government proper, seems to weaken the *Barriers* theory considerably.

Quite independently of these observations, however, it seems to me that the

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proposals in the second half of the book introduce potential alternatives to the theory in the first half, as much as they complement it in certain domains. It is in the development of these more open parts of *Barriers* that the direction of Chomsky's further research might well lie.

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