On Anaphors - A Note on Representational Differences between Reflexives and Reciprocals in English
On Anaphors: A Note on Representational Differences between Reflexives and Reciprocals in English*

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0. Introduction

In this paper, we are mainly concerned with distributional differences between reflexives and reciprocals in English. The binding theory proposed in Chomsky(1981) and other various versions of the theory predict that these two types of anaphors have the identical distributions. But Lebeaux(1983) casts doubt on this prediction by showing some differences in distribution between reflexives and reciprocals. More specifically, he claims that a certain restriction seems to be imposed on the distributions of reflexives, but not on those of reciprocals; only reflexives must be in the properly (lexically) governed position. If Lebeaux is correct, it is very natural to consider that the E(mpty) C(ategory) P(rinciple) is involved somehow in the relevant phenomenon, since the principle is defined in terms of proper government. Indeed, he himself attempts to reduce the contrast between reflexives and reciprocals and the sensitivity of the former to the proper government to the ECP. If the ECP regulates the distributions of reflexives, then it seems to be the optimal explanation for the restriction on the occurrence of reflexives that the position they occupy at the level of S-structure is empty at the level of Logical Form. This reasoning presupposes that prior to LF, a reflexive moves somewhere leaving a trace which is subject to the ECP. The restriction on their appearance would then simply follows from the ECP and no further stipulation is needed. As for reciprocals, there seems to be two possibilities for explaining their insensitivity to the ECP. One is that unlike reflexive pronouns, they do not move at LF and so the principle is irrelevant for their distributions. The other possibility is that reciprocals move, but their movement is not subject to the ECP.

The aim of this paper is to examine how the distributional differences observed in Lebeaux(1983) can be accounted for in the
recent GB-framework (including the post Barriers framework). This paper is organized as follows: in the first chapter, we present some relevant data mainly from Lebeaux (1983) and Hong (1988) and see some differences between reflexives and reciprocals. In chapter two, the theoretical assumptions are given including the barriers framework proposed in Chomsky (1986b), the binding theory and the revised Empty Category Principle. In chapter three, following Pica (1987), we propose LF-movement of reflexives and give an account for distributitional restriction on them. In chapter four, we introduce the system proposed in Heim, Lasnik and May (1988) which supposes, in the case of reciprocals (in particular, each other), the LF-movement of each of each other. Along this line, we propose that this LF-movement would leave behind a trace which is always properly governed in the structure of the Noun Phrase each other.

1. Distributional Differences between Reflexives and Reciprocals

In this chapter, we cite some data which show some distributional differences between reflexives and reciprocals. What can be observed is that in some circumstances where a reciprocal each other can appear, the appearance of reflexives are not permitted. First let us consider the following examples involving anaphors as the subject of an embedded tensed clause:

(1)a. ??John and Mary think that each other will win.
b. **John thinks that himself will win.
c. ??John and Mary believe each other will genius.
d. **John believes himself will win.
e. ?John and Mary wondered if each other would win.
f. **John wondered if himself would win. (Lebeaux (1983))

All of these examples should be excluded under the binding theory which incorporates the Nominative Island Constraint (NIC, Chomsky (1980)) or the notion of accessible SUBJECT (Chomsky (1981)) into it. According to Lebeaux (1983), as for the cases where an anaphor occurs as the subject of a tensed embedded clause, the one involving each
Other is more acceptable that the one with a reflexive. This contrast between self-phrases and each other is much more clear in the following examples:

(2)a. John and Mary didn’t know what each other had done.
    b. John and Bill were deciding what each other should do.
    c. *John didn’t know what himself had done.
    d. *Mary was deciding whether herself should leave. (ibid.)

As in (2a,b), when each other is in the subject position of an embedded interrogative clause, the sentence is completely grammatical. (2c,d) illustrate, however, that the examples are still ungrammatical with reflexives:

Let us now turn to infinitives. Consider the examples in (3):

(3)a They want each other/?themselves to win.
    b. They prefer for each other/?themselves to win.

Though the reflexives are slightly worse than the reciprocals, both type of anaphors can appear in the subject position of the embedded infinitival clause. This sharply contrasts with the unacceptable examples in (2c) and (2d) where reflexives appear as a subject of the embedded tensed clause. The contrast between reflexives and reciprocals does not show up in ECM-constructions, either:

(4)a. John expects himself to pass the examination.
    b. John and Mary believes each other to be honest.

Now consider the follow samples, suggested by Jun Abe(p.c.):

(5)a. They want very for each other/?themselves to win.
    b. They prefer very for each other/?themselves to win.

In these examples, the infinitival complements are extraposed to the right periphery of the

es. These sentences exhibit a contrast,
the reciprocals being considerably better than the reflexives. The binding theory itself would not explain the contrast since it would predict that all of these are grammatical.

As is known, each other can appear in the prenominal genitive position, while reflexives cannot:

(6)a. John and Mary like each other's parents.
   b. *John likes himself's parents.  (Lebeaux(1983))

(7)a. John and Mary like those pictures of each other's friends.
   b. *John likes those pictures of himself's friends. (ibid.)

We will explain this contrast by introducing the structure of NP called the DP-analysis developed by Tomoike(1988) and Takano(1988).

Finally let us consider the following:

(8)a. John told Mary that there were some pictures of themselves inside. (Lebeaux(1985))
   b. *John told Mary that there were some pictures of each other inside.

It is illustrated by (8a) that a self-phrase is allowed to have a split antecedent. Unlike this, each other never allow a split antecedent, as in (8b).

2. Theoretical Framework

First we briefly review the framework of Chomsky(1986a) and Chomsky(1986b). Then we propose a revised ECP, along the lines of Chomsky(1986b) and Takano(1988), where θ-government are eliminated from the definition of proper government and the ECP is treated simply as a chain phenomenon.

As for the theory of binding, we adopt the system proposed in Chomsky(1986a) which is given in (9):

(9) Principles A, B, C:
   (A) for α an NP, and β a local domain, an indexing I is binding
theory compatible with \((\alpha, \beta)\) iff:

(a) \(\alpha\) is an anaphor and is bound in \(\beta\) under \(l\).
(b) \(\alpha\) is a pronominal and is free in \(\beta\) under \(l\).
(c) \(\alpha\) is an \(r\)-expression and is free in \(\beta\) under \(l\).

(B) Licensing Condition:
for a category \(\alpha\) governed by a lexical category \(\tau\) in the expression \(E\) with indexing \(l\):

For some \(\beta\) such that (i) or (ii), \(l\) is BT-compatible with \((\alpha, \beta)\):

(i) \(\alpha\) is an \(r\)-expression and (a) if \(\alpha\) heads its chain or (b) otherwise.
(a) \(\beta = E\)
(b) \(\beta\) is the domain of the head of the chain of \(\alpha\).

(ii) \(\alpha\) is an anaphor or pronominal and \(\beta\) is the least CFC containing \(\tau\) for which there is an indexing \(J\) BT-compatible with \((\alpha, \beta)\).

The definition and the licensing condition above seem rather complicated. In the remainder of this paper, only Condition A is crucially relevant for our discussion. For reasons of simplicity, let us state it as in (10) in using the terms of Chomsky (1986a):

(10) An anaphor must be bound in its governing category

The notion of governing category is defined as follows:

(11) The governing category for an anaphor \(\alpha\) is the least complete functional complex (henceforth, CFC) containing a lexical governor and a possible binder of \(\alpha\).

According to Chomsky (1986a), a category \(\alpha\) is a complete functional complex iff all grammatical functions compatible with its heads are realized in it.

Chomsky (1986b) is an ambitious work to give an unified account for the theory of government and bounding. The intuitive idea is
that certain categories in certain configuration are barriers to
government and to movement (application of the general rule of
Move-α). It is suggested that one barrier suffices to block
government, whereas more than one barrier inhibits movement in a
graded manner.

In the first place, let us take a look at how to define a barrier
which takes a crucial role in defining government and Subjacency:

(12) 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, γ ≠ IP.
Here γ is limited to maximal projections and this is so in all
of the following definitions. A blocking category(BC) is defined in
terms of L-marking and domination:

(13) γ is a BC for β iff γ is not L-marked and γ dominates
β.
L-marking involves θ-government (for the definition of government
see (16)) by a lexical category. Chomsky(1986b) proposes that the
definition of domination is as in (14):

(14) α dominates β only if β is dominated by every segment
of α.

According to (14), domination of β by α requires that every
occurrence of α must dominate β. Let us now examine rather briefly
how this definition actually works. See the following:

(15) ... (ₐ₁ α ₐ₂ ... ) ...

In (15), α is adjoined to A, a maximal projection.³ Chomsky(1986b)
proposes that a maximal projection, XP, is divided into two parts and
each occurrence of XP created by adjunction is called a segment of
XP.⁴ Hence A₁ and A₂ are segments of the same maximal projection of A.
In this case $\alpha$ is not dominated by $A$, since $A_2$ does not dominate $\alpha$.

Then turn to the definition of government.

(16) $\alpha$ governs $\beta$ iff $\alpha$ $m$-commands $\beta$ and there is no $\tau$, $\tau$ a barrier for $\beta$, such that $\tau$ excludes $\alpha$.

As illustrated, government is defined in terms of $m$-command, barrier and exclusion. The former is a restricted version of $c$-command.\footnote{The definition of $m$-command we adopt is illustrated in (17):}

(17) $\alpha$ $m$-commands $\beta$ only if $\alpha$ does not dominate $\beta$ and every $\tau$, a maximal projection, that dominates $\alpha$ does not exclude $\beta$.

With this definition of $m$-command in mind, let us consider the structure in (18)

(18) \ldots [A_1\alpha (A_2 \ldots \delta \ldots \beta)] \ldots

This is an adjunction structure with $\alpha$ adjoined to $A$, a maximal projection, headed by $\delta$. $\beta$ is the complement of $\delta$. Here $A$ dominating $\beta$ does not exclude $\alpha$. Then (17) allows $\beta$ to $m$-command $\alpha$, since $\beta$ does not dominate $\alpha$ and every maximal projection dominating $\beta$ does not exclude $\alpha$.

Finally let us turn to the ECP, which says that a nonpronominal empty category must be properly governed. Chomsky's (1986b) definition of proper government includes the notion of $\theta$-government and the antecedent government that are rather different in nature; the former expresses a relation between a zero-level category and a maximal projection while the latter concerns the relation between the two maximal projections. This is unfavorable both conceptually and theoretically.

The ECP proposed in Chomsky (1986b) cannot explain the ungrammaticality of examples involving super-raise as in the following:
(19) *A man, seems there to be killed t.

If we construe the ungrammaticality in the case of (19) as a violation of the ECP, it follows that $\theta$-government does not suffice for proper government of an A-bound trace. Chomsky argues that if we eliminate $\theta$-government from the definition of proper government, we can account for the impossibility of raising in (19). If this is correct, as mentioned in the onset of the present chapter, we can regard the ECP simply as a chain phenomenon. This possibility, which is suggested by Chomsky, is restated in Takano (1988) as follows:

(20) Each link of a chain must be in an antecedent-government relation.

Let us adopt this statement and suppose that the proper government is defined in terms of the antecedent-government.

Lasnik and Saito (1984) argues that, when an argument undergoes wh-movement, only the initial trace is subject to the ECP. On the other hand, as for the wh-movement of an adjunct, every trace left behind by the movement is subject to the ECP. Assuming this is correct, Chomsky (1988) argues that this difference between an argument and an adjunct can be attributed to the property of chains. Setting aside the detailed analysis, the essence of his proposal is that the intermediate traces involved in an A'-chain of an argument must be deleted at LF and those of an adjunct must be present at the level. Furthermore, he claims that $\tau$-marking takes place anywhere in derivation and the checking of $\tau$-features is applied to the final output of the LF-component. With the introduction of these concepts into the framework, the discrepancy between an argument and an adjunct in question follows. For more discussion, see Chomsky (1988).

3. On Reflexives

In this chapter, we will give an account for the distribution of reflexive pronouns presented in the first chapter.
3.1 A Treatment of Reflexives

Lebeaux (1983) observes that reflexives can appear only in properly (lexically)-governed position. Assuming that this is correct, though our version of the principle does not involve the notion of lexical government as mentioned above, it seems valid to say that a reflexive must be moved somewhere at LF with leaving a trace which is subject to the BCP.

We adopt here the framework proposed in Pica (1987) which mainly concerns anaphors in Danish and Icelandic. He claims that an anaphor is an unsaturated argument at S-structure in that it has no fixed referent and it must be saturated (in other words, assigned some referential feature) by its antecedent at LF under the grammatical relation of government. Our attention here is limited to reflexives. So, to clarify, let us state his proposal as follows:

(21) At LF, a reflexive pronoun must be governed by its antecedent to be licensed.

Now let us examine how this system works in explaining English data. First consider the case in (22) with its associated S-structure (23):

(22) John likes himself.

(23) \[ \{ r \text{John}, \{ \text{v} \text{likes himself} \} \} \]

In (23) John does not govern himself, since the barrier VP intervenes between these two elements. So, according to (21), the reflexive must moves to the place where it is governed by its antecedent at LF. Following Pica, let us assume that the LF-movement of reflexives involved proceeds via adjunction operation. Thus, the structure in (23) will be mapped to an LF-representation in (24):

(24) \[ \{ r \text{John}, \{ \text{v} \text{himself}, \{ \text{v} \text{likes} t_1 \} \} \} \]
In (24), the reflexive *himself* is adjoined to VP and at this site it is governed by the antecedent. If we posit a structure like that in (24) for the sentence with a reflexive, we could claim that at the relevant abstract level, the English reflexives and the reflexive clitics in Romance languages are represented in exactly the same way. Further the following examples seem to serve as a piece of confirmation of the present analysis:

(25)a. John's self-destruction
   b. John's self-removal from the race
   c. John's self satisfaction \(\text{(Lebeaux, 1983)}\)

Abstracting away the detailed analysis of these cases, it seems that in deverbal nominals, reflexives might appear in the position corresponding to the place where *himself* appears in (24):

Along the lines above, consider the following example:

(26) John\(_1\) told Fred\(_2\) about himself\(_{1/2}\).

Here *himself* allows to be bound both to the subject *John* and the object *Fred*. In the system just sketched, this means that *John* and *Fred* govern the anaphor simultaneously. Consider its LF-representation:

(27) \(\text{\(t_1\text{John}_1\ (v_r\text{himself}_{1/2}\ (v_r\text{told Fred}_2\text{ about } t_{1/2})\ )\ )}\)

Recall the definition of \(m\)-command in (16); in (27), both *John* and *Fred* \(m\)-command *himself* and the higher VP, a segment of the maximal VP, would not function as a barrier. Then it follows that *John* and *Fred* governs the reflexive.

Let us turn to the case involving a typical SSC-effect:

(28) *John\(_1\) expects Mary to like himself\(_1\).*

The LF-representation corresponding to (28) might be as follows:
(29) \( {\text{r} \text{John}, {\text{r} \text{himself}, {\text{r} \text{expects} \; {\text{r} \text{Mary to} \; {\text{r} \text{t}_1 \text{ like} \; {\text{r} \text{t}_1}}}}}} \)

To be licenced, the reflexive \text{himself} first adjoins to the lower VP and then moves up to adjoin to the matrix VP. The initial trace of \text{himself} should be identified as a variable, since it is locally \text{A'-}
bound. One problem arises here; the structure in (29) violates the Condition C of the binding theory (a strong crossover effect), since the variable \text{t}_1 is A-bound by the matrix subject \text{John}. This is a
wrong prediction, however. Note that this argument presupposes that a trace locally \text{A'-}bound is always an variable which is an r-
expression sensitive to the condition C of the binding theory. But this cannot be always maintained. In the following examples, the trace \text{t}_1 does not seem to be subject to the condition, though it is locally \text{A'-}bound:

(30) \text{Himself}, \text{John, likes} \; {\text{r} \text{t}_1}. \quad (\text{Barss}(1986))

This example is completely grammatical. Suppose that topicalization is the adjunction to IP, following Lasnik and Saito(1987). Then its corresponding S-structure should be as in (31):

(31) \( {\text{r} \text{Himself}, {\text{r} \text{John,} {\text{r} \text{t}_1 \text{ like} \; {\text{r} \text{t}_1}}}} \)

Here the initial trace is a \text{A'-}bound variable. This variable cannot be an r-expression; though it is A-bound by \text{John}, the strong crossover effect does not show up. Then, what is the property of the trace? It cannot be a pronominal, since it is A-bound in its governing category(-IP). The remaining possibility is that the trace is an anaphor. Let us state this as follows:

(32) The traces of the \text{A'-}chain headed by a reflexive are subject to the condition (A) of the binding theory.

Assume the claim in (32) is correct. We can now account for the
ungrammaticality of the case in (28). In (29), the LF-representation of the sentence, the governing category for the trace t₁ (or, t₁') is the lower IP, since it is the least complete functional complex containing the governor and the possible binder of the trace. Then the trace cannot be bound in its governing category, yielding the violation of the condition (A) of the binding theory.

3.2 On the Distribution of Reflexives

Let us begin this section by considering how the system proposed above works in explaining the cases in which a reflexive appears as the subject of an embedded tensed clause. We repeat some relevant examples below:

(33)a. **John, thinks that himself, will win.
   b. **John, wonders if himself, would win.
   c. **John, didn't know what himself, had to do.

Under the theory of binding proposed in Chomsky (1981) and other similar versions of the theory, sentences like in (33) have been excluded as a violation of the condition (A) of the binding theory; the reflexives involved are free in its governing category. In each of these examples, the governing category for the reflexive would be the embedded IP, since it is the least CFC containing the governor and the possible binder (SUBJECT-AGR element in Infl). But it is rather doubtful to consider an element like AGR in Infl functions as a possible binder which is normally a noun phrase.

Kitagawa (1986) presents some crucial counterexamples to the versions of the binding theory with SUBJECT. Consider the following:

(34)a. Eles, sonharam (consigo, a roubarem galinhas)
   They dreamed with-themselves at stealing-3-PL chickens
   "They saw themselves stealing chickens in their dream."
   b. Eles, deram (consigo, a beijarem as professoras)
   they found with-themselves at kissing-3-PL the teachers
   "They found themselves kissing the teachers."
These examples are gerundive infinitival of Portuguese. In these examples, the reflexive anaphor as the subject of a gerundive infinitival may be bound by the matrix subject despite the clear presence of agreement in the gerundive infinitival. Compare the examples in (34) with those in (35):

(35)a. *Eles, sonharam (que si, tinham roubado galinhas)
they dreamed that themselves had stolen checkens
b. *Eles lamentam (si, terem gasto dihiheiro)
they regretted themselves to have =3=PL spend that money

In both (35a) and (35b), reflexives in embedded subject position cannot be bound by the matrix subjects. These examples strongly suggest that it is not AGR which is responsible for the presence of opacity in (35a,b) and its absence in (34a,b).

If we adopt the hypothesis of LF-movement of reflexives outlined in the preceding section, we can give an account for the data in (33) without recourse to the notion of SUBJECT. Consider (36), the S-structure representation associated with (33a):

(36) (\textit{\textsc{fr}John} (\textit{\textsc{vr}thinks (\textit{\textsc{cr} (\textit{\textsc{fr}himself (\textit{\textsc{fr}will (\textit{\textsc{vr}win})})})}) (irrelevant portions are omitted)

In (36), \textit{himself} cannot be governed by the intended antecedent \textit{John} due to the intervening barriers, the higher VP and the embedded CP. Then the reflexive must move to the higher VP position to be governed by the antecedent at LF. The following structure is the possible LF-representation of the example:

(37) (\textit{\textsc{fr}John} (\textit{\textsc{vr}himself (\textit{\textsc{vr}thinks (\textit{\textsc{cr} (\textit{\textsc{fr}t; (\textit{\textsc{fr}will (\textit{\textsc{vr}win})})})})})

Here we suppose that in the relevant process, reflexives cannot move into the specifier position of CP; the movement proceeds only via adjunction and the substitution operation is not available. If this
is correct, we can easily rule out the structure as an ECP violation; the trace \( t_1 \) is an offending trace, since it cannot be governed by \( \text{himself} \), because of the barrier CP.

One can argue why the specifier position of CP cannot be a hatch for the movement. If the position were available for any cases of A' movement, our statement would be rather \( \textit{ad hoc} \). But this is not the case. Homma (1989) proposes that in the Quantifier Raising (QP) which is a type of A' movement, the quantified NP cannot move into the CP-spec position. In particular, consider the following:

\[ (38) \text{Everyone believes someone is a liar.} \]

In (38), \textit{someone} cannot take scope over \textit{everything}. He assigns the following LF-representation for the intended reading of the sentence:

\[ (39) \left( \left\{ \text{everyone} \right\}, \left\{ \text{someone} \right\}, \left\{ \text{is a liar} \right\} \right) \]

He claims that the raising of the QP \textit{someone} proceeds without moving into the CP-spec position. Hence the trace \( t_2 \) is an offending trace, yielding the ECP-violation, since \( t_2'' \) cannot governs the trace. Further he formally states the reason why the CP-spec position is not available for the QP as follows:

\[ (40) \text{Only the elements that potentially requires SPEC-HEAD Agreement with C(omplementizer) can move into CP-spec.} \]

If this claim is correct, we can somewhat justify our hypothesis that the CP-spec position is not available for the LF-movement of reflexives, since such elements does not require the agreement with C.

Let us now consider the examples where a reflexive is in the prenominal genitive position:

\[ (41)a. \text{John likes himself's parents.} \]
b. *John likes those pictures of himself's friends.

Before entering into the discussion of the ungrammaticality of the cases in (41), we must initially get to know how a noun phrase is constructed.

Following Tomoike(1988) and Takano(1988), we assume the following structure for noun phrases, which is exactly parallel to the structure of clauses in the sense of Chomsky(1986b):

is correct, we can easily rule out the structure as an ECP violation; the trace \( t_z \) is an offending trace, since it cannot be governed by \textit{himself}, because of the barrier CP.

One can argue why the specifier position of CP cannot be a hatch for the movement. If the position were available for any cases of A’-movement, our statement would be rather \textit{ad hoc}. But this is not the case. Hossu(1989) proposes that in the Quantifier Raising \textit{(QP)} which is a type of A’-movement, the quantified NP cannot move into the CP-spec position. In particular, consider the following:

(38) Everyone believes someone is a liar.

In (38), \textit{someone} cannot take scope over \textit{everything}. He assigns the following LF-representation for the intended reading of the sentence:

(39) \[
\{\text{everyone}, \{\text{someone z}, \{t_z', \text{ believes } \{r_z \{v_z \text{is a liar } \}} \}\}\}\]

He claims that the raising of the QP \textit{someone} proceeds without moving into the CP-spec position. Hence the trace \( t_z \) is an offending trace, yielding the ECP-violation, since \( t_z'' \) cannot governs the trace. Further he formally states the reason why the CP-spec position is not available for the QP as follows:

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Let us now consider the examples where a reflexive is in the prenominal genitive position:

(41)a. *John likes himself's parents.
weak violation of the Subjacency. (48a), on the other hand, involves crossing one more barrier. Since the Spec of DP is not projected, DP constitutes a barrier, since it inherits barrierhood from the immediately dominated IP. Then the movement from t, crosses a barrier again. Hence the fact that the case in (46b) is less acceptable than that in (47b) can be accounted for in terms of the double weak violations of the Subjacency.

Let us now go back to the examples in (41). The DP-hypothesis presented here gives the following LF-representation to (41a):

(49) \[ \text{John \{\text{himself}, \text{likes} \{\text{DP \{\text{t1}, \text{parent}\}}\}\}}\]

This structure is ruled out in the same way as that excludes the cases involving a reflexive as the subject of an embedded clause: as defined, the LF-movement of reflexives proceeds via adjunction. Further reflexives cannot move into the specifier position of DP, since the position is not present. Therefore the reflexive must directly move to the matrix VP, since the maximal projection DP is an argument to which adjunction is blocked. Hence t, cannot be properly governed in this structure; the inherited barrier DP intervenes between the trace and the antecedent. Hence we can rule out this example in terms of the ECP, as required.

As I mentioned in chapter 1, the cases in which a reflexive occurs as the subject of an infinitival complement are grammatical, though the acceptability is slightly lessened.

(50)a.?They want themselves to win.
b.?They prefer for themselves to win.

Suppose that in these examples, the infinitival complements are structurally the same. In particular, we posit, following Chomsky (1982), the presence of the null complementizer (null for) assigning a Case to the subject in (50a). It is suggested by Yuji Takano (p.c.) that the oddity observed in these sentences can be attributed to a principle something like the avoid pronoun principle proposed in
Chomsky (1981). That is, for example, the sentence in (50a) is semantically equivalent to They want themselves to win. Then, it is not unreasonable to say that the sentences in (50) are well-formed and their acceptability is slightly lessened due to a pragmatic principle imposing a choice of PRO over an overt expression where possible. Now let us consider the S-structure of the example in (50a):

(51) [T They [vP want [cr [rt themselves to [vP win] ] ] ] ]

In this structure, the reflexive is not governed by its antecedent due to the intervening barriers, the higher VP and the embedded CP. Then the following LF-structure results after the movement of the reflexive.


We have defined in (40) that only the elements which agrees with C, the head of CP, can move into CP-spec. Therefore in (52) the movement must be in one step, yielding the ECP violation on a par with (36). This is, however, a wrong prediction. Now let us stipulate that in (52), the lower IP is somehow L-marked at LF. If this is correct, IP is not a blocking category and it prevents the inheritance of barrierhood by CP. Then there is no barrier between themselves and the trace _t, and the ECP is satisfied.

Now it is needed to consider how the stipulation concerning the L-marking of the lower IP in (52) is maintained and why the relevant process does not hold of the embedded tensed clause in (36). Rivero (1987) has shown that in Modern Greek, raising and passivization are possible from the subject of a finite clause and Exceptional Case Marking may also affect the subject of an embedded finite clause:

(53)a. ἡ ἄνθρωπος, fénonte (cr [rti na dulevon])
the men, seem-3Pl work(Subj)
"The men seem to be working."
b. Ta pedíáí anaménonte (cr [i;ti na fígun])
the children are expected go(Subj)
"The children are expected to go."

(54) I Giánni théli (cr [i;rti Maríá na exétási tin kóri mu])
the Gianni wants the Maria-Acc examines the daughter my
"Gianni wants Maria to examine my daughter."

These examples are problematic for *Barriers* framework, as defined in Chomsky(1986b), since the embedded CP ought to constitutes barriers for the (proper) government of the embedded subject position. Rivero proposes the following mechanism to account for the government of the embedded subject positions of the examples in (53) and (54): The matrix verb θ-marks its CP complement and the index percolates to C°; C° and I° share the index assigned by the matrix V and then the index percolates to IP; I° and the subject IP are coindexed. Rivero argues that in (53) and (54) the embedded IP is L-marked by the matrix verb since C° and IP agree and CP is θ-marked by the verb.

Now we tentatively suppose that this process is also applicable in English. It is well-known that in English, raising and passivization from a CP-complement are impossible and the ECM cannot affect beyond a CP node. Hence the process cannot be applied at S-structure in English, unlike Modern Greek. Let us assume that at S-structure the presence of a complementizer prevents the index which V assigns to its complement CP from percolating to C°, since the complementizer has its own fixed index. The complementizer is deleted at LF with its index and then the index assigned by V can percolate to C°. Further we suppose that C° agrees with a nonfinite Infl, not with a finite Infl. Therefore, the IP involved in a nonfinite CP complement is L-marked at LF, while that in finite CP complement is not L-marked. Though the elaboration of the system is left to the future research, but the analysis seems to be on the right track.

The following examples seem to support our claim that the L-marking of the embedded IP is crucially related to the well-formedness of the structure in (52):
(55)a. *They want very much for themselves to win.
b. *They prefer very much for themselves to win.

These examples sharply contrast with those in (50). The only difference is that in (55) the infinitival complements are extraposed. In the present analysis, if the CP-complement involved in each sentence is not L-marked, we can rule out these sentences, since the LF-movement of the reflexive yields the ECP-violation. The following paradigm in Oka (1988) illustrates that an extraposed clause is not L-marked:

(56)a. Why do you believe [that John left t]
b. *Why do you believe at that time (that John left t)

The extraction of the adjunct is banned from the extraposed complement. Suppose that the extraposed clause is no longer L-marked. Then the sentence in (56b) is in violation of the ECP.

The following example illustrates the same point.

(57)*We brought some friends for ourselves to meet.

(Lebeaux (1983))

As the sense reveals, the sentence in (57) is ambiguous in two ways: (i) when we interpret the infinitival clause as a purpose clause the sentence means, "we brought some friends in order to meet.", (ii) when we interpret the infinitive as a relative clause, it means "we brought some friends whom we should meet." The LF-structures in (58) correspond to each meaning, respectively:

(58)a. \[ \text{We (v ourselves) (v (v brought (\#some friends))) (c\#Opz (c\#for (t1 to meet t2)))} \]
b. \[ \text{We (v ourselves) (v (v brought (\#some friends (c\#Opz (c\#for (t1 to meet t2)))))}} \]
In either case, the CP, the purpose clause in (58a) and the relative clause in (58b), is not L-marked and hence the barrier for \( t_1 \).

First let us consider the structure in (58a). As in (52), the reflexive must move directly to the matrix VP from its S-structure position. Note that in this movement the adjunct to the adjunct (the purpose clause) is not available. Then this structure violates the ECP, since the existence of a barrier CP blocks the government of \( t_1 \) by ourselves. Next our attention should be paid to the structure in (58b). Like the case in (58a), the movement should be in one step to the matrix VP-position, since adjunction to a relative clause would not be allowed. Then the structure violates the ECP.

Additionally, this structure seems to violate the binding theory. Johnson (1987) argues that the head noun of a relative clause can function as a possible binder. This is illustrated by the following example:

(59) *They read \( \_1 \) they, theorems \( \_1 \) that \( \_1 \) books about themselves explained \( \_1 \)"

According to him, the ungrammaticality of the sentence will follow, if the head noun of the relative clause counts as a possible binder in determining the governing category for the anaphor involved; the DP will be the governing category of themselves since it is the minimal CFC containing the governor and the possible binder of the anaphor. Then the sentence in (59) violates the condition (A) of the binding theory since the reflexive themselves is free in its governing category.

Assume that this line of reasoning is correct. Then let us go back to the discussion of (58b). Recall we have defined that the variable which is a tail of the chain headed by an anaphor behaves like an anaphor itself. Then the LF-representation under consideration violates the Condition (A) of the binding theory; \( t_1 \) is an anaphoric variable whose governing category is the DP, the complement of the verb, as in (59), and the variable is free in its governing category. Then we can conclude that the sentence in (57) may violate both the ECP and the binding theory if the infinitive involved is interpreted
as a relative clause.

ECM-constructions allow reflexives to appear in the subject position of infinitival complements:

(60) They believe themselves to be innocent.

The structure in (61) is the LF-representation corresponding to (60):

(61) [They themselves believe [to be honest]]

This structure involves no violation of the ECP; themselves governs t₁, since the former m-commands the latter and there is no barrier intervening them.

Now let us consider the following example:

(62) John thought that [pictures of himself would be on sale]

The referential possibility in this case has been accounted for by the \( i \)-within-i Condition. Notice that the condition refers to the notion of SUBJECT, where an AGR element is regarded as a possible binder in determining a governing category. This possibility of the explanation is not available for our framework, since one of our purposes to assume the LF-movement of reflexives is the elimination of the notion. Then how can we account for the grammaticality of this example? First see the structure in (63):

(63) [John himself thought [of pictures would be on sale]]

This is the structure corresponding to (62), immediately after the LF-movement of the reflexive. Himself first adjoins to NP and then moves up to the matrix VP. If the \( \tau \)-marking can take place anywhere in a derivation (see chapter 2), the initial trace can be properly governed by the reflexive itself in the process of the
movement (or the intermediate trace $t'_r$). Note however there is no way to positively mark the intermediate trace. But this does not affect the grammatical status of the sentence, since the moved reflexive is an argument. That is, only the initial trace is subject to the ECP. Therefore the structure in (63) is correctly predicted to be well-formed.

Finally let us consider the fact that in the case of long distance binding, a reflexive allows to split its antecedent. This is illustrated in (64):

(64) John$_1$ told Mary$_2$ that there were pictures of themselves$_{1/2}$ inside.

In this sentence, the referential content of themselves are John and Mary. How can this be possible? The present theory assigns the following LF-representation to (64):

(65) [$_r$John [$_r$themselves [$_r$told Mary [$_r$that [$_r$there [$_r$were [$_r$[$_r$[$_r$[$_r$[$_r$[$_r$[$_r$[$_r$pictures of t] inside]]]]]]]]]]]

The reflexive first adjoins to the NP and then moves to the matrix VP position. The initial trace $t$ is properly governed by the intermediate trace $t'$ or the reflexive itself when it adjoins to NP, and in turn the intermediate trace is irrelevant for the ECP. In (65), themselves is governed by both John and Mary. Then it is possible for the reflexive to refer to both subject and object simultaneously.

4. On Reciprocals
4.1 An Treatment of Reciprocal Pronouns

It is widely accepted in generative grammar that the reciprocal pronouns are to be classified as anaphors alongside of reflexives. While we believe that what the extensive research on this assumption tells us is sometimes correct, we do not think it is entirely so. Most importantly, the binding theory cannot express the semantic character of reciprocal sentences; Chomsky (1973), for example, posits
the deep structure in (66b) or (66c) for the surface structure in (66a):

(66)a. The boys like each other.
    b. The boys each like the other.
    c. Each of the boys like the other(s).

The well-known indexing strategy which states the formal anaphoric relation by indices gives (66a) the representation as follows:

(67) The boys, like each other.

Note however this cannot express the meaning described by (66b) and (66c). Further Chomsky (1981) claims that the sentence in (66a) would be interpreted as follows at LF:

(68) for each X, X one of the boys; x likes x'(x ≠ x')

Following this suggestion, let us suppose that a representation like in (66b) and (66c) holds at relevant interpretative level, LF. Our intuition concerning the meaning of the sentence is that each picks out individuals from among the set of boys while the other picks out members of the set disjoint from that picked out by each. Hence in some sense the other is bound by each of the boys, the other have independent referent, since it must always refer to the individuals distinct from those picked out by each.

4.2 Each-movement at LF: the Framework proposed in Heim, Lasnik and May (1988)

The argument above seems to suggest that the structure of the the reciprocal pronoun each other is not simple but complex; it contains both an anaphoric (each) and a non-anaphoric (other) part and these two elements appear to be continuous at S-structure but discontinuous at LF. Then, at that level, a reciprocal sentence have a representation like that in (66b,c).
This leads us to the assumption of the LF-movement of each in each other at LF. Here we adopt the relevant framework proposed in Heim, Lasnik and May (1988); henceforth, HLM). They claim that the element each is removed from its surface position and adjoined at LF to its plural antecedent phrase. Under this assumption, the LF-representation of the sentence in (66a) will be as follows:

(69) \([\_NP \_NP\text{the boys}] \; \text{each}_2] \; \text{z like} \; [\_NP\text{other}]\]

In (69), \(e\) stands for the trace of each. This structure formally expresses the meaning of the reciprocal construction discussed in the preceding section. The treatment of the derived subject phrase in (69) seems to be parallel to that of the noun phrase the boys each in (66b). In the structure each picks out individuals from the set of the boys (the index 2 stands for those who are picked out by each) and (e other) picks out individuals distinct from those chosen by each (the index 3 denotes this set). According to HLM, the moved each serves as an distributor (an operator-like element), the function of which is to distribute the elements contained in the set described by the NP to which it adjoins. To make our discussion more clear, let us consider another case in (70) with its associated LF structure in (71):

(70) (John and Mary) likes each other

(71) \([\_NP \_NP\text{John and Mary}] \; \text{each}_2\; \text{z likes} \; [\_NP\text{other}]\]

(i) John ------------ Mary
(ii) Mary ------------ John

The point can be seen clearly in the LF-representation in (71). If each selects John, then (e other) must refers to Mary, and vice versa. As for the referential character of (e other), HLM proposes that it is an r-expression. Note however that (e other) is in some sense bound by an antecedent each construction, since its referent must be involved in the group-denoting antecedent of each. We do not intend here to seek why this is the case, but at least we can imagine
that the trace of each has the information of the content of the set
to which each adjoins and the element selected by each, then the trace
commands (e other) to choose the element distinct from that picked
out by each from the same set.

With the status of the trace of each, HLM assumes that it is an
anaphor which is susceptible to the condition (A) of the binding
theory. But why is this the case? HLM themselves do not give any
justification of the claim. Here recall our statement in (32),
repeated below in (72):

(72) The traces of the A'-chain headed by a reflexive are subject
to the condition (A) of the binding theory.

Now suppose that this claim is also true for the traces of each; the
traces of anaphor, not limited to those of reflexives, are them-
selves anaphors. The assumption that the trace of each is anaphoric
is required to rule out the examples involving the violation of the
S(pecified) S(ubject) C(ondition):

(73) They, want us to like each other.

The LF-representation associated with (73) is the following:

(74) [ (They, eachz) z want us to like (ez other ) z

If e, the trace of each, is an anaphor, this structure violates the
condition (A) of the binding theory since the trace is A-free in its
governing category: the governing category of the trace is the IP
the infinitival complement of want (to say exactly, the infinitival
complement of the verb is an CP, so the GC for the trace is the IP
dominated by the CP) since it is the least CFC containing the governor
(perhaps other) and the possible binder us.

4.3 each-movement and the ECP

The main topic of this paper is to give an account for the dis-
tributional differences between reflexives and reciprocal each other. In chapter 3, we have reduced the distributional restriction on reflexives to the Empty Category Principle on the assumption that a reflexive moves to be governed by its antecedent at LF. Now recall that each other can appear in the positions where the occurrence of reflexives are blocked. If the LF-movement of each suggested above is correct, now there arises a question how the movement is not regulated by the ECP.

The solution we give here is intuitively that the relevant trace is always properly governed in the structure of DP and, then, the movement seems apparently irrelevant to the ECP. In order to proceed, it is indispensable to know the internal structure of each other, but, unfortunately, we have no direct clue of knowing that. We have claimed each other is continuous at S-structure and discontinuous at LF. We tentatively suppose that this continuity at S-structure reflects its internal structure. Then assume that the internal structure of each other is something like in (75a) or (75b).

(75)a. \[
\text{DP} \left( \text{IP} \left( \text{n\text{e}ach \left( \text{n\text{e}other} \right) } \right) \right) \]

b. \[
\text{DP} \left( \text{IP} \left( \text{n\text{e}ach \left( \text{n\text{p}other} \right) } \right) \right) \]

In (75a) each is in spec position of NP and it adjoins to NP in (75b). The choice between the two structures is not important here. After the LF-movement of each, the structure are converted into as follows, respectively:

(76)a. \[
\ldots \text{each} \ldots \left( \text{DP} \left( \text{IP} \left( \text{n\text{p}t \left( \text{n\text{p}t} \left( \text{n\text{e}other} \right) } \right) \right) \right) \right) \]

b. \[
\ldots \text{each} \ldots \left( \text{DP} \left( \text{IP} \left( \text{n\text{p}t \left( \text{n\text{p}t} \left( \text{n\text{p}other} \right) } \right) \right) \right) \right) \]

In both of the structures, each first adjoins to NP. Then the intial trace can be properly governed. Note however the intermediate trace cannot satisfy the ECP, since the DP is always the barrier assuming the specifier of DP cannot be projected. Then we suppose that the intermediate trace is somehow deleted until we reach the final output of LF. Though we leave the justification of this claim in future
research, we believe that the reasoning is essentially correct.

If the each-movement at LF always satisfies the ECP, we can now account for the fact that each other occurs in a position not properly-governed position where reflexives cannot appear. Then each other can appear freely in the subject position of embedded tensed and infinitival clause and in the same position of DPs, when its antecedent is plural and the binding condition is not violated.

The character of each other that it is not allowed to have a split antecedent remains unsolved. The present analysis of each other can make rather clear explanation of the phenomenon. Consider the following:

(77)*John told Mary that there were some pictures of each other inside.

The candidates for the LF-representation of (77) is the following two structures:

(78)a. ( (John) each) told Mary that there were some pictures of (e other) inside.
   b. John told ( (Mary) each) that there were some pictures of (e other) inside.

Each can adjoin either to John and Mary, then it cannot refer to both of them simultaneously. This explain the fact that the reciprocal pronoun disallow split antecedents.

4.4 The Italian Reciprocal l'uno...l'altro

We have just argued that the each-movement in question apparently irrelevant to the ECP, since the requirement of proper government is always satisfied in the DP-structure of each other itself. This claim largely depends on the assumption that each and other constitutes a single category, namely DP. Imagine that there is a reciprocal pronoun which consists of A and B, where A corresponds to each and B to other, respectively. Then further suppose that A and B
must be discontinuous at S-structure. This amounts to saying that A and B cannot form a single category. As for this kind of reciprocals, our framework predicts that the LF-movement of A must be regulated by the ECP. The existence of reciprocals like this seems to justify our assumption concerning each other. But does this type of reciprocals indeed exist? Yes.

Belletti (1982) observes that the Italian reflexive l'uno...l'altro is the type of reflexive we have just imagined. The elements must be discontinuous at S-structure unlike the English counterpart each other and, indeed, its distribution seems to be regulated by the ECP. First consider the following:

(79)a. I miei amici parlano l'uno dell'altro
   "my friends speak one-of-the-other."
b. Solo quella volta hanno criticato l'uno le idee dell'altro
   "Only that time they criticized one-the-ideas-of-the-other."

As shown in (79), the two members of the construction are separated either by a preposition or a noun. (80) shows that they can also be separated by an adjective:

(80) I miei amici rimasero l'uno seduto accanto al l'altro.
   "my friends remained one-sitting-next-to-the-other."

Belletti suggests that this property of the construction is not accidental, but rather, it is a characterizing property of the construction. As a matter of fact, when two elements are not separated by anything and they consequently happens to be immediately adjacent to each other, the resulting sentences are unacceptable, as shown in (81):

(81)a.*I miei amici parlano dell' uno (o) l' altro
   b.*Solo quella volta hanno criticato le idee dell' uno(o)
       l' altro

The series of observation above lead him to the conclusion that
the sequence l’uno...l’altro is structurally represented as in (82):

(82) \[ x_F \{ x_F \{ l \text{uno} \} \} \cdots x_F \{ l \text{altro} \} \]

This structure shows that l’uno adjoins to the maximal projection in which l’altro is involved. Let us adopt this structure. Then further assume that in this case, at LF, l’uno adjoins to its plural antecedent alongside of each-movement we have proposed in the preceding sections. Along this line, the LF representation of the construction will be as follows:

(83) \[ x_F \{ x_F \cdots \} l \text{uno} \} \cdots [x_F \{ x_F \cdots l \text{altro} \} \]

Here we suppose that t, the trace of l’uno, is subject to the ECP. This assumption draws an interesting consequence. The present analysis gives, for example, the sentence in (79a), the following LF-structure:

(84) \[ x_F \{ x_F \{ x_F \{ \text{I miei amici} \} l \text{uno} \} \} \( x_F \{ x_F \{ x_F \{ \text{parlano} \} \} \}

\]

In this structure, the initial trace t is properly governed, since l’uno can move via the adjunction to VP. The DP is not possible adjunction site for the movement due to the fact that it is an argument of the verb.

Then let us consider the following:

(85) I miei amici pensavano (che \{ x_F l \text{uno} \} \{ x_F l \text{le photo del l’altro} \} saranno pubblicate sul giornale.

“My friends thought that pictures of each other will be published in the newspaper.”

According to Belletti’s judgement, this example is completely ungrammatical. This can be easily accounted for in our framework. See the following LF-representation associated with the sentence:
(86) (tr [sp l miei amici] l'uno) (vrt' [vppensavano [cr (tr [vrt le photo del l'altro) saranno pubblicate sul giornale]]] ])

Here the initial trace t cannot satisfy the ECP because of the existence of the barrier, CP. Then the ungrammaticality of the example can be correctly characterized.

5. Summary

This paper has discussed the main issues concerning the distributional differences between reflexives and reciprocals. We have been based on Lebeaux's (1983) observation that reflexives are subject to the ECP and the reciprocal pronoun each other is irrelevant to the principle. We have proposed that both reflexives and the reciprocal pronoun undergo movement at LF, but they move rather differently to create gaps between sentences involving reflexives and those involving the reciprocal in representation at LF. We demonstrated that the distributional differences between these two types of anaphors follow from the differences in representation at LF.

NOTES

*I owe much to a collaborative research with Jun Abe, Daisuke Inagaki and Seiji Iwata, the result of which was reported at the 9th annual meeting of the Tsukuba English Linguistic Society held at University of Tsukuba on October 29, 1988. I am also indebted to Toshifusa Oka, Yuji Takano and Shinsuke Homma for their valuable comments and criticism. I am also grateful to Ukio Hirose for his comment from a semantic view point. Special thanks goes to Minoru Nakau and Nobuhiro Kaga, who read the earlier version of this paper and pointed out some inadequacies involved. Finally I express my thanks to Masaharu Shimada, Kazue Takeda and Keiko Miyagawa for their insightful suggestions.

'Lebeaux (1984) claims that an anaphor is locally bound if it is bound within the minimal NP or S containing it and its governor.
Otherwise, it is nonlocally bound. He observes that only nonlocally bound reflexives allow split antecedents:

(i) a. John told Mary that there were some pictures of themselves inside.
    b. John told Mary that as for themselves, they should leave immediately.

(ii) a. *John told Mary about themselves.
    b. *The boys introduced the girls to themselves.

This contrast is a puzzle for our analysis, since our theory predicts that in either case, the reflexive allows to split its antecedent. It is doubtful, however, that the sentences in (i) and those in (ii) contrast so keenly as illustrated. I believe that the difference in acceptability is not a matter of syntax, but, rather, it is a matter to be captured in pragmatics.

2Chomsky(1986b) suggests IPs and NPs are typical CFCs.

3According to Chomsky(1986b), adjunction is possible only to a maximal projection which is a nonargument.

4Lasnik and Saito(1988) proposes that adjunction creates a new node.

5Chomsky(1986b) defines c-command as follows:
   \( \alpha \) c-commands \( \beta \) iff \( \alpha \) does not dominate \( \beta \) and every \( r \) that dominates \( \alpha \) dominates \( \beta \).

4Original definition of m-command is this:
   \( \alpha \) m-commands \( \beta \) iff \( \alpha \) does not dominate \( \beta \) and every \( r \) a maximal projection that dominates \( \alpha \) dominates \( \beta \).

7For more discussion, see Chomsky(1986b).

8As illustrated in (3), each other is better than reflexives in the same position. We interpret this as follows: The principle which explains the oddity of the example in (50) is applicable to a given pair of semantically equivalent sentences, one involving a lexical expression and the other involving a PRO. Here the sentence They want each other to win and They want to win are different in meaning.
Then the pragmatic principle in question does not work here.

"We adopt Chomsky's (1986b) proposal that adjunction to IP should be banned since the category is defective in some sense.

"If adjunction to an adjunct were possible, we could not explain the ungrammaticality of the following example:

(i) a. to whom did they leave (before speaking to t)?
    b. who did they leave (before speaking to t)?

According to Chomsky (1986b), in these cases the adjunct is a BC and a barrier, and the IP inherits barrierhood. Therefore two barriers are crossed and the sentence violates the Subjecency. If adjunction to an adjunct were permissible, we could not rule out these cases.

"As mentioned in fn. 1, split antecedents are not allowed for reflexives in case of local binding in Lebeaux's term.

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