

The Structure of *Selo* and Its Implication for Binding Theory*

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I suggest that *selo* in Korean has a complex structure [*pro selo*] and that [*pro selo*] is a pronominal in terms of binding theory. This can give a natural account for long distance dependency, split antecedence and the lack of requirement for the c-commanding antecedent of *selo*, and its asymmetry of readings in local and nonlocal domains in terms of binding theory as reported here.

Key words: binding, reciprocal, pro, pronominal, local, nonlocal

1. Introduction

Hoji (1997ab, 2003) originally claims that *otagai* in Japanese is not an anaphor in view of the fact that it allows long distance binding, split antecedence and that it does not require a c-commanding antecedent. He thus suggests that *otagai* is part of a structure including a pronominal element *pro*, from which these properties of *otagai* follow. When it comes to Korean, which is typologically akin to Japanese, the Korean counterpart of *otagai*, *selo* ‘each other’ has been analyzed as a local anaphor (see Yang 1984 among others) and this view has been taken more or less as a standard one. Now given the current status of research on a local anaphor, the following claims should entail if *selo* is a local anaphor (see Hoji 1997a, b):

- (1) a. *Selo* is locally bound by the antecedent.
- b. *Selo* cannot take split antecedent.

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As one can see, the examples below in (2-3) apparently indicate that *selo* is locally bound and requires a c-commanding antecedent, hence apparently confirming the standard view.

- (2) [John-kwa Mary]_i-ka selo_r-lul coahanta.
 [John and Mary]-NOM each other-ACC like
 'John and Mary]_i like each other_i.'
- (3) *Selo_r-ka [John-kwa Mary]_i-lul coahanta.
 each other-NOM [John and Mary]-ACC like
 *Each other_i likes John and Mary_i.'

As one further proceeds, the plot thickens, however. As pointed out by Chung and Park (1998), the standard view on *selo* is difficult to maintain, given that it can enter long distance dependency with its antecedent, take split antecedent and does not need to be c-commanded by the antecedent. In fact, the example below in (4) shows that *selo* can enter long distance dependence relation with the antecedent *John-kwa Bill*, 'John and Bill' thus without regard to its local domain of governing category.¹⁾

- (4) [John-kwa Bill]_i-i [_{CP}Mary-ka selo_i-lul coahanta-ko]
 [John and Bill]-NOM Mary-NOM each other-ACC like-COMP
 sayngkakhanta.
 think
 'John thinks Mary likes Bill and Bill thinks Mary likes John.'
 'John_i thinks Mary likes him_i and Bill_j thinks Mary likes him_j.'
 '[John and Bill]_i think that Mary likes them_i.'

In addition, the example below in (5) indicates that *selo* can have a split antecedent, which is characteristic of a pronominal but not an anaphor, as

1) I will assume the following definition of governing category throughout, otherwise specified. α is the governing category for β if and only if α is the minimal category containing β and a governor of β , where $\alpha = \text{NP or S}$

(A) An anaphor is bound in its governing category.

(B) A pronominal is free in its governing category.

(C) An R-expression is free. Chomsky (1981, p. 188)

shown below in English in (6).^{2,3)}

- (5) John_i-i Mary_j-ekey [CPaphulo selo_{i+j}-ka te
 John-NOM Mary-DAT future each other-NOM more
 yeolsimhi il-ul hayyahanta-ko] malhayssta.
 hard work-ACC should do-COMP said
 'John_i told Mary_j that they_{i+j} should work harder in the future.'

- (6) a. John_i told Bill_j that they_{i+j} should leave.
 b. *John_i told Bill_j that each other_{i+j} should work harder.

Furthermore, the example in (7) explicitly shows that *selo* does not need a c-commanding antecedent, which is again characteristic property of a pronominal.

- (7) Selo_i-ka cohta-myen, [John-kwa Mary]_i-nun
 each other-NOM ok-if [John and Mary]-TOP
 hamkkey wato cohta.
 together may come
 'If it is ok for them_i, [John and Mary]_i may come together.'

Given the examples above in (4-5) and (7) that clearly show that the characteristic properties of a (local) anaphor are apparently violated, one is persuaded to believe that *selo* is not an anaphor, let alone a local anaphor. Throughout I will gloss *selo* as *each other* only for convenience sake.

2. The Structure and Interpretation of *Selo*

With our preliminary discussion of the status of *selo* in mind, now let us turn to its syntactic structure and interpretation. First when it comes to the structure of *selo*, I will essentially adopt the structure in (8) as orig-

2) One may wonder whether the unacceptability of the example in (6b) has to do with the fact that *each other* is long distance bound by the antecedents. The example below, although deviant, indicates that the unacceptability in (6b) is attributed to the fact that *each other* cannot take split antecedents.
 ?The men_i demanded that each other_i be arrested.

3) The example in (5) also has the reading of 'John_i told Mary_j that he_j should work harder and that she_j should work harder.'

inally proposed by Hoji (1997a, b, 2003) for Japanese counterpart *otagai* such that long distance binding in (4), split antecedence in (5) and the lack of requirement in (7) for the c-commanding antecedent of *selo* are essentially attributed to the existence of *pro*.

(8) [_{NP} *pro* [_N *selo*]]

Next, let us turn to the interpretation of *selo*. It will be shown that the structural representation of *selo* in (8) will be further justified in its possible interpretations in binding theoretic local and nonlocal domains. Before I further proceed, I will briefly discuss Hoji (1997b) regarding the interpretation of the reciprocal *otagai* in Japanese. Hoji (1997b, p. 34) reports that *otagai* in Japanese in principle can admit cross reading, parallel reading and coreference reading in a configuration as below.

(9) [John and Bill]_i V [_{pro_i} *otagai*]

To make explicit what he means by these readings, I will repeat the example above in (4) below in (10).

(10) [John-kwa Bill]_i-i [_{CP} Mary-ka *selo*_i-lul coahanta-ko]
 [John and Bill]-NOM Mary-NOM each other-ACC like-COMP
 sayngkakhanta.
 think
 'John thinks Mary likes Bill, and Bill thinks Mary likes John.'
 'John_i thinks Mary likes him_i and Bill_j thinks Mary likes him_j.'
 '[John and Bill]_j think that Mary likes them_i.'

The first reading above in (10) is cross reading, whereas the second and the last readings are parallel reading and coreference reading, respectively. Hoji (1997a, b) further claims that cross reading and parallel reading are an instance of bound variable reading whereas group reading is an instance of coreference.⁴⁾ It should be noted that coreference is not sensitive

4) Hoji (1997) essentially adopts the definition of bound variable reading in Partee (1978, p. 78-80).

An anaphoric relation between two nominal expressions is either (i) coreference or (ii) bound variable anaphora. (i) When each of the two nominal expressions is used to refer

to structural relation as formulated in terms of c-command in contrast to bound variable reading which is subject to c-command as shown below in (11-12).⁵⁾

- (11) a. His_i mother likes John_i.
 b. John_i likes his_i mother.
- (12) a. *His_i mother likes everyone_i.
 $\forall x$, x a person, x 's mother likes x .
 b. Everyone_i likes his_i mother.
 $\forall x$, x a person, x likes x 's mother.

Hence although *his* can take *John* as its antecedent via coreference in (11a), the same expression in (12a) cannot be construed as a bound variable with *everyone* as its antecedent.

Now back to the readings of *selo*, I crucially observe that it admits only cross reading when it is locally bound by the antecedent as in (2), in terms of binding theory, whereas it admits cross reading, parallel reading and coreference reading when it is long distance bound as in ((4)=(10)).⁶⁾

The present observation, if correct, suggests that *selo* somehow behaves differently from the Japanese counterpart *otagai* regarding possible interpretations in that the former admits only a cross reading, when locally bound in contrast to Japanese counterpart.⁷⁾ The present observation also diverges from Chung and Park (1998), who claims that *selo* can in principle have cross and parallel reading when it is long distance bound as well as

to the same specific individual or object, the anaphoric relation between the two will be called coreference. (ii) Otherwise, the anaphoric relation between the two will be called bound variable anaphora (Hoji 1997b, p. 2).

5) I will use the definition of c-command in terms of the first branching node by Reinhart (1976, p. 32) as given below, although nothing in the present discussion of the bound variable reading crucially hinges on the particular definition of c-command:

Node A c(constituent)-commands node B if neither A nor B dominates the other and the first branching node which dominates A dominates B.

6) The intuition regarding (10), however, is not that straightforward as noted by a reviewer who claims that it is hard to get a coreference reading.

7) According to Hoji (1997b, p. 34), *otagai* can have a parallel reading when locally bound as below.

[John to Bill]-ga hissininate [pro otagai]-o urikonde ita (koto)
 John and Bill-NOM very:hard -ACC was promoting fact

locally bound, but with no coreference reading. With respect to their intuition regarding coreference reading of *selo*, the example above in ((4)=(10)), however, clearly shows that *selo* can also have the coreference reading when it is not locally bound. This can be confirmed by the fact that one can add *kongtong* 'joint' and can still have a coherent reading of *selo* when it is not locally bound, as shown below in (13-14).

- (13) a. [John-kwa Bill]_i-i [selo_i-uy kongtong
 John and Bill-NOM each other-POSS joint
 yeonkwu nonmwun]-lul palpyohayssta.
 research paper-ACC presented
 'John and Bill presented their paper.'
- b. [Twu nala]_i-ka [selo_i-uy kongtong kyengpi
 two country each other-POSS joint surveillance
 kwuyeok]-ulopwuthe cheolswuhayssta.
 area-from withdrew
 'The two countries_i withdrew from their_i joint surveillance area.'
- (14) John_i-i Bill_j-ekey [LI-ka selo_i-uy kongtong
 John-NOM Bill-DAT LI-NOM each other-POSS joint
 yeonkwu nonmwun-ul kechaciankilohaysta-ko] malhayssta.
 research paper-ACC rejected-COMP said
 'John_i told Bill_j that LI rejected their_{i+j} joint paper.'

Below, I will argue that the asymmetric readings manifest in local and nonlocal binding of *selo* follow from binding theory, given the proposal for *selo* having a complex structure of [*pro selo*], which I will crucially assume is a pronominal in terms of binding theory. It will be shown that the asymmetric readings of *selo* in these two domains will be neatly accounted for in strictly binding theoretic terms with the complex structural representation of *selo*, together with the corresponding more fine-grained indexing notation of the binding theory, hence avoiding somewhat arbitrary interpretive procedure of the reciprocal as in Hoji (1997a, b, 2003). It should be noted that he fails to specify what type of expressions [*pro otagai*] belongs to in terms of binding theory, hence it is not entirely clear how cross reading, parallel reading and coreference reading of [*pro otagai*] obtain in his system.⁸⁾

8) The same point also applies to Chung and Park (1998), which also fails to specify the status

Now let us consider cross reading of locally bound *selo* as in (2) first, which is repeated below as (15).

- (15) [John-kwa Mary]_i-ka selo_i-lul coahanta.
 [John and Mary]-NOM each other-ACC like
 ‘[John and Mary]_i like each other_i.’

I will assume the indexing mechanism of the reciprocal by Heim, Lasnik and May (1991). According to them, the structure of reciprocal *each other* in English as in (16) is rather complex, consisting of the distributor *each* and the reciprocator *other* with the former undergoing LF movement, based on the proposal by Bennett (1974),⁹⁾

- (16) [John and Mary]_i love each other_i.

They thus suggest that syntactically the example in (16) has the following structural representation and indexing at LF in (17), which accounts for the bound variable reading of so called cross reading of ‘each loving the other,’ which is in fact the only reading available in (16):

- (17) [[John and Mary]_i each₂]₂ love [e₂ other]₃

Intuitively, the structural representation in (17) is intended to express any two distinct individuals of *John* and *Mary* are such that the first loves the second. Abstracting away from the detailed discussion of the semantics of the reciprocal by Heim, Lasnik and May (1991). I will suggest that the example above in (15) will also be analyzed in the same way by giving the following structural representation in (18) for the cross reading with D roughly corresponding to distributor *each* in English, and *selo* [e

of *selo* in terms of binding theory. They suggest that *selo* has [_{NP} [_{NP} *pro selo*] P] with P construed as either referring to self or the other, which amounts to say that *selo* can be either an anaphor or a pronominal, or possibly an R-expression in terms of binding theory.

9) The interpretation of the reciprocal *each other* by Bennett (1974) as cited in Heim, Lasnik and May (1991, p. 68) is as below.

each other_iξ_i ⇒ λx ∨ x_i (x_i · Π x) ∨ x_j (x_j · Π x ∧ x_i ≠ x_j)ξ_i(x_i)

Each other is an operator introducing a universal quantification over two variables x_i and x_j . It further specifies that each of the two variables is restricted to atomic parts of the value of x , requiring that only assignments giving different values for x_i and x_j are allowed.

other], given the present assumption that [*pro selo*] is a pronominal:¹⁰⁾¹¹⁾

(18) [_S [_{NP_i} D_k]_k V [_{pro_k} [_{selo}]]_i]

As one can notice, the only difference between the English representation in (17) and the Korean one in (18) is that the latter has *pro* instead of the trace of *each* in the former. The representation in (18) essentially accounts for the cross reading of (16).¹²⁾ Throughout I will use head initial notation for LF representations for convenience sake.

Now the question is why then coreference and parallel reading of *selo* do not obtain in (2). Given the present assumption that *selo* has the complex structure of [*pro selo*] and that [*pro selo*] is a pronominal, the NP [*pro selo*] should not be coindexed with the antecedent in its local domain of S, otherwise Binding Condition B will be violated. Thus the coreference reading in (19a) and parallel reading in (19b), both of which require coindexing of the pronominal [*pro selo*] with the relevant antecedent in a local domain of S as illustrated below are out of the question.

(19) a. [_S NP_i V [_{pro_i} [_{selo}]]_i]
 b. [_S [_{NP_i} D_k]_k V [_{pro_k} [_{selo}]]_k]

Next, let us turn to the cross, parallel and coreference readings manifest in nonlocal domain as in (10) repeated below as (20). Given that [*pro selo*] is a pronominal, the example in (20) can have the following representations in (21):

10) One may suggest that the first occurrence of *selo* in the example below is the overt realization of the distributor corresponding to *each* in English.

Kutuli selo-ka selo-lul coahanta
 [they each]-NOM the other-ACC like
 'They each like the other.'

11) A reviewer wonders whether the indexing in (18) is an instance of *i*-within-*i* violation. For this matter one may remove the out most index *k*, on which nothing crucially depends in the present analysis.

12) A reviewer notes that given the indexing of [*e other*] and [*pro selo*] in (17) and (18) both should be viewed as a pronominal, which however is not necessarily the case. It should be noted that nothing prohibits the indexing of [*e other*] in (17) from being an instance of an R-expression in terms of binding theory.

- (20) [John-kwa Bill]_i-i [CP Mary-ka selo_i-lul coahanta-ko]
 [John and Bill]-NOM Mary-NOM each other-ACC like-COMP
 sayngkakhanta.

think

'John thinks Mary likes Bill, and Bill thinks Mary likes John.'

'John_i thinks Mary likes him_i and Bill_j thinks Mary likes him_j.'

'[John and Bill]_j think that Mary likes them_i.'

- (21) a. [NP_i D_k]_k V [CP NP V [pro_k [selo]_j]]
 b. NP_i V [CP NP V [pro_i [selo]_i]]
 c. [NP_i D_k]_k V [CP NP V [pro_k [selo]_k]]

As one can see, the structure in (21a) is responsible for cross reading, where as the one in (21b) accounts for the coreference reading, and the one in (21c) the parallel reading.¹³ None of the above representations violate Binding Condition B, since the pronominal [*pro selo*] is not coindexed with their respective antecedent in a local domain, hence admitting all three readings of *selo* in (20).

Now let us turn to the example in (3), repeated below as (22), which apparently seems to be an argument for *selo* as an anaphor.

- (22) *Selo_i-ka [John-kwa Mary]_j-lul coahanta.
 each other-NOM [John and Mary]-ACC like
 *'Each other_i likes [John and Mary]_j.'

One may wonder why the above example is ungrammatical, given that *selo* is a pronominal that does not require a c-commanding antecedent. We need to account for why it is ungrammatical in the present system. The example does not admit cross, parallel and coreference readings. The question is why none of the readings obtain in (22). Please recall that *selo*

13) In fact, [*pro selo*] as a pronominal is also responsible for the parallel and coreference reading in *selo* when it is not locally bound as in (20) in contrast to *each other* in English as below, which does not admit the readings.

?The men_i demanded that each other_i be arrested.

The example above admits cross reading only. The contrast in the available readings between Korean and English in nonlocal domain will follow by assuming that [*e other*] in English is an R-expression but not a pronominal in terms of binding theory, which is actually what Heim, Lasnik and May (1991, p. 73) suggest.

has the complex structure of [*pro selo*] which is a pronominal, hence co-reference reading and parallel reading as represented below in (23a) and (23b) respectively will lead to Binding Condition C (Chomsky 1981, among others) and Strong Crossover violation (Postal 1971, Wasow 1972, Lasnik 1976), respectively.¹⁴⁾

- (23) a. [[*pro*_i [*selo*]]_i-ka [John-kwa Mary]_i-lul coahanta.
 b. [[*pro*_k [*selo*]]_k-ka [John-kwa Mary]_i D_k_k-lul coahanta.

Why then does cross reading not obtain either in (22)? The relevant LF representation will be the following in (24) in the present system:

- (24) [[*pro*_k [*selo*]]_k-ka [John-kwa Mary]_i D_k_k-lul coahanta.

As one can see, the above representation is a typical instance of Weak Crossover violation (Postal 1971, Wasow 1972, Chomsky 1976, Higginbotham 1980, Koopman and Sportiche 1982, Reinhart 1983, and Safir 1984, among others), hence ungrammatical. As it turns out, the ungrammaticality of the example in (22) has nothing to do with the status of *selo* as an anaphor, which needs a c-commanding antecedent. The present argument ruling out the ungrammaticality of the example in (22) as a violation of independent constraints of the grammar such as Binding Condition C, Strong crossover and Weak Crossover can be further supported by the following example in (25), which is more or less acceptable, as originally observed by Chung and Park (1998, p. 428):¹⁵⁾

- (25) †[*Selo*_r-uy coach]_j-ka [John-kwa Mary]_i-lul chingchanhayssta.
 each other-POSS coach-NOM [John and Mary]-ACC praised
 'Their_i coach praised [John and Bill]_i.'

The question is why it is that (25) is grammatical. The present proposal

14) A reviewer wonders whether a distributor can serve as a variable too. In fact what serves as a variable is the *pro* within [*pro selo*] in the present analysis.

15) The example in (25) in my intuition is slightly deviant. Please note that one can relatively easily have the coreference reading in the following example:

‡[*selo*_r-uy chinkwu]_j-ka [John-kwa Bill]_i-ul paysinhayssta.
 each other-POSS friend-NOM [John and Bill]-ACC betrayed
 'Their_i friend betrayed [John and Bill]_i.'

for the structure of *selo* as [*pro selo*] and its status as pronominal in fact predicts that the example above in (25) is acceptable, only if *selo* is construed as having a coreference reading.¹⁶⁾ Indeed, the prediction is born out. Let us see why. The example above in (25) will have the following representation for the coreference reading in the present system:

- (26) [[[pro_i [selo]_j]-uy coach]_j-ka [John-kwa Mary]_j-lul
 each other-POSS coach-NOM [John and Mary]_j-ACC
 chingchanhayssta.
 praised
 'Their_i coach praised [John and Bill]_j.'

Given that coreference does not require c-command between the related expressions, nothing blocks the reading in (25). Next let us turn to cross and parallel readings in (25). The respective representation will be the following in (27) again in the current system:

- (27) a. [[[pro_k [selo]_j]-uy coach]-ka [John-kwa Mary]_j D_k]-lul
 each other-POSS coach-NOM [John and Mary]_j-ACC
 chingchanhayssta.
 praised
 b. [[[pro_k [selo]_k]-uy coach]-ka [John-kwa Mary]_j D_k]-lul
 each other-POSS coach-NOM [John and Mary]_j-ACC
 chingchanhayssta.
 praised.

As one can see, neither of the two readings in (27ab) obtains, given that they all lead to Weak Crossover. Now interestingly when the example in (22) is embedded as in (28), the three readings all obtain. This is also predicted under the present analysis.

16) Chung and Park (1998) observes that the example in (25) has cross and parallel reading, diverging from the present intuition. Hoji (1997a, b) reports that the Japanese example with *otagai* in the same configuration as the one in (25) admits only a coreference reading.

- (28) [John-kwa Bill]_i-un [selo_i-ka Mary-lul coahanta-ko]
 [John and Bill]-TOP each other-NOM Mary-ACC like-COMP
 sayngkakhanta.
 think
 'John thinks that Bill likes Mary and Bill thinks that John likes
 Mary.'
 'John_i thinks that he_i likes Mary and Bill_j thinks that he_j likes
 Mary.'
 '[John and Bill]_j think they_i like Mary.'

The representation below in (29a) is for cross reading and the ones in (29b) and (29c) are for parallel reading and coreference reading, respectively. As one can see, none of the representations for cross, parallel, and coreference readings in (29) violate Binding Condition B, given that [*pro selo*] as a pronominal is not locally bound by the antecedent.

- (29) a. [NP_i D_k]_k V [CP[pro_k [selo]]_j V NP]
 b. [NP_i D_k]_k V [CP[pro_k [selo]]_k V NP]
 c. NP_i V [CP[pro_i [selo]]_i V NP]

Hence, as it turns out, to the extent that one claims that *selo* is an anaphor and hence requires a c-commanding antecedent, based on the example as in (22), the claim is crucially flawed: The ungrammaticality of (22) actually follows from independent principles of the grammar, rather than the particular property of *selo* as an anaphor, which requires a c-commanding antecedent.

3. Conclusion

As shown thus far, *selo* is not a local anaphor (Yang 1984 for Korean, also see Kitagawa 1986, Saito 1992, Miyagawa 1997, for Japanese counterpart *otagai*). It is not a long distance anaphor either (Harbert 1995, Napoli 1993). It has the complex structure of [*pro selo*], which is pronominal in terms of binding theory. The complex structure of [*pro selo*], which is a pronominal, is responsible for split antecedence, long distance dependence and the lack of requirement for c-commanding antecedent. From the complex structure [*pro selo*] as a pronominal, which in turn is subject to Binding Condition

B, follows our noble observation of the asymmetry in the readings of *selo* manifest in local and nonlocal domain.

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