BINDING IN ENGLISH AND JAPANESE (II)

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0. Introduction

In this part of the paper I will argue that the notion of barrier constrains binding as it does bounding. Specifically, I propose that principle (A) of the standard binding theory as proposed in Chomsky (1981, 1986a) be revised along the following lines:

(1) (A) An anaphor must be bound in the local domain.
(2) The "local domain" for α is the minimal maximal category that contains α and is a barrier.

This amounts to claiming that all kinds of locality requirements be expressed under the unified notion of barrier. This may be surprising at first, but may be less so considering the fact that anaphors are one type of dependent elements: they must referentially depend on some other elements for their full interpretation.

1. XP as a Barrier

It is to be noted that the definition of a local domain in our theory does not make any reference to the notion of subject. This immediately runs counter to the standard view that the crucial factor in determining the local domain for an anaphor is the presence of a subject. The categories S and NP have been held to play a special role in the theory of binding as well as in the theory of bounding. Thus, Chomsky claims that in the area of binding the relevant feature is not a merely categorial one distinguishing S and NP from others but rather the presence of a subject, which enters into the definition of a Complete Functional Complex, with all functional roles satisfied. However, if we were to adopt the VP-internal subject hypothesis, or rather the XP-internal subject hypothesis, we would lose much motivation for singling out S and NP. Therefore, the possibility remains to be pursued that a barrier or the notion of domain that makes no reference to subject enter into the definition of a domain for anaphor binding.

Let us begin by considering simple cases such as the following:

(3) John and Mary love each other.
[IP[John and Mary]i INFL [VP ei love each otheri]]

According to the system to be presented below, the VP that contains the reciprocal

anaphor in (3) counts as a barrier, so that it would violate our binding principle (1A) above if the local domain were the entire S or IP. The problem is resolved if we follow Kitagawa (1986) and assume that the local domain for an anaphor in sentences like (3) is VP. Within that VP domain, the reciprocal is bound by the trace of the raised subject, thus observing the binding principle (1A).

This analysis carries over to Japanese intact. Consider (4) below:

(4) [John to Bill]-ga otagai-o hometa (koto)
and -nom each other-acc praised (fact)
"John and Bill praised each other."

Two possibilities are conceivable for a Japanese clause, as indicated below:

(5) a. [IP NPi [VP ei (NP) V] INFL]
b. [VP NP (NP) V]

It seems to me that there is little if any empirical evidence that Japanese has any verbal agreement features. It is also doubtful that it has grammatical tense. Some traditional Japanese grammarians have considered the contrast between Verb-*ru* and Verb-*ta* not to be contrast of tense but rather one of aspect. This position would lead us to the view that Japanese has no INFL. Therefore in what follows, we will adopt (5b) for a Japanese clause structure. It then follows that in (4) the reciproal anaphor *otagai* is bound by the VP-internal subject, which is the correct result. It should be noted, however, that in fact the theory of anaphor binding proposed in this paper is neutral between (5a) and (5b), since even if (5a) were chosen, it could be claimed that the object anaphor is bound within VP by the trace of the raised subject.

That the categories S and NP should not be accorded any special status in the theory of binding can be seen by examples such as the following:

(6) *They saw snakes near themselves.

This example suggests that a PP can constitute a barrier or the local domain for an element that it contains.

The so-called "small clause" may provide yet another case for the claim that S and NP are not to be singled out in determining a domain for binding elements. Thus, consider (7) below:

(7) Johni considers Billj angry at himself*i,j.

There seems little evidence that the small clause here involves tense. It may involve agreement features but even if they exist in the small clause, it is reasonable to

consider them to be realized within the AP. Thus, the small clause in (7) should be analyzed as an AP rather than an IP, as shown below:

(8) John$_i$ considers [$_{AP}$ Bill$_j$ angry at himself$_{*i,j}$]

The local domain for the reflexive is the AP, within which it is bound by the right antecedent *Bill*.

1. The *Barriers* Approach to Binding

Thus, the idea that the notion of barrier enters into the determination of the local domain for an anaphor is by no means implausible. But this apparently too simplistic approach to binding appears to immediately encounter a number of counterexamples. Consider the following examples:

(9) a. He thinks that pictures of himself are on sale.
b. They think that pictures of each other are on sale.

If a barrier in the sense of Chomsky (1986b) constitutes the local domain for an anaphor, the sentences of (9) should be completely ungrammatical.

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

(11) γ is a barrier for β iff (a) or (b):
a. γ immediately dominates δ, δ a BC for β;
b. γ is a BC for β, $\gamma \neq$ IP.

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

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

Given this system of barrier, it follows that the *picture* noun subject in each sentence of (9) is a barrier, because it is not L-marked. Furthermore, the IP node in the embedded clause is also a barrier, inheriting barrierhood from the *picture* noun subject that it immediately dominates. This means that there are two barriers between the anaphor and its antecedent, which is the VP-internal subject in the matrix clause. This predicts that each sentence of (9) should result in a severe violation of the locality for anaphor binding, but this is clearly wrong.

Rather than hastening to conclude that the concept of barrier is irrelevant to binding, let us suppose that there are no barriers between the anaphor and its antecedent in the sentences of (9) and ask why that is the case. First, it should be noted that the anaphors in (9) are interpreted as objects or complements. If they

are not complements, the sentences are bad.

(14) ??They think that pictures near each other are on sale.

(15) * They think that pictures of each other's are on sale.

It seems reasonable to regard the post-nominal genitive in (15) as some sort of adjunct. If this analysis were correct, we could have some reason to take it as another case of complement-adjunct asymmetry, which in turn provides support for our barrier-based approach to binding.

We propose the system of barrier radically different from Chomsky's. We think that the maximal projection of a lexical category is a barrier; another way of saying the same thing is that any category forming a thematic domain is a barrier.

(16) γ is barrier for β if (a) or (b) or (c) holds:
(a) γ is not head-governed,
(b) γ constitutes a thematic domain,
(c) γ immediately dominates β, which is not head-governed.

(17) α head-governs β iff α is a head and every category that dominates α dominates β.

We also depart from Chomsky in admitting the notion of multiple barrierhood: a single category can be a double barrier, which we asssume corresponds to two separate barriers.

We will now see how the proposed system accounts for the binding phenomena in English and Japanese. Let us first look into the LF representation of (9b), represented as follows:

(18) [IP they$_i$ INFL [VP e_i think [CP that [IP [NP [NP pictures]
[PP of each other$_i$]]$_j$ [IP e_j INFL be on sale]]]]

We assume that PP Extraposition has taken place within the *picture* noun phrase and that the entire noun phrase subject has been adjoined by QR to the embedded IP. Nothing bars these operations. As before, let us take the trace e_i in the SPEC of the matrix VP to be the actual antecedent of the reciprocal anaphor. We can see that there are no barriers between the anaphor and its antecedent, because a chain of head-government relations holds between them. The matrix verb *think* head-governs the CP; *that* head-governs the raised *picture* noun phrase. And what is more important, it also head-governs the PP *of each other*. Recall that α head-governs β iff α is a head and every category that dominates α dominates β. Finally,

the preposition *of* head-governs *each other*. Note that the *picture* noun phrase is potentially a barrier for the anaphor, because it forms a thematic domain, but in (9b) its barrierhood has been voided by extraposing the PP. Thus, there are no barriers between the anaphor and its antecedent, so that the anaphor-antecedent relation is predicted to be licit, as desired.

If this line of account were correct, it would predict that if the chain of head-government were broken at one point or another, the resulting sentence would decrease in acceptability. This prediction seems to be correct. Let us consider again (15), repeated here as (19a).

(19) a. *They think that pictures of each other's are on sale.
b. They think that pictures of theirs are on sale.

Essentially following Jackendoff (1977), let us assume that the internal structure of the *picture* noun phase subject in (19) is something like (20), where the "post-genitive" phrase is analyzed as a prenominal genitive plus a null head.

(20) [NP [N' [N pictures [PP of [NP [? each other's] ϕ]]]]]

The status of the genitive marker *'s* is not entirely clear, but let us assume for the sake of argument that it is a postposition heading a postpositional phrase. We also assume that a prenominal genitive takes the form of base-generated adjunction structure. Given this structure, our system treats the prepositional phrase *of each other's* as a barrier for the reciprocal, since it is not a complement but an adjunct. One might ask here why the prepositional phrase cannot adjoin to the whole NP to void its barrierhood. We assume that adjunction of adjunct PP's is barred. Furthermore, the entire *picture* noun phrase constitutes a barrier for *each other*, because it is a maximal category that forms a thematic domain. Thus, there are at least two barriers intervening, in violation of principle (1A).

Our system accounts for cases of the NIC violation though with some additional assumptions.

(21) *John thinks that himself will win.

(22) John-wa [zibunzisin-ga katu to] omotte-iru.

On our accounts, there are two reasons to be held responsible for the low acceptability of (21): the anaphor itself is not head-governed, so that the IP, which immediately dominates the anaphor, should count as a barrier. Furthermore, the IP constitutes a thematic domain and hence is a barrier. We assume that although usually VP forms a thematic domain, the property is transmitted to the IP node when the VP-internal θ-marked subject raises into the SPEC of the same IP. This

means that there are two barriers between the anaphor and its antecedent (the VP-internal subject of the matrix clause). In order to make this account go through, however, we have to make one more assumption, which is the following.

㉓ The subject of a finite clause cannot adjoin to IP, unless it is a quantified phrase.

It is entirely not clear, however, what principle bars adjunction of a finite subject to its containing IP, though it appears we need to prohibit such an operation anyway. Lasnik and Saito (1992) notes that topicalization, which they consider to be an instance of IP-adjunction, has to be somehow prevented from applying to the subject of a finite clause.

㉔ *[IP Johni [IP ei left]]

So let us assume that ㉓ holds true, however it may be derived. Given this assumption, sentence ㉑ now follows in full. The embedded IP is doubly a barrier, since the anaphor itself is not head-governed so that the IP counts as a barrier. The same IP node is a barrier in another sense, as we have seen above. There are thus two barriers between the anaphor and its antecedent, in violation of principle (1A).

Let us now turn to the Japanese sentence ㉒, in particular to the question of why NIC violation does not hold in Japanese.

㉕ Johni -ga [[zibunzisini-ga [ei katu]] to] omotte-iru

I assume that ㉕ is a case of the so-called "multiple subject" construction. It is immaterial whether *zibunzisin-ga* has been raised in syntax or is base-generated in place. All that matters is that it occupies the clause-initial position as a focus. In this structure, a chain of head-goverment holds: the reflexive is head-governed by the complementizer or postposition *to*, the embedded CP is head-governed by the matrix verb *omotte-iru* "think," and so on. Therefore, there are no barriers for the anaphor, so that the antecedent-anaphor relation is licit.

It has been pointed out in Lebeaux (1983) that there are significant contrasts between reflexives and reciprocals in English (judgments are his) .

㉖ a.??They think that each other will win.
b.**He thinks that himself will win.

Lebeaux proposes that reflexives obey an extra condition in addition to the binding condition (A): reflexives must be properly governed. He then reduces this to the ECP by proposing that reflexives as a whole and *each* of *each other* raise at LF, with their respective traces subjected to the ECP. Here I will propose an alternative

account of the differences between reflexives and reciprocals. The basic idea is that reflexives involve one barrier more than reciprocals and that this comes from some intrinsic properties of reciprocals, that is, from the fact that they involve universal quantification. Let us again consider (26).

(27) they$_i$ [$_{VP}$ e$_i$ think that [$_{IP}$ each other$_i$ [$_{IP}$ e$_i$ will win]]]]

As we have seen, if nothing happens, there will be two barriers since the embedded IP node counts as a double barrier. However, since *each other* involves universal quantification, it can and must raise at LF, which we think has the effect of decreasing the barrierhood of the IP node by one degree. By contrast, since reflexives are not quantifiers, *himself* in (26b) cannot be raised so as to decrease the barriehood of the IP node. There is then one barrier between the reciprocal and its antecedent in (26a) but there are two barriers between the reflexive and its antecedent in (26b), which thus explains the contrast between the two sentences.

Consider the following sentences, which Lebeaux did not consider.

(28) a. They saw snakes near each other.
b. *They saw snakes near themselves.

In both sentences the PP is a barrier because it is an adjunct and not head-governed. Thus, we think that (28b) represents the regular paradigm. The one that calls for an explanation is (28a). There are two possibilities: either the PP *near each other* is already adjoined in syntax to the VP node or it is raised in LF.

(29) a. they$_i$ INFL [$_{VP}$ [$_{VP}$ e$_i$ see snakes] [$_{PP}$ near each other]]
b. they$_i$ INFL [$_{VP}$ [$_{PP}$ near each other] [$_{VP}$ e$_i$ see snakes]]

I do not think that the raising of quantified expressions necessarily has to be restricted to LF, as long as its main function is to creat an operator-variable structure. In either structure (29a) or (29b), the reciprocal is directly bound by *they*, since it is head-governed by the preposition *near*, the PP is head-governed by INFL. This option is not available to the reflexive in (28b), so that there is no way to void the barrierhood of the PP.

Finally, let us consider an interesting contrast observed by Johnson (1985):

(30) They read proofs that pictures of each other had been forged.

(31) *They read theorems that books about each other explained.

At first sight it seems that sentence (30) constitutes counter-evidence to our

barrier-based approach to binding, since complex NPs such as that in (30) involves at least one barrier and this should block the binding of the reciprocal by the matrix subject (or to be more exact, by the VP-internal subject). The salient difference between the two sentences is that (30) involves a noun-complement structure, whereas (31) involves a relative clause structure. Thus, it is possible to analyze the complement clause in (30) as having the structure as in (32).

(32) They read [NP [NP proofs] [CP that pictures of each other [IP e had been forged]]]

As before it is assumed that the *picture* noun subject has been raised at LF within the embedded clause and it is also assumed that the whole embedded clause has been adjoined to the NP of which *proofs* is the head. This makes it possible to establish a chain of head-government relations. In (31), by contrast, although the embedded subject can be raised as in (30), the relative clause cannot be raised because it is an adjunct. This results in creating two barriers between the reciprocal and its antecedent in (31). Thus, rather than consitituing counter-evidence, the examples (30) and (31) provide support for our approach given some reasonable assumptions.

I have argued in this paper that anaphor binding is constrained by the notion of barrier, originally proposed to unify the theory of movemnet and government. If the analysis of anaphor binding in this paper were correct, it would lead to further unification in linguistic theory.

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