Barriers and Minimality Condition

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Son, Jang-Jin (1993). **Barriers and Minimality Condition.** *Linguistics*, Vol 1. Chomsky in his 'barriers' (1986) attempts to define a reasonable notion of barrier for both government and bounding: certain categories constitute barriers for syntactic processes. This paper introduces this 'barriers' system and shows how this system applies to both syntactic areas. This paper also discusses some potential problems of this theory and briefly intorduces the revised 'barriers' system.

1. Barriers for Subjacency and ECP

Chomsky (1986) presented the reasonable notion of barrier that can apply to both movement and government, hence to Subjacency and the ECP (Empty Category Principle). The notion barrier is defined as follows (with other necessary definitions for the subsequent discussion also added):

(1) γ is a barrier for β iff (a) or (b):
(a) γ immediately dominates δ, δ a BC (blocking category) for β;
(b) γ is a BC for β, γ is not IP.

(2) γ is a BC for β iff γ is not L-marked and γ dominates β.

(3) α is dominated by β only if it is dominated by every segment of β.

(4) α L-marks β iff α is a lexical category that θ-governs β.

(5) α θ-governs β iff α is a zero-level category that θ-marks β, and α, β are sisters.

(6) α θ-marks β only if α and β are sisters.

(7) α governs β iff α m-commands β and there is no barrier for β that excludes α .

(8) α m-commands β iff α does not dominate β and every γ, a maximal projection, that dominates α dominates β.

(9) α excludes β if no segment of α dominates β .

Immediate domination in (1) is a relation between maximal projections. (1a) expresses inheritance of barrierhood from the immediately dominated BC.

In the traditional theoretical framework, the Subjacency condition involves the notion bounding node, S and NP, to the effect that syntactic movement cannot cross more than one bounding node. Under the 'barriers' system, the notion of bounding node is replaced by that of barrier. Thus, the Subjacency condition is stated as follows:

(10) Subjacency (Chomsky 1986: 30)
If (α, β) is a minimal link of a chain, then β is subjacent to α.

(11) β is subjacent to α iff there are fewer than 2 barriers for β that exclude α.

According to (11) 0-subjacent or 1-subjacent relation must hold between β and α to satisfy Subjacency in (10). Thus, Subjacency defined under the new notion of barrier basically says, similarly to the traditional one, that crossing more than one barrier yields a Subjacency effect. It is also said in Chomsky (1986) that grammaticality gets lower as the number of subjacency barriers crossed gets increased. Here, what serves as a barrier, especially for Subjacency, is a maximal projection that is not L-marked.

The Empty Category Principle (ECP) can also be stated as follows:

(12) ECP (Chomsky 1986: 17)
A non-pronominal empty category must be properly governed.

(13) α properly governs β iff
α θ-governs β or α antecedent-governs β.

(14) α antecedent-governs β iff α governs β and α is co-indexed with β.

With this much, then, let us turn to the following example under this 'barriers' approach.

(15) $[_{CP}$ Who$_i$ $[_{C'}$ did$_j$ $[_{IP}$ you $[_{I'}$ t_j $[_{VP}$ t_i' $[_{VP}$ see $[_{NP}$ pictures $[_{PP}$ of $t_i]]]]]]]]$?

As seen in (15), Wh-movement proceeds via adjunction to VP. We assume, following Chomsky (1986: 6), that adjunction is possible only to a maximal projection that is a non-argument (thus generally not NP or CP). In (15) the movement of t_i to t_i' goes over three XPs, PP, NP, VP. PP is not a barrier because it is L-marked by the lexical category *pictures*. NP is not a barrier, either, because it is L-marked by the lexical category *see*. Neither is VP a barrier, because VP, the lower segment, does not dominate t_i'. The movement of t_i' to *who*$_i$ goes over two XPs, VP, IP. VP is not a barrier because its lower segment, VP_2, doesn't dominate t_i'. IP, being regarded as a defective category (see Chomsky 1986 for related discussion), is not a barrier, either. With respect to the ECP, t_i is properly governed, since it is θ-governed and antecedent-governed as well with no barriers intervening. The intermediate trace t_i' is also properly governed, since who$_i$ antecedent-governs t_i with no barriers between them. It is additionally noted that the head I(NFL) has moved to C(omp) via head movemet. This head movement must satisfy the movement constraints. Chomsky (1986) considered head movement as a kind of NP-movement, and thus, the trace left by head movement must be antecedent-governed in order to satisfy the ECP. Given this, the trace t_j in (15) must be antecedent-governed by the moved *did*$_j$. This is possible, since the intervening potential barrier IP is regared as a defective category to be a barrier in 'barriers' system.

Note also that the movement of *who* in (15) violates Subjacency without the hypothesis that Wh-movement can proceed via

adjunction, here to VP. Without VP-adjunction in (15), the movement in question will crosses two barriers, VP and IP, leading to Subjacency violation. The latter becomes a barrier via inheritance.

Now, let us turn to the cases of island conditions one by one under the
'barriers' framework. Let us first consider the case of CNPC (complex NP constraint). Complex NPs consist of two general categories: relative clause constructions and noun complement constructions. One typical example of the former is given in (16).

(16) *Where$_j$ did you see [$_{NP}$ the book$_i$ [$_{CP}$ which$_i$ John put t_i t_2]]] ?

In (16) *where* crosses two barriers. The embedded CP is a BC, since it is not θ-marked by any lexical category, and thus, it becomes a barrier. The NP dominating this CP thereby becomes a barrier by inheritance. Thus, the movement of *where* in (16) violates Subjacency.

The following is another standard island violation, a case of Subject Condition.

(17) ?*Who$_i$ [$_{IP}$ did [$_{NP}$ pictures of t_i] please you] ?

In (17) who also crosses two barriers. The subject NP is a BC, and thus, it bocomes a barrier. The IP becomes another barrier, since it immediately dominates this subject NP. Thus, the movement of *who* in (17) violates Subjacency.

Consider next the case of Wh-island Condition.

(18) ??What$_i$ [did you [$_{VP}$ t_i [$_{VP}$ wonder [$_{CP}$ whether [$_{IP}$ John [$_{VP}$ t_i [$_{VP}$ bought t_i]]]]]]] ?

In (18) what crosses only one barrier, the embedded CP, the

barrierhood of which comes from inheritance from the embedded IP. Chomsky (1986) suggests that full grammaticality is guaranteed only by 0-subjacency. Thus, the marginality of (18) is attributed to the fact that the movement sketched in (18) does not conform to 0-subjacency. Here the adjunction to the embedded CP is blocked by the adjunction condition intorduced earlier -- Adjunction is possible only to a non-argument maximal projection (thus generally not to CP or NP). Otherewise, the movement of *what* through the adjunction to CP will cross no barriers. It must also be pointed out that the movement in question in fact does not use adjunction to IP, either. If this possibility is allowed, no barriers will be crossed again. To eliminate this problem, Chomsky (1986: 5) proposes that a Wh-phrase may not adjoin to IP. This restriction on adjunction cites should also apply to examples like (16a,b). Otherwise, no Subjacency effect will be predicted in these examples.

Let us then turn to the case of Adjunct Condition.

(19) a. ?Who$_i$ [$_{C'}$ did [$_{IP}$ they [$_{VP}$ leave] [$_{CP}$ before speaking to t_i]]] ?
b. ?*To whom$_i$ [$_{C'}$ did [$_{IP}$ you [$_{VP}$ leave] [$_{CP}$ before speaking t_i]]] ?

In (19) the adjunct CP is a BC and a barrier, and IP inherits barrierhood. Thus, the Wh-movement in (19) violates Subjacency. (See Chomsky 1986: 32) for more discussion about the contrast between (19a) and (19b).)

The traces left by Wh-movement in the examples considered so far are properly governed by the relevant lexical categories, thus satisfying the ECP. In the case of adjunct extraction from an adjunct, however, yields a more stronger violation than a Subjacency violation, namely an ECP violation (Chomsky 1986: 32):

(20) a. *How$_i$ [$_{C'}$ did [$_{IP}$ you [$_{VP}$ leave] [$_{CP}$ before fixing the car t_i]]] ?
b. *Who left [$_{CP}$ before fixing the car how] ?
c. Who left [$_{CP}$ before fixing what] ?

(20a) exhibits an ECP violation in addition to a Subjacency violation. The trace of the adjunct *how* is not internally properly governed, and thus, it must be antecedent-governed. But how cannot antecedent govern the trace due to the barriers, adjunct CP and matrix IP as discussed above. In (20b) LF movement of *how* will yield an ECP violation in the same manner as in (20a). (20a,b) contrast with (20c), where *what* is properly governed by the verb inside the VP. Thus, *what* can move to the matrix initial position under the assumption that Subjacency effect does not show up at LF (Huang 1982, Lasnik and Saito 1984).

Let us next consider another category of CNPC constructions, the noun complement construction such as (21):

(21) ?Which book$_i$ [$_{C'}$ did [$_{IP}$ John [$_{VP}$ t_i''' [$_{VP}$ hear [$_{NP}$ a rumor [$_{CP}$ t_i'' [$_{C'}$ that [$_{IP}$ you had [$_{VP}$ t_i' [$_{VP}$ read t_i]]]]]]]]] ?

In (21) the Wh-phrase *which book* does not apparently cross any barrier. The embedded CP, the complement of the noun head *rumor*, is L-marked by this noun head, hence it is not a barrier. The verb *hear* L-marks its complement NP, thus this NP is not a barrier, either. Thus, no violation of both Subjacency and ECP is expected. Accordingly, the marginal status of (21) remains unaccounted for. Upon this problem, Chomsky (1986: 36) suggested that nouns assign oblique Case and that this imposes an inherent barrier to government. Under this suggestion, then, the embedded CP serves as a barrier, hence a typical weak Subjacency violation in (21). Thus, it is predicted that the adjunct extraction from this noun complement construction exhibits an ECP violation:

(22) *How$_i$ did [$_{IP}$ John [$_{VP}$ announce [$_{NP}$ a plan [$_{CP}$ t_i'' [$_{IP}$ to [$_{VP}$ t_i' [$_{VP}$ fix the car t_i]]]]]]] ?

The adjunct trace t_i is not properly governed inside the VP, thus it must be antecedent governed. However, the embedded CP now

constiturtes a barrier for this adjunct movement, leading to an ECP violation.

Let us also consider the following case of NP-movement, called Super-raising.

(23) *John$_i$ seems [that [it is considered [t_i to be intelligent]]]

In (23) the trace is not properly governed, since it is neither antecedent governed nor θ-governed by consider. Thus, ECP violation results. (In fact, more severe restriction is imposed on the NP-trace than the Wh-trace, that is, an NP-tarce must be antecedent-governed to satisfy the ECP (see Chomsky 1986)). Here the possibility of adjunction to VP and subsitution into CP SPEC is disallowed, since if this happens an improper movement, A-A'-A, results.

Let us finally consider the following contrast:

(24) a. the man [$_{CP}$ who$_i$ [$_{IP}$ I [$_{VP}$ t_i'' [$_{VP}$ believed [$_{CP}$ t_i' [$_{IP}$ t_i loved Susan]]]]]].

b. *the man [$_{CP}$ who$_i$ [$_{IP}$ I [$_{VP}$ t_i'' [$_{VP}$ believed [$_{CP}$ t_i' [$_{C'}$ that [$_{IP}$ t_i loved Susan]]]]]]].

In (24a,b) all the traces are antecedent-governed with no barriers intervening, hence in satisfaction of the ECP (and Subjacency as well). Thus, the contrast between (24a) and (24b) cannot be captured. (24b) is a well-known example of that-trace effect (Chomsky 1981). In addition to the first concept of barrier introduced and used so far, Chomsky (1986) also proposed the second concept of barrier, the Minimality Condition, which is formulated as follows:

(25) Minimality Condition (Chomsky 1986)
In the configuration ....α .... [γ ....δ....β ....],
α does not govern β if γ is the immediate projection of δ ,
a zero-level category distinct from β.

The Minimality Condition (25) captures the fact that the complement of a head cannot be governed by a more remote head. Chomsky (1986: 47) invoked this Minaimality Condition to yield the that-trace effect displayed in (24b). In (24b) the Comp *that*, but not the empty Comp in (24a), creates a minimality barrier, C', which blocks t_i from being antecedent-governed by t', by virtue of the Minimality Condition in (25). Provided that the subject trace is not internally properly governed, (24b), but not (24a), exhibits an ECP violation. Thus, that-trace effect shown in (24b) is attributed to the ECP. The barrier defined by minimality is assumed to hold only for government, not for movement (Chomsky 1986: 42). In the example (22), repeated below as (26),

(26) •How$_i$ did [$_{IP}$ John [$_{VP}$ announce [$_{NP}$ a plan
[$_{CP}$ t_i'' [$_{IP}$ to [$_{VP}$ t_i' [$_{VP}$ fix the car t_i]]]]]]]

the noun head *plan* also creates a minimality barrier N', which blocks antecedent governemnt, by virtue of the Minimality Condition in (24).

So far we have introduced two concepts of barrier proposed in Chomsky (1986) and discussed various examples of Subjacency and ECP cases under this system. We have seen that a certain category, a maximal projection, serves as a barrier for both movement and government. We have also seen that a minimality barrier is motivated for government in such a way that a certain head determines its immediate projection as a minimal domain for government.

2. Revised Barriers Theory

Chomsky (1987) in the Lecture in Japan pointed out that 'barriers' theory in Chomsky (1986) faces many apparent problems, and proposed 'revised barriers' theory. Considering seriously that

ECP in fact consists of two disjunctive parts, namely, lexical-government and antecedent-government, he separated the former from the latter, and proposed the following.

(27) Lexical Government Condition : A trace must be lexically governed.

(28) ECP : Every link of a chain must satisfy antecedent government.
Consider the following sentences.
[$_s$ who$_i$ do [$_s$ you think [$_s$ t_i' [$_s$ t_i saw peter]]]] ?
[$_s$ who$_i$ do [$_s$ you think [$_s$ t_i' that [$_s$ peter saw t_i]]]] ?

Thus, the ECP requires only antecedent governemnt, and the lexical government requirement changes into an independent condition. Based on this, Chomsky revised the definition of barrier as follows:

(29) γ is an inherent barrier iff γ is not H(ead)-marked nor L-marked.
a. α H-marks β iff β is a complement of a head α.
b. α L-marks β iff
(i) α is a lexical head.
(ii) β is an immediate constituent of the maximal projection H-marked by α.

(30) [α,γ] is a minimal barrier for β iff
a. there exists a maximal projection γ and a head δ and
b. α includes γ and δ and
c. β is contained within γ and within the complement of δ.

In terms of this 'revised barrier,' Subjacency is restated as follows:

(31) Subjacency
β is n-subjacent to α iff there are n-barriers starting from the category α, and if $n \leq 1$, then β is subjacent to α.

As discussed in section 1, Chomsky (1986) had two ways to define barriers -- (1) the barrier defined in terms of BC and inheritance, (2) the barrier defined by the Minimality Condition.

Chomsky (1987) abandoned the concept of barrier by inheritance and set up H-marking as in (29a), L-marking as in (29b), and a minimal barrier as in (30).

IP is not a defective category any more according to the definition of H-marking, under which a maximal projection is always a barrier when it is not a complement of a head. The barrier defined by L-marking applies only in an exclusive case like exclusive Case marking. Accordingly, L-marking is the same concept as SPEC-Head Agreement or Head-Head Agreement in Chomsky (1986).

Let us then consider some examples in terms of 'revised barriers.'

(32) a. How$_i$ would you prefer [$_{CP}$ for Bill to fix the car t_i] ?
b. *How$_i$ is it time [$_{CP}$ for Bill to fix the car t_i] ?

In (32a) CP is not a barrier because it is a complement of *prefer*. In (32b) CP cannot be H-marked by *time* since it is not a complement of *time*, and thus, it becomes a barrier. Thus, (32b) exhibits an ECP violation. The contrast between (32a) and (32b) then follows.

The following example of NP-movement can also be accounted for:

(33) *Bill$_i$ seems [$_{CP}$ that [$_{IP}$ it was told t_i [that John came]]]

(33) becomes ill-formed because t_i can't be governed by antecedent Bill$_i$ and it violates ECP.

Consider also the following examples.

(34) a. *Bill$_i$'s [$_{N'}$ appearance [$_{IP}$ t_i to be angry]].
b. Bill decided [$_{CP}$[$_{C'}$ ∅ [$_{IP}$ PRO to buy the GB]]].

In (34a) t_i is not antecedent-governed by *Bill*$_i$ because a barrier [N', IP] is between them. Here the structure is α=N', β=t_i, γ=IP, δ=N. Also in (34b) PRO is not governed because of barrier [C', IP], where β=PRO, γ=IP, and δ=C. Thus, the PRO theorm -- PRO must be ungoverned -- is satisfied.

The 'revised barriers' theory can explain various instances of island conditions:

(35) a. *What$_i$ did you [$_{VP}$ t_i'' [$_{VP}$ punish [$_{PP}$ since [$_{CP}$ t_i' [$_{IP}$ he hid t_i]]]]] ?
b. *Who$_i$ did Tom [$_{VP}$ t_i' [$_{VP}$ show you [$_{NP}$ Bill's [$_{N'}$ picture of t_i]]]] ?
c. Who$_i$ did Tom [$_{VP}$ t_i'[$_{VP}$ hear [$_{NP}$ t_i' [$_{N'}$ stories about t_i]]]] ?
d. *How$_i$ did he t_i''' find [$_{NP}$ [$_{NP}$ a [$_{N'}$ car]][$_{CP}$ t_i'' for Tom to t_i' fix t_i]]]] ?

(35a) is a case of the Adjunct Condition. The Wh-movement crosses three barriers -- [VP, VP], [VP, PP], and [VP, CP] seperate t_i' from t_i''. (35b) is a case of the Specified Subject Condition, but (35c) is not. If we suppose that SPEC of NP is a possible landing cite for movement, N' becomes a barrier in (79b) but not in (79c) (α=γ=NP, β=t_i, δ=N). In (35d) a **minimal** barrier doesn't exist between t_i'' and t_i''' because NP **does** not contain CP. Then the ill-formedness of (35d) follows. Since CP is not a complement of the head car and cannot be H-marked, CP becomes a barrier for adjunct movement, hence in violation of the ECP.

But let us consider one case of CNPC, the noun complement construction, in terms of 'revised barriers.'

(36) ?What$_i$ do you [$_{VP1}$ t_i'' [$_{VP2}$ hear [$_{NP}$ the [$_{N'}$ rumor [$_{CP}$ t_i' that [$_{IP}$ he made t_i]]]]]]

(36) is only marginal. Since t_i went over three barriers,

however, the wrong prediction results. In addition, t must always observe Lexical-Government Condition. This condition is always violated by the trace of subject or adjunct, since this trace is not governed by a lexical head.

So far we have introduced the 'revised barriers' theory outlined in Chomsky (1987), and tried to handle very limited range of examples under this new system.

3. Conclusion

We have introduced 'barriers' approach to various types of syntactic movement which Chomsky (1986, 1987) developed. The basic idea of this approach is that a certain category can serve as a barrier for both government and bounding. We have first discussed some range of examples in terms of 'barriers' proposed in Chomsky (1986), and then, 'revised barriers' proposed in Chomsky (1987). Although much remaines to be discussed, it seems that this kind of approach can handle many syntactic movement related to governemnt and bounding.

REFERENCES

Browning, M. (1987) *Null Operator Construction* Doctoral dissertation, MIT, Cambridge, Mass.

Chomsky, N. (1981) *Lectures on Government and Binding* Dordrecht: Foris.

Chomsky, N. (1982) *Some Concepts and Consequences of the Theory of Government and Binding* Cambridge, Mass.: MIT Press.

Chomsky, N. (1985) *Barriers* Cambridge, Mass.: MIT Press.

Chomsky, N. (1987) *Language in a Psychological Setting* Sophia Univ. Press.

Engdahal, E. (1983) "Parasitic Gaps" *Linguistics and Philosophy* 6.

Hornstein, N. (1984) *Logic as Grammar* Cambridge, Mass.:MIT Press.

Hornstein. N. and Lightfoot(1987) "Predication and PRO" *Language* 63.

Lasnik, H. and M. Saito(1988) "On the Nature of Proper Government"

Linguistic Inquiry 15:2.

Lasnik, R. and J. Uriagereke(1988) *A Course in GB Syntax: Lectures on Binding and Empty Categories* MIT Press. Camb., Mass.

May, R. (1977) *The Grammar of Quantification* Ph. D. dissertation, MIT.

May, R. (1985) *Logical Form* Cambridge, Mass.: MIT Press.

McNulthy, E. M. (1988) *The Syntax of Adjunct Predicates* Ph. D. Dissertayion, Univ. of Connecticut.

Pwawraky. D. (1982) *Paths and Categories* Ph. D. dissertation, MIT.

Pollock, J. Y. (1989) "Verb Movement, Universal Grammar and the Structure of IP" *Linguistic Inquiry* 20: 3.

Rizzi, L. (1987) *Relativized Minimality* Linguistic Inquiry Monograph Series, MIT.

Rothstein, S. (1983) *The Syntatic Forms of Predication* Ph. D. dissertation, MIT.

Safir, K. (1984) "Multiple Variable Binding" *Linguistic Inquiry* 15.

Stowell, T. (1981) *Origins of Phrase Structure* Ph. D. dissertation, MIT.

Taraldsen, T. (1979) "The Theoretical Implications of a Class of Marked Extraction" in Belletti et al. eds.

Williams, E. (1980) "Predication" *Linguistic Inquiry* 11.

Williams, E. (1983) "Against Small Clauses" *Linguistic Inquiry* 14.

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