Backward Anaphora[*]

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Lee, Hyeran. 2002. Backward Anaphora. *The Linguistic Association of Korea Journal, 10*(4), 117-147. This paper aims to account for the backward anaphora that seems to be against the c-command requirements in the anaphor-antecedent relations. It had been claimed that the binding conditions should apply at LF or at D-structure for the backward binding cases involving psych-verbs and causatives. Under the recent development of minimalism where the concept of levels disappears to adopt a cyclic derivation, the data that show the backward binding phenomena have not been discussed in the area of the binding theory. In this paper, I argue that the backward binding cases can be incorporated into the core binding phenomena with the general assumptions on the thematic prominency. It is discussed how the dependency between NPs involving backward anaphora is determined by the thematic prominency. The Agree operation takes place between the Probe T and the Goal with the uninterpretable [-R] and [prominent] feature, by which an anaphor is valued, producing a proper interpretation.

Key words: binding, binding theory, anaphor, backward anaphor, phi-features, prominent, prominency

1. Introduction

The binding theory has been discussed as a dependency relation between NPs. It attempted to clarify how an anaphor is related with its antecedent. The different binding conditions were proposed by Chomsky (1981) to explain the different phenomena of the binding facts. This has been developed into the LF-movement theory that accounts for both the

long-distance anaphors and locally bound anaphors in a unified way (Chomsky, 1986; Battistella, 1989; Cole, Hermon, and Sung, 1990; Pica, 1991; Cole and Wang, 1996). Along the same line, a covert anaphor movement was changed into a feature movement with minimalism (Chomsky, 1992; Yang, 1994, 1996; Lee, 1997; Kim, 1999), since moving features costs less than moving categories. Another proposal was made by Reinhart and Reuland (1993) based on the semantic properties of predicates. Their work is meaningful in that not only NPs but also predicates come into play in the binding phenomena. A derivational approach under the minimalism was made by Hornstein (2001), Grohmann (2000), and Kim (2001).

These approaches could not provide an explanation for the residue of the anaphoric phenomena, i.e. backward anaphora, but only partially account for core constructions. In this paper, I will focus on the backward anaphors that have been a problem in the area of the binding theory. To deal with such cases, I claim that the dependency relation between NPs is determined by the thematic prominency.

2. Previous Studies

The c-command requirements in the binding relations are essential to form the binding theory. In Chomsky (1981), all the binding conditions were defined by the word "bound" and the word "bound" was defined by the notion of c-command. It has thus been claimed that the NPs that are not bound within the local domain or do not satisfy the c-command requirements are not anaphors but something else. McCawley (1972) and Katada (1991) argue that they are reflexive pronouns. Clement (1975), Maling (1984), Sells (1987) and Reinhart and Reuland (1989, 1993) argue that they are emphatic pronouns or logophors which make reference to the individual whose speech, thought, or feelings are reported to other individuals. According to this line of research, the relaxation of the strict c-command and locality might be due to the fact that no syntactic binding is involved. With evidence from Brazilian Portuguese, Cançado (1999), however, argues that

backward anaphora cannot be licensed by logophoricity, since there are examples that do not implicate the subject's (un)consciousness.

If they are not anaphors, it should be accounted for why there is a referential dependency at all. If they are actually pronouns, the question is why they have a reflexive form different from a pronoun. Is the structural and formal explanation not possible at all for such anaphors? It is undeniable that there are anaphors that should be accounted for by the rules of discourse. However, it is also required to find a unified syntactic rule, because there is an obvious syntactic dependency between the anaphor and the antecedent from large amounts of core data. Furthermore, if we could find a syntactic account for non-core anaphors, which do not seem to belong to the syntactic binding, a better generalization on the binding facts could be obtained.

Anaphors contained in psych-verb and causative constructions are in an arguable boundary between logophors and anaphors. Belletti and Rizzi (1988), instead of putting them aside as involving logophors, claimed that the principle A applies at D-structure for those constructions.

(1) Questi pettegolessi su dei se$_i$ preoccupano Gianni$_i$
     piudi ogni altra cosa.
     'These gossips about himself$_i$ worry Gianni$_i$ more than anything else (Belletti and Rizzi, 1988)'

(2) [[preoccupano [Gianni$_i$][Questi pettegolessi su dei se$_i$]] piudi ogni altra cosa]

Belletti and Rizzi said that both the subject and object are in the VP complement position at D-structure as in (2). It was claimed that the Experiencer is in the higher position than the Theme at D-structure, and thus it can properly bind the Theme subject, satisfying the c-command requirements. With the elimination of D-structure in minimalism, their analysis should be reanalyzed, which will be our concern in this paper.

Other linguists such as Giorgi (1991), Reinhart and Reuland (1993), Reuland and Koster (1991), Hellan (1991), Everaert (1991), Katalin (1991), and Pollard and Sag (1992) argued that the binding theory should make crucial reference to the thematic structure in an effort to explain the different binding phenomena across languages.

Grimshaw (1990) proposed a two-tiered system of prominence in which the relative prominence of an argument is determined in both the thematic and the aspectual dimension. The psych-verb constructions were claimed to involve a mismatch in those dimensions. According to her, the backward anaphora is permitted by the aspectual hierarchy or by the thematic hierarchy depending on the psych-verb classes such as the *fear* class and the *frighten* class.

Arguing against Belletti and Rizzi (1988) and Grimshaw (1990), and following Stowell (1986), Park (1991) claimed that Experiencers raise at LF to the Spec of IP where they c-command the Theme subject. He argued that Experiencer raising at LF can be evidenced by the syntactic A-movement of Dative Experiencers in the stative psych-verbs. He provides the following examples.[1]

(3) a. Mira$_i$-ekey casin$_i$-i twulyewo-ess-ta
        Mira-DAT self-NOM afraid-PAST-DEC
        'Mira was afraid of herself'
   b. casin$_i$-i Mira$_i$-ekey twulyewo-ess-ta
   c. *casin$_i$-ekey Mira$_i$-ka twulyewo-ess-ta
   d. *Mira$_i$-ka casin$_i$-ekey twulyewo-ess-ta

Adopting Mahajan's (1990) proposal that clause-internal scrambling can be an instance of A-movement, Park (1991) argued that the overt syntactic movement as shown in (3) can be an indirect evidence

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1) Park (1990) provides data, using *casin*. In this paper, I discuss the backward binding facts, using *caki*. Both *casin* and *caki* are reflexives in Korean, showing the long-distance binding and backward binding phenomena. Though there are differences in the blocking effects, these differences will be put aside in discussing the backward binding cases.

advocating the LF raising of Experiencers. He proposed the thematic hierarchy at LF that motivates Experiencers to raise to the higher position than a Theme NP.

(4) (Agent (Experiencer (Goal/ Source/ Location (Theme))))

The previous analyses that argue for the need of a thematic hierarchy are not against Chomsky (2001). He proposes to adopt a pure configurational theta-theory, eliminating s-selectional features or theta-grids distinct from the semantic properties of head. According to him, the C-I system requires that SEM[2] express a variety of semantic properties, which include at least an argument structure (Chomsky, 2001, p. 7). He also said that theta-theoretic properties depend in part on configuration and the semantic properties SEM(H) of the head (label) (Chomsky, 2001, p. 8).　By H. B. Lee's (2001) interpretation, a theta-role is determined by the structure, so that s-selectional features or theta-grids are dispensable.　I will adopt the configurational theta theory from Chomsky (2001) to analyze the backward anaphora. What follows are the detailed proposals for this paper.

3. Assumptions and Proposals

3.1. Why Anaphors in Syntax

There have been many puzzling points, when anaphors were analyzed by the syntactic principles. Parameterization of the binding domain had been a persistent problem in term of UG. Additional assumptions and stipulations, which are not desirable in UG, were made to include exceptional cases under the given theory. Different movement mechanisms were used to provide an escape hatch for the analysis of

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2) The language L generates a set of derivations. The last line of each derivation is a pair <PHON, SEM>, where PHON is accessed by the sensorimotor (SM) system and SEM by the conceptual-intentional(C-I) system (Chomsky, 2001, p. 3).

anaphors. Even worse, the logophoric effects could never be accounted for, leaving a large amount of data unexplainable. Despite all these unresolved problems, the dependency relation of anaphors should be accounted for by the syntactic rules. The reasons are as follows.

First, there is an obvious locality between the anaphor and the antecedent in spite of many exceptional cases. Given that the locality is the biggest issue in syntax, we might think that the observed locality in anaphors should also fall in the area of syntax. Second, as noted by Grohmann (2000) and Hornstein (2001), the identity between the two elements has long been explained syntactically, not solely semantically since Lees and Klima (1963). Third, under the minimalism, all the syntactic phenomena are accounted for by Merge and Agree with some constraints on locality. If this is the case, we might inductively think that the same universal operations would be involved in the relation between the anaphor and the antecedent.

If such an analysis within minimalism works out, immense benefits would be obtained. First, the arguable concept of binding domains will disappear. Second, Condition A will be dispensed with. Third, the indices will be dispensed with, satisfying the inclusiveness condition[3] in minimalism. Forth, the binding theory will reduce to Merge and Agree, which are desirable in terms of UG. My analysis of anaphors will thus be an experimental test on the Goal of UG.

3.2. Assumptions and Core-Binding Cases

Within the framework of Chomsky (1998, 2001), I assume that anaphors have an uninterpretable [-R][4] feature. A question is why

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3) A perfect language should meet the condition of inclusiveness; any structure formed by the computation is constituted of elements already present in the lexical items selected for N; no new objects are added in the course of computation apart from rearrangements of lexical properties (in particular, no indices, bar levels in the sense of X-bar theory) (Chomsky, 1995, p. 228).

4) The [-R] represents an anaphoric feature that is uninterpretable. In my earlier works, Lee (1997, 2001a, 2001b), the [a] is used to represent the anaphoric feature. In this paper, the [-R] is used, since the [+/-R] used by many authors

anaphors have the [-R] feature? When anaphors are introduced into the numeration, they are different from other referential NPs. Normal NPs are referential with their meaning directly connected with the world, while anaphors lack such referentiality. Anaphors are dependent on another NP within a sentence, which should be noticed by the computation to get interpretation. As a mechanism for the computation to notice the fact, I posit the anaphoric feature and name it [-R]. The [-R] is motivated by the following data in binding.

(5) a. Chulsu$_i$-ka   caki$_i$-lul   silheha-n-ta
       Chulsu-NOM caki-ACC hate-PRES-DEC
       'Chulsu hates himself'

   b. Sunhee$_i$-ka   caki$_i$-lul   silheha-n-ta
       Sunhee-NOM   self-ACC   hate-PRES-DEC
       'Sunhee hates herself'

   c. *Nay$_i$-ka caki$_i$-lul   silheha-n-ta
        I-NOM self-ACC hate-PRES-DEC
        'I hates self'

   d. John$_i$ hates himself$_i$

   e. *Mary$_i$ hates himself$_i$

In the above data, *caki* (the 3rd person) is null in references. *Caki* cannot be interpreted unless it is filled with references by a syntactic process. Traditionally an interpretation was obtained by linking or indexing under the binding principles. Within our analysis, *caki* recovers its references by the phi-feature checking between the Probe T and the Goal *caki*. By the Agree operation, the phi-features are checked, and when the phi-features match, *caki* recovers its reference from the referential NP ((a) and (b)); when the phi-features do not match, it cannot recover its reference, leading the sentence to crash (c). The same applies to *himself* (d and e).

Under the minimalism, derivations are converged by eliminating the

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seems to be more familiar to readers to indicate the referentiality.

uninterpretable features: Case is assigned by eliminating the uninterpretable Case feature, and movement (internal Merge) is made by eliminating the EPP feature. Chomsky (2001) says that EPP is not actually a feature but a property that requires a position for a subject in a certain language. If this is so, we might be able to say that the [-R] is an uninterpretable feature or a property that uniquely belongs to anaphors. Interpretation of anaphors is obtained by eliminating the [-R].

This assumption is intuitively natural, since anaphors cannot be interpreted unless they are bound to antecedents due to their lack of references. The issue here is how the binding process takes place. The phi-features of Probe activate the [-R] feature so that the [-R] feature should undergo Agree with the phi-features of Probe. The Agree operation is made between the phi-features of Probe and those of Goal, by which the [-R] is eliminated. It is assumed that the [-R] always carries the phi-features of the anaphor, since the feature match should take place with regard to phi-features.[5]

Another question is why Agree is the right operation for anaphors. The Agree operation is made by the phi-feature match between the Probe and the Goal. The EPP is checked off by the phi-feature match between an NP and T (or v). The overt movement (internal Merge) is involved in this case. The uninterpretable Case feature is eliminated by the phi-feature match between an NP and T (and v). Without an overt movement, the Case feature is checked off by Agree in situ. For all operations, the phi-feature match is essential to have a checking relationship. In the case of anaphors, the phi-feature match plays an important role, first because the [-R] should form a checking relation to be deleted, and second because the [-R] should be valued by another matching phi-set to get interpretation. See the following examples.[6]
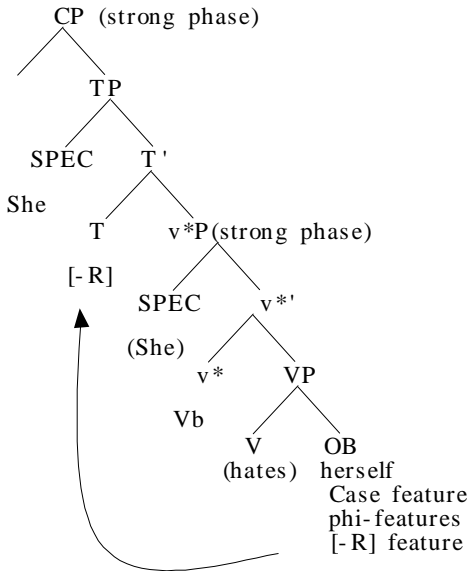
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5) A reviewer suggested that the reflexive morpheme might have the [-R], while the pronoun part has the phi-features in *him+self* and *them+selves*, and thus the [-R] in *-self* raises.

6) A reviewer asked of what is the constraint of [-R] raising and how the [-R] works for long-distance anaphors in Korean. The expanded explanation on English cases is in Lee (2001b). Long-distance binding in English is not permitted, since the [-R] is eliminated after the Agree operation. The [-R] seems

(6) a. She$_i$ hates herself$_i$

   b. [$_{CP}$ [$_{TP}$ She$_i$ T [$_{vP}$ (She) v-hates [$_{vP}$ V-(hates)
     herself$_i$]

   c. (A tree diagram is below.)

(7) a. *She$_i$ hates himself$_i$

   b. [$_{CP}$ [$_{TP}$ She$_i$ T [$_{vP}$ (She) v-hates [$_{vP}$ V-(hates)
     himself$_i$]

(8) a. *She$_i$ hates themselves$_i$

   b. [$_{CP}$ [$_{TP}$ She$_i$ T [$_{vP}$ (She) v-hates [$_{vP}$ V-(hates)
     themselves$_i$]

(9)

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              CP (strong phase)
             /
            TP
           /  \
        SPEC   T'
        She   /  \
             T    v*P (strong phase)
            [-R] /   \
              SPEC    v*'
              (She)  /   \
                    v*    VP
                    Vb   /  \
                        V    OB
                     (hates) herself
                             Case feature
                             phi-features
                             [-R] feature
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In (6) and its tree diagram (9)[7], the T (Probe) locates the [-R],

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to undergo the same Agree operation for long-distance anaphors in Korean with the assumption of "anaphoric Agr (Borer, 1986)", which makes the anaphor binding possible with the subjects across the clause boundary. The long-distance binding will be discussed in my subsequent works, since it is another big issue.

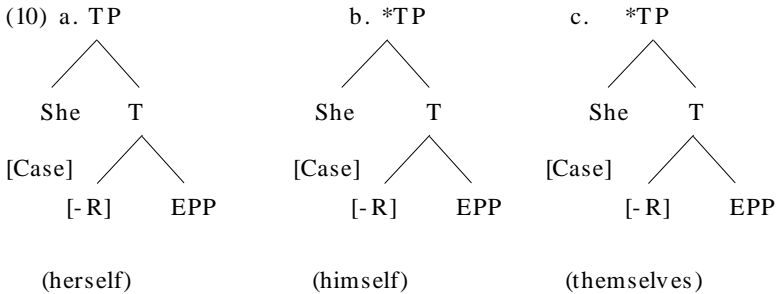7) A reviewer asked how the [-R] can pass through the strong phase v*P.

while the T locates the subject NP to undergo Agree to check EPP, Case, and phi-features. By the phi-feature checking, all other uninterpretable features such as EPP on T, Case on the subject NP, and [-R] raised onto T are eliminated. It is claimed that multiple checking or multiple Agree is possible in minimalism (Chomsky, 1998, 1999). Yang (2001) also argues for multiple Agree such as the primary Agree and secondary Agree. The [-R] feature in *herself* undergoes Agree with phi-features of T, providing a proper interpretation. The sentence (7), however, crashes, since the [-R] in *himself* does not match with phi-features of T in gender. In the same way, the sentence (8) also crashes due to feature mismatch between the Goal and the Probe in number.8)

The detailed structure on T are as below.

To satisfy the PIC (Phase Impenetrability Condition), which says that the domain of H is not accessible to operations outside HP, but only H and its edge (Chomsky, 1999, p. 10), the [-R] should raise through the v head. I assume that the [-R] raising goes through v to reach on T. This type of movement is not desirable, since there is no reason to go to v but satisfying the PIC. Another option could be that the [-R] stays in situ for the Agree operation as in footnote (8).

8) If we adopt the Agree operation under the minimalism, movement is not needed. In this paper, I assumed that the [-R] is raised to T and then undergoes the Agree operation to recover the references. The Move-Agree operation seems to be less desirable than the Agree only operation. Another option without movement could be that the [-R] undergoes Agree with v in situ, and the copy of the subject *she* in [Spec, v] plays a role to valuate the [-R]. In this paper, I take the Move-Agree operation in spite of its weakness in order to make T as a Probe. A reviewer asked why the [-R] moves to T, not to something else. In discussing the backward anaphors in the following sections, T plays a role for the prominency checking. By moving the [-R] to T, we can make the Agree operation to take place on T in both the core binding cases and the backward binding cases.

(10) a. TP   b. *TP   c. *TP

  She T   She T   She T

[Case]   [Case]   [Case]

  [-R] EPP   [-R] EPP   [-R] EPP

  (herself)   (himself)   (themselves)

We assume that the [-R] always carries the phi-features. This is possible since the phi-features of any NPs are interpretable and thus available repeatedly. (b) and (c) crash due to the phi-feature mismatch between the Probe T and the Goal [-R]. (a) converges due to the feature match between the Probe and the Goal. A question can be asked how the [-R] obtains its reference by eliminating the [-R] by Agree. (b) and (c) are nicely excluded due to the feature mismatch. The problem arises when we have the feature match. When the features match, the [-R] is assigned references by T that shares all the features and properties with the subject NP. As soon as the [-R] obtains references, it is eliminated, leading the sentence to converge. The same is true of Case: Case is assigned while the Case feature is checked and eliminated by the phi-feature match. With the assumption discussed in this section in mind, let us see the backward anaphor in Italian under the minimalist's viewpoint.

4. Psych-verb Constructions by Agree

4.1. Thematic Prominency After Transfer[9]

The backward anaphors are found in psych-verb constructions across

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9) According to Chomsky (2001), the narrow syntax (NS) maps LA (Lexical Array) to a derivation D_{NS}. TRANSFER hands D_{NS} over to the phonological component   and the semantic component   .

languages. The following example is repeated from (1).

(11) Questi pettegolessi su dei se$_i$ preoccupano Gianni$_i$ piudi ogni altra
cosa.
'These gossips about himself$_i$ worry Gianni$_i$ more than anything
else (Belletti and Rizzi, 1988)'

The sentence (11) is an example that the binding condition applies at
D-structure. With the elimination of D-structure and S-structure within
minimalism, the above construction can be reanalyzed by the Agree
operation.

Following Chomsky's configurational theta-theory, it is assumed that
the thematic hierarchy is preserved after TRANSFER. Following Stowell
(1986) and Park (1991), it is proposed that a derivation is formed after
TRANSFER by the relative prominence of an argument. Following
Park (1991) and Grimshaw (1990), the prominency of an argument is
determined by the thematic hierarchy as expressed in (Agent
(Experiencer (Goal/ Source/ Location (Theme)))). Based on this
proposal, (11) should form a derivation like (12) where the thematic
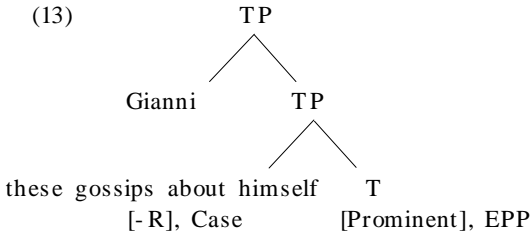hierarchy is observed.

(12) [$_{CP}$ [$_{TP}$ Gianni [$_{T'}$ Questi pettegolessi su dei se T [$_{vP}$ preoccupano
piudi ogni altra cosa]]]].

Gianni, as an Experiencer, is thematically higher than the Theme
subject and thus activated by the [Prominent] on T and located at the
outer Spec of T.[10] The outer Spec of T is available for the
Experiencer, since the multiple Specs are possible in minimalism.

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10) A question can be raised why such a covert movement is necessary, if
Merge and Agree are the major operations in minimalism. Most of syntactic
operations can be explained in the narrow syntax with Merge and Agree. There
seem to be other operations related with interpretation, for example, the scope
effects and binding. In these cases, the covert movement is needed after
TRANSFER to obtain the proper interpretation.

Though an NP can move to a place technically, there should be a motivation why this is so. I propose that prominency checking should take place at the LF interface for Full Interpretation. The feature [prominent] on T is usually checked by an external argument. In the case of psych-verb constructions, however, the Experiencer is fronted at LF to check the feature [prominent] on T. It is natural, since the Experiencer is thematically higher than the Theme.   In (7), the Experiencer, *Gianni,* undergoes Agree to check off the [prominent] feature on T, and at the same time, the [-R] feature undergoes Agree on T by the phi-feature match. The detailed structure is drawn as below.

(13)   TP
                       / \
                  Gianni   TP
                          /   \
   these gossips about himself   T
           [-R], Case   [Prominent], EPP

As a Probe, T locates the [-R], while the T locates the subject NP to undergo Agree to check EPP, Case, and phi-features. By the phi-feature match, all other uninterpretable features such as EPP on T, Case on the subject NP, and the [-R] are eliminated. The feature [prominent] undergoes Agree with the Experiencer *Gianni*. Thus the anaphor recovers its interpretation.[11]

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11) A reviewer noted that this structure causes a problem, since the explanation will end up with the assumption that phi-features of *Gianni*, Subject, and T match all together to provide an interpretation for the anaphor. It is natural that Subject and T match in phi-features as in the usual Agree operation. *Gianni* and T, however, cannot match in phi-features since *Gianni* is 3rd person, male and singular, while T shares 3rd person and plural features with Subject. The T-adjoined position has different property from the T-Spec position, so that anything in the T-adjoined position does not obligatorily match with T in phi-features. With regard to the proposed [prominent] feature, I assume that checking is possible between the [prominent] in T and the

4.2. Justification and Generalization of the Feature [Prominent]

A question arises of (i) why the feature [prominent] on T is necessary and (ii) if it can be generalized to all types of constructions across languages, once its existence is justified. As an answer for (i), the prominent feature is necessary to account for not only the psych-verb and causative constructions but also focused constructions. Free scrambling does not bring the focusing effects, but in many languages fronting of a phrase carries special semantic properties with the focusing effects. Such an overt movement is induced by the [prominent] feature checking in our term or the [+Focus] feature checking. Chomsky (2001) claims that the semantic effects at SEM are formed by external merge at the base structure and internal merge (displacement) before TRANSFER and after TRANSFER. A focused construction is involved with an overt displacement before TRANSFER, showing the semantic effects at SEM. The scopal properties are obtained by a covert displacement after TRANSFER. In addition, I would like to point out that the [prominent] feature checking proposed in this paper is also involved with a covert displacement after TRANSFER. I provide this explanation to show that the prominency checking is necessary not only in the binding area but in the other areas too, and it should be done during derivation, since it has semantic effects.

As an answer for (ii), the prominent feature checking actually takes place in all types of sentences. The prominency is usually checked by the external argument, that is, subject, since the subject is generally the most prominent NP. The prominency checking will be done early in a derivation while the EPP and Case are checked and eliminated.[12] See

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[prominent] in *Gianni*. I agree with the reviewer that more solid motivation for the feature [prominent] and its checking mechanism should be studied.

12) A reviewer asked if the prominency checking can be generalized to the following Korean sentence.

[Tom$_i$-i   [caki$_{i/*j}$-ka   John$_j$-ul   ikyess-ta-ko]   mit-nun-ta]

Tom-NOM   self-NOM John-ACC won-DEC-COMP believe-PRES-DEC

the following.

(14) Tom ate an apple
(15) [$_{CP}$ [$_{TP}$ Tom - *Case, Phi-features, Prominent*
        T - *EPP, Phi-features, Prominent* [$_{vP}$ ate an Apple]

In the above sentences, the external arguments are the most prominent NPs and thus the [prominent] on T is checked off while the EPP and Case are checked and eliminated before TRANSFER.

The problems are raised when the external argument is not the most prominent NP as in psych-verbs, causatives and focused constructions.[13] In this case, the [prominent] feature on T cannot be checked off while the EPP and Case are checked off. The remaining [prominent] feature on T covertly locates the NP that is higher on the thematic hierarchy and it is then checked off after TRANSFER.[14]

'Tom believes that self (he) won John'
Arguments of the predicate *ikyta* ('win') are *caki* and *John*. The Agent *caki* is thematically higher than the Theme *John*, but *caki* cannot check the prominency, since it is not referential and thus has no prominency. This will be evidenced by the ungrammaticality of the simple sentence (*$caki_i$-ka $John_i$-ul ikyess-ta). *Tom* is an argument of the predicate *mitta* ('believe'). *Tom* is an absolutely prominent NP, because it is an argument of the higher predicate. The anaphor *caki* can check against the most prominent NP *Tom* with regard to the prominency and the [-R], providing a proper interpretation.

13) A reviewer asked why the prominency checking is not made with the Theme subject in (11), but waits until after TRANSFER to check with the Experiencer. According to Grimshaw (1990), subjects are the most prominent argument aspectually and thematically in most constructions. In the stative psych-verb constructions, however, there is a mismatch in the aspectual tier and the thematic tier: the Theme subject is the most prominent in the aspectual tier, while the Experiencer is the most prominent in the thematic tier. When the prominency coincide in both tiers, the prominency checking takes place as early as possible before TRANSFER. When there is a mismatch as in the stative psych-verb constructions, the prominency checking should be made after TRANSFER.

14) A reviewer asked how the other NPs can be licensed if T licenses the most prominent NP. I am not sure about the other NPs. Our concern here is the most prominent NP which provides the antecedent for the anaphor. Prominency has been an important concept to determine the relation between the anaphor and the antecedent since GB, as expressed in the concept of accessible SUBJECT

(16) A picture of himselfᵢ pleased Johnᵢ

(17) [CP [TP John-*prominent* [TP a picture of himself-*Case,*
　　　phi-features T-*EPP, Phi-features, Prominent* [vP pleased (John)]

　　When the external argument is not the most prominent, the EPP and Case are checked off by the external argument, subject, before TRANSFER. The remaining [prominent] feature on T will be eliminated by a covert movement of the most prominent NP after TRANSFER as in (17) above.

4.3. Psych-verb Constructions in English

　　The psych-verb constructions in English are illustrated as below.

(18) Each otherᵢ's pictures frighten the girlsᵢ

(19) [CP [TP the girls [T' each other's pictures T [vP frighten (the
　　　girls)]

(20) A picture of himselfᵢ annoyed the politicianᵢ.

(21) [CP [TP the politician [T' a picture of himself T [vP annoyed (the
　　　politician)]

　　After TRANSFER, the feature [prominent] on T, T being the Probe, activates the Goal. The activated feature [prominent] on the Experiencer undergoes Agree on T, making (19) as a proper derivation for (18). The [-R] feature on the anaphor undergoes Agree on T by the phi-feature match. The [prominent] is eliminated against the [prominent] and the [-R] is eliminated by the phi-feature match. The detailed structure on T is drawn as below.

_____

(Chomsky, 1981).

(22)

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                        TP
                       /  \
             the politician    TP
                              /  \
        a picture of himself        T
              [-R]              [Prominent]
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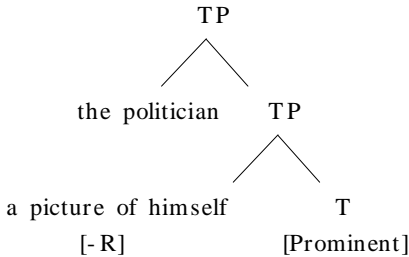
In the above structure, the [prominent] is checked off by the prominent NP *the politician*. The [-R] is eliminated by the phi-feature match between the T head and the subject NP.[15) The same explanation applies to (20) and (21). The Korean examples are presented in the following sections.

5. Causative Constructions by Agree

In Korean, there are no psych-verb constructions in parallel to the English cases, since they are expressed with the causative formative. Below is shown the Korean causative constructions.[16)

(23) caki$_i$-uy kwake-ka John$_i$-ul kwolop-hi-ess-ta
     self-GEN past-NOM John-ACC annoy-CAUS-PAST-ta
     'self$_i$'s past annoyed John$_i$'[17)

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15) A reviewer asked if the [-R] does not move to T in this case. The [-R] does not need to move to T in this construction, since the [-R] can undergo the Agree operation in situ.

16) The discourse *caki* can refer to the discourse topic that is not present within a sentence. The discourse *caki* is beyond our range of research, and thus not our concern here.

17) *Caki* in this sentence could refer to the antecedent *John* and to the discourse topic that is not within the sentence. Binding to the discourse topic is not our concern.

(24) After TRANSFER: [$_{CP}$ [$_{TP}$ John-ul [$_{T'}$ caki-uy kwake-ka T [$_{vP}$ (John-ul) kwolop-hi-ess-ta]]]]

If we take a look at (24), the prominency checking takes place on T against the Causee *John* by a covert displacement after TRANSFER. The [-R] feature undergoes Agree on T by the phi-feature match, eliminating the uninterpretable feature.

(25) ?*John$_i$-uy kwake-ka caki$_i$-ul kwolop-hi-ess-ta
John-GEN past-NOM self-ACC annoy-CAUS-PAST-ta
'John$_i$'s past annoyed self$_i$'

(26) After TRANSFER: [$_{CP}$ [$_{TP}$ caki-ul [$_{T'}$ John-uy kwake-ka T [$_{vP}$ (caki-lul) kwolop-hi-ess-ta]]

In contrast to (24), (25) and (26) cannot produce a reading where *caki* takes *John* as an antecedent. The LF structure in (26) shows why such a reading is not possible.[18] While *caki* undergoes Agree on T due

_____

18) A question can be raised about the grammatical judgement on this sentence. If we compare all three sentences below, the sentences (ii) and (iii) seem to be at least better than (i).

(i) *?John$_i$-uy kwake-ka caki$_i$-ul kwolop-hi-ess-ta

(ii) caki$_i$-uy kwake-ka John$_i$-ul kwolop-hi-ess-ta

(iii) Tom$_i$-i [John$_j$-uy kwake-ka caki$_{i*j}$-ul kwolop-hi-ess-ta-ko] malha-yss-ta

Our analysis predicts the sentence (i) to be ruled out. Why is this sentence rather acceptable to many speakers against our expectation? This is because *caki* can be bound to the discourse topic freely. If speakers assume that the discourse topic is *John*, *caki* can be bound to *John*; in the same way, if speakers assume that the discourse topic is *Sunhee*, *caki* can be bound to *Sunhee*. Though the sentence (i) is theoretically excluded, there are plenty of possibilities for the sentence to sound good, since *caki* can be bound to the discourse topic in Korean.

If we replace *caki* with *cakicasin* in (i), the sentence becomes much better in acceptability: (iv) John$_i$-uy kwake-ka cakicasin$_i$-ul kwolop-hi-ess-ta. A few Korean native speakers said that (iv) is perfect, while (i) is somewhat odd. (Thanks go to Dr. Seung-Ju Yeo and a few others.)

to the [prominent] feature checking, *caki'*s [-R] feature cannot be checked off, since there is no thematically prominent referential NP than *caki* itself. If we embedded the above sentence into the main clause, *caki* can now delete its [-R] by Agree with the thematically higher NP *Tom* as below.

(27) Tom$_i$-i [John$_j$-uy kwake-ka caki$_{i/*j}$-ul
     Tom-NOM John-GEN past-NOM self-ACC
     kwolop-hi-ess-ta-ko] malha-yss-ta
     annoy-CAUS-PAST-ta-COMP say-PAST-DEC
     'Tom$_i$ said that John$_j$'s past annoyed self$_{i/*j}$'

(28) After TRANSFER: [$_{CP}$ [$_{TP}$ Tom$_i$-i [$_{CP}$ [$_{TP}$ caki$_{i/*j}$-ul [$_{T'}$ John$_j$-uy
     kwake-ka T [$_{vP}$ (caki-lul) kwolop-hi-ess-ta-ko]]]] T
     malha-yss-ta]]

5.1. Causative Constructions More Embedded

If we embed (23) into the main clause, the antecedent changes from the Experiencer to the main clause subject, since the main clause subject NP is the most prominent referential NP in the sentence. See below.

(29) Tom$_i$-i [caki$_{i/j}$-uy kwake-ka John$_j$-ul
     Tom-NOM self-GEN past-NOM John-ACC
     kwolop-hi-ess-ta-ko] malha-yss-ta
     annoy-CAUS-PAST-DEC-COMP say-PAST-DEC
     'Tom$_i$ said that self$_{i/j}$'s past annoyed John$_j$'

(30) After TRANSFER: [$_{CP}$ [$_{TP}$ Tom$_i$-i [$_{CP}$ [$_{TP}$ John$_j$-ul [$_{T'}$ caki$_{i/j}$-uy
     kwake-ka T [$_{vP}$ (John-ul) kwolop-hi-ess-ta]]]] T malha-yss-ta]]

The sentence (29) may provide both readings[19]; taking both *John* and

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19) A reviewer commented that *Tom* is the only possible antecedent in this sentence. There is an obvious preference on *Tom* over *John* as an antecedent, since *Tom* is the most prominent NP in the complex sentence. In this respect,

Tom as *caki*'s antecedents, which is a characteristic of long-distance binding. However, the most prominent NP *Tom* is preferred over *John* as an antecedent. This is another piece of evidence that anaphor binding is related with the prominency checking.

The English psych-verb constructions can be embedded to the matrix clause as below.

(31) A picture of himself$_i$ annoyed the politician$_i$

(32) John$_i$ said that a picture of himself$_{i/j}$ annoyed the politician$_j$

The anaphor *himself* in (32) is bound forward and backward which seems to be very unusual. But if we posit two possible derivations after TRANSFER as follows, such a binding is explainable.

(33) [$_{CP}$ [$_{TP}$ John$_i$ said [$_{CP}$ that [$_{TP}$ a picture of himself$_{i/j}$ T [$_{vP}$ annoyed the politician$_j$]]]]]

(34) [$_{CP}$ [$_{TP}$ John [$_{vP}$ said [$_{CP}$ that [$_{TP}$ the politician [$_{T'}$ a picture of himself T [$_{vP}$ annoyed (the politician)]]]]]]]

---

this example does not harm our analysis that the prominency is involved in the binding facts. The issue is whether the intermediate antecedent *John* in the embedded sentence plays a role in the prominency checking. If it does, the analysis will be more consistent and unified to include the general constructions of the long-distance binding data. Let us take the speaker's viewpoint out of the sentence, changing the verb to *diagnose*. Then, we have the following sentence.

(i) Tom$_i$-i [caki$_{i/j}$-uy kwake-ka John$_j$-ul kwolop-hi-ess-ta-ko] cintanha-yss-ta
                                                                    diagnose
   'Tom$_i$ (the doctor) diagnosed that self$_{i/j}$'s past annoyed John$_j$'

With the verb *diagnose* the anaphor can refer to *John* easily. Under a special context where the doctor *Tom* and the patient *John* are close friends or relatives, the anaphor could refer to *Tom* too. Therefore, we might say that both readings are possible in this case.

(33) is a possible derivation after TRANSFER, since the [prominent] is checked by the matrix T. (34) seems to be another possible derivation, since the [prominent] is additionally checked within the embedded clause. I propose that these two derivational options are needed for "the diverse semantic properties at SEM" (Chomsky, 2001). Binding with *John* takes place in (33), while binding with *the politician* is made in (34). The matrix T, as a Probe, activates the [-R] on the picture-NP, undergoing the Agree operation in (33). The [prominent] feature does not have to be mentioned for (33), since it was already checked by the matrix subject *John*. The embedded T in (34) activates the [-R] and the [prominent] on the picture-NP to undergo the Agree operation.[20)]

Our assumptions are now summarized as follows.

(35) (i) Anaphors have an [-R] feature

    (ii) The [-R] feature should be eliminated by the Agree

       operation.

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20) Thanks to a reviewer, one can ask a question if the following sentences could be incorporated into the prominency checking.

(i) John wondered [which picture of himself] Bill saw
(ii) John wondered [which picture of himself] Bill took

These sentences were originally used in Chomsky (1992). According to the copy theory (Chomsky, 1995), the copy of the wh-phrase is present as follows.

(iii) John wondered [which picture of himself] Bill saw [which picture of himself]
(iv) John wondered [which picture of himself] Bill took [which picture of himself]

In (iii), *himself* could be bound to both *Bill* (from the copy position) and *John* (from the moved position). From the copy position *Bill* is the most prominent, while from the moved position *John* is the most prominent. Prominency is well checked by the prominent NPs, which provides a good structure for the [-R] checking. In (iv), *himself* can be bound to both NPs as well. From the copy position, binding could provide an idiomatic reading, while it provides a non-idiomatic reading only from the moved position. Binding facts are not against the thematic prominency in these types of sentences.

(iii) The antecedent should have a thematic prominency for the [-R] feature to be eliminated.

(iv) The [-R] cannot co-occur with the [prominent] feature, prohibited at the base generation.[21] [22]

(v) The thematic prominency is structurally noticed after TRANSFER.

These assumptions are not newly introduced into the grammar. (35i) is the assumption that I posited to account for the binding phenomena. (i) is not unnatural, since the anaphor cannot be interpretable due to the lack of references, unless it finds a way to get interpretation. (ii) is more than convincing, since the Agree operation is a general and unique operation within the framework of minimalism. (iii) and (iv) are natural requirements at the base generation, since an NP without references cannot have prominency at SEM. (v) is also natural, since if something is prominent or focused at SEM, it should be noticed at a certain point in derivation.

5.2. Causative Constructions Involving a Relative Clause

Causative constructions involving a relative clause follow as below.

(36) Caki$_i$-ka iki-ess-ta-nun sasil-i John$_i$-ul
     self-NOM win-PAST-DEC-COMP fact-NOM John-ACC
     kippu-key ha-yss-ta

---

21) The following examples can show that the [-R] and the [prominent] cannot co-occur.
   (i) * himself ate an apple
   (ii) * himself liked John
   (iii) * The politician annoyed a picture of himself
22) A reviewer suggested the possibility that Condition C can replace (35iv). As mentioned in the footnote (24), Condition A, B and C have a good reason to be separated out. The footnote (21) shows the examples supporting for 35(iv). In these examples, (ii) only can be explained by Condition C. For this reason, I keep 35(iv) for this paper, though more rigorous tests are required.

please-CAUS do-PAST-DEC

'The fact that self won pleased John'

(37) After TRANSFER: [$_{CP}$ [$_{TP}$ John$_i$-ul [$_{T'}$ [$_{NP}$ [$_{CP}$ [$_{TP}$ caki$_i$-ka [$_{vP}$ iki-ess-ta]-nun]] sasil-i] [vP (John-ul) kippu-key ha-yss-ta]]]]

In (36), *caki* is bound backward to John. This is against c-command requirements between two NPs, inducing a lot of problems in the binding theory. The previous discussions couldn't handle this case. But if we assume the [prominent] feature on T, *John* is activated to undergo Agree on Probe T. And then the [-R] feature of *caki* also undergoes Agree on T by the phi-feature match as in (37). Now let us take a look at the following examples.

(38) *?John$_i$-i   iki-ess-ta-nun   sasil-i   caki$_i$-ul

John-NOM win-PAST-DEC-COMP fact-NOM self-ACC

kippu-key ha-yss-ta

please-CAUS do-PAST-DEC

'The fact that John$_i$ won pleased self$_i$'

(39) After TRANSFER: [$_{CP}$ [$_{TP}$ caki-lul [$_{T'}$ [$_{NP}$ [$_{CP}$ [$_{TP}$ John-i iki-ess-ta]-nun] sasil-i] [$_{vP}$ (caki-lul) kippu-key ha-yss-ta]]]]

The binding between *John* and *caki* cannot be obtained in (38). If we apply the prominency checking to (38), *caki* should be activated to undergo Agree on T where its [prominent] feature is checked off. The [prominent] feature cannot be eliminated, since *caki* is not prominent according to (35iv). The [-R] cannot be checked off, since there is no thematically prominent referential NP, when the Agree operation is undertaken, as seen in (39).

6. Expletives and Psych-verbs

Expletive constructions containing an anaphor have been more extensively discussed in Lee (2001a) under the minimalist framework, using the assumption on the [-R] and the Agree operation. The

following sentences are grammatical, since the [-R] is valued and eliminated by the Agree operation.

(40) They$_i$ said that it is unlikely that pictures of each other$_i$ are on sale.

(41) They$_i$ think that it is a pity that pictures of each other$_i$ are hanging on the wall

A question arises about the following sentences. The sentence (42) below is wrongly predicted as a correct sentence, since *each other* can be bound to the matrix *they* by the Agree operation.

(42) *They$_i$ think that it surprised each other$_i$ that they$_i$ won

(43) *John$_i$ thinks that it surprised himself$_i$ that he$_i$ won

Based on the native speakers' judgment,[23] the above sentences are not acceptable against our prediction. The anaphor in (42) should be bound to the matrix subject, since the [-R] feature should undergo Agree on the matrix T. (43) should be correct with the same reason, but it is not. Now how can we block to generate such wrong sentences within our analysis?

I argue that problems are not in our analysis, but are involved with the structure having a psych-verb *surprise*. The expletive constructions at issue contain psych-verb constructions. The derivation after TRANSFER should be the one for psych-verb constructions. See the following.

(44) *They think that [each other] it surprised (each other) that they won

(45) *John thinks that [himself] it surprised (himself) that he won

In the above constructions, *surprise* belongs to psych-verbs. The

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anaphor itself is in the higher position thematically as an Experiencer object, *it* being the lower Theme, which makes the whole sentence ungrammatical (Recall (35iv).).   It seems that anaphors cannot be an Experiencer object in psych-verb constructions with the expletive Theme subject, since they can never be bound to the Theme subject which is the only possible antecedent in those constructions. Other examples involving psych-verbs contained in *it*-constructions (Chomsky 1981) are given below.

(46) *They$_i$ think that it bothered each other$_i$ that...

(47) *They$_i$ think that it bothered themselves$_i$ that...

The ungrammaticality in (46) and (47) is due to the base generation where *bother* cannot take the anaphor Experiencer object with the expletive Theme subject. However, the following sentences vary in the degree of grammaticality.

(48) They bothered each other

(49) They frightened each other

(50) They surprised each other

(51) ? They concerned each other

(52) ?Politicians depressed each other

(53) ?Politicians worries each other

(54) ?*John bothered himself

(55) John frightened himself

(56) John surprised himself

(57) ?*John depressed himself

(58) ?*John worries himself

(59) John fears himself

By native speakers' judgment, when we use the reciprocal 'each other' all the sentences are better than those with the reflexive, *himself*. The less acceptability of (51-53) is due to the fact that the more prominent Experiencer NP is anaphors rather than being a referential NP.

From (54-59), (55), (56) and (59) are all right, while the rest of them are not acceptable. The reason could be found in Grimshaw (1990) where the subjects of those three sentences have the agentive reading qualified as the most prominent NPs that can antecede the reflexive. The rest of the sentences show that the reflexives are the most prominent NPs as Experiencers. They are supposed to antecede the Theme subject after TRANSFER, which makes those derivations out as uninterpretable. The sentences (54-59) will have (60-65) derivations after TRANSFER.

(60) [CP [TP himself [T′ John T [vP bothered (himself)]]]]
(61) [CP [TP John T [vP frightened himself]]]
(62) [CP [TP John T [vP surprised himself]]]
(63) [CP [TP himself [T′ John T [vP depressed (himself)]]
(64) [CP [TP himself [T′ John T [vP worries (himself)]]]]
(65) [CP [TP John T [vP fears himself]]]

Now we have a good reason why (55), (56) and (59) are acceptable, while the other sentences are not. The unacceptable sentences enhance their grammaticality, when we change the Theme subject to the NP including a reflexive and the Experiencer object to the referential NP.

(66=51) Pictures of each other concerned them
(67=52) Pictures of each other depressed politicians
(68=53) Pictures of each other worried politicians
(69=54) A picture of himself bothered John
(70=55) A picture of himself frightened John
(71=57) A picture of himself depressed John
(72=58) A picture of himself worried John

These examples are in contrast to the examples with expletives that are not acceptable at all, regardless of the psych-verb classes. This implies that the expletive subjects cannot be compatible with the reflexive in psych-verb constructions. It seems that both the expletives

and the reflexives are not prominent enough to do the prominency checking. On the other hand, in the psych-verb constructions the prominent Experiencer object seems to save the sentence by the prominency checking. My research is not complete in handling these data, requiring further study.

7. Conclusion

Introduction of the notion of prominency is not new in the area of binding theory. In Chomsky (1981), the notion of SUBJECT is also related with prominency. He said that the notion SUBJECT accords with the idea that the subject is the most prominent nominal element in some sense, taking INFL to be the head of S (Chomsky, 1981, p. 209). He handled the long-distance binding phenomena with the notion of accessible SUBJECT. I argued in this paper that the long lasting idea of prominency should be structurally noticed and checked by Agree after TRANSFER and the anaphoric feature [-R] involving psych-verb and causative constructions takes advantage of the prominency checking, being bound to the prominent and referential NP in the higher position.

Accordingly, psych-verbs and causative constructions that were not included in the core data of the binding theory could be accounted for with the anaphoric feature checking and the prominency checking within the recent development of minimalism. Positing the [-R] feature of the anaphor was not unnatural, since the anaphor with no referential features should do something to satisfy the Full Interpretation at SEM. Positing the [prominent] feature was not unnatural either, since the prominency should be noticed at SEM not only for the anaphor binding but for other constructions such as focused constructions and scope related constructions that induce a change in meaning.

This research, however, is limited by handling a narrow range of data in Korean and English. Our analysis should be tested to constructions in general more fully and to a variety of languages, and should be expanded to interpretation of pronouns[24) 25)] in the end. Though numerous problems remain unsolved, our analysis is meaningful

in that a large group of data that belong to psych-verbs and causatives was incorporated into the general binding phenomena under the minimalist framework; otherwise it would have been put aside as logophoricity effects. In conclusion, there seems to be a syntactic process for the anaphors to recover their references and thereby to obtain an interpretation at SEM, though logophoricity effects cannot be completely denied in the area of binding theory.

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24) A reviewer asked if pronouns can be accounted for by the prominency checking, since they have less referentiality, compared to the regular nouns, and have dependency within a sentence. I think that pronouns are different from anaphors in referentiality, since they can basically stand alone within a sentence, though they are dependent on another NP by coreference sometimes. Chomsky (1992, 1995) tries to separately explain condition A, B and C, because the distribution of anaphors and pronouns is not completely complementary and the reconstruction effects apply to pronouns only. Thus, it might not be necessary to treat both anaphors and pronouns together in our analysis. The interaction between those two remains for further research.

25) A reviewer asked how quantifiers can be explained in the proposed system, since they are nonreferential and dependent on another NP like reflexives. I leave this issue for further study, restricting our discussion to reflexives, in particular, backward reflexives only.

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