An Approach to Structural and Thematic Binding

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Shin, Kyung-sik. 2001. An Approach to Structural and Thematic Binding. *The Linguistic Association of Korea Journal*, 9(2), 23-48.
Chomsky (1981, 1986) and Chomsky and Lasnik (1993), among others, develop a theory of anaphora, the structural binding theory, in which the structural notions of "c-command" and "government" are central ones. Pointing out some empirical problems with the structural binding theory, Reinhart and Reuland (1991, 1993) and develop a theory of anaphora, the thematic binding theory, in which the notion of the argument structure of a predicative head is a central one. Pointing out some problems with the thematic binding theory, I will propose the structural and thematic binding theory, into which important insights from both the structural binding theory and the thematic binding theory are incorporated. **(Korea Military Academy)**

1. Introduction

Chomsky (1981,1986) proposed a binding theory which uses the structural notions such as "c-command" and "government." Pointing out some empirical problems with Chomsky's binding theory, Reinhart and Reuland (1993, henceforth R&R) proposed their own binding theory in which the notion of the argument structure of a predicative head is a central one. In this article, I will point out some empirical and conceptual problems with the R&R's binding theory and propose a binding theory which uses not only the notion of c-command but also the notion of the argument structure of a predicative head. For ease of reference, I will call Chomsky's binding theory a "structural binding

theory," R&R's binding theory a "thematic binding theory," and mine a "structural and thematic binding theory."

2. Thematic Binding Theory

To capture both the structural condition and the locality condition on anaphora, Chomsky (1981, p. 188) proposes the following binding principles:

(1) Principle A: An anaphor is bound in its governing category.
Principle B: A pronominal is free in its governing category.
Principle C: An R-expression is free.

Pointing out some empirical problems with the structural binding theory, R&R propose the thematic binding theory. The binding conditions R&R propose are given in (2), while the necessary definitions are given in (3).

(2) Conditions[1] (R&R, p. 578)
A: A reflexive-marked syntactic predicate is reflexive.
B: A reflexive semantic predicate is reflexive-marked.

(3) Definitions (R&R, p. 578)
a. The *syntactic predicate* formed of (a head) P is P, all its syntactic arguments, and an external argument of P.
The *syntactic arguments* of P are the projections assigned θ-role or Case by P.
b. The *semantic predicate* formed of P is P and all its arguments at the semantic level.
c. A predicate is *reflexive* iff two of its arguments are coindexed.

1) R&R argue that Condition A applies at LF, while Condition B applies at the more abstract level of the semantic interpretation.

d. A predicate (formed of P) is *reflexive-marked* iff either one of P's arguments is SELF anaphor or P is lexically reflexive.

R&R argue that, among the anaphoric expressions (pronouns, SE anaphors, and SELF anaphors), only SELF anaphors can function as reflexive-markers.[2)]

Let us now see how Condition A works, considering the following examples:

(4) a. *Mary$_1$ loves myself$_2$.
b. Mary$_1$ loves herself$_1$.

In (4a), the SELF anaphor *myself* functions as a syntactic argument of the predicative head *love*, since this verb assigns both θ-role and Case to the SELF anaphor, and there is an external argument of the verb, that is, the subject *Mary*. Thus a reflexive-marked syntactic predicate is formed of *love* but this syntactic predicate is not reflexive, since the two arguments of the syntactic predicate formed of *love* are not coindexed with each other. Thus, Condition A correctly predicts that (4a) is ill-formed.

In (4b), a reflexive-marked syntactic predicate is formed of *love* and this reflexive-marked syntactic predicate is reflexive, since the two arguments of the syntactic predicate formed of *love* (*Mary* and *myself*) are coindexed with each other. Thus, Condition A correctly predicts that (4b) is well-formed.

Let us consider how Condition A works in the following Exceptional Case-Marking (ECM) constructions:

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2) R&& distinguish the SELF anaphor from the SE (simplex expression) anaphor. The former refers to the morphologically complex anaphors like English *himself* and Dutch *zichzelf* while the latter refers to the morphologically simplex anaphors like *zich* in Dutch.

(5) a. *John$_1$ saw myself$_2$ run.
b. John$_1$ saw himself$_1$ run.

In (5a), although *see* does not assign a θ-role to the anaphor *myself* it assigns an accusative Case to it through the exceptional Case-marking. Thus, according to the definition of the syntactic argument in (3a), the anaphor *myself* is a syntactic argument of *see*. This verb also has its external argument *John* and thus a reflexive-marked syntactic predicate is formed of *see*. But the external argument and syntactic argument of *see* are not coindexed and thus the syntactic predicate formed of the verb *see* is not reflexive. As such, Condition A correctly predicts that (5a) is ill-formed.

But, in (5b), the reflexive-marked syntactic predicate formed of *see* is reflexive, since the two arguments of the syntactic predicate (*John* and *himself*) are coindexed. Thus Condition A correctly predicts that (5b) is well-formed. Note that, in (5b), the anaphor is also an external argument of the embedded verb *run* and thus a reflexive-marked syntactic predicate is formed of this verb. Thus Condition A incorrectly predicts that (5b) is ill-formed, since, in the embedded clause of (5b), there is no other argument of the syntactic predicate formed of *run* with which the anaphor can be coindexed. To solve this problem, R&R argue that Condition A applies not at SS but at LF and that *run* is raised to the matrix verb at LF. Then, at LF, no reflexive-marked syntactic predicate is formed of *run*. Thus Condition A applies only to the reflexive-marked syntactic predicate formed of *see*. Consequently, Condition A correctly predicts that (5b) is well-formed.

Let us now see how Condition B works. The following contrast between (6a) and (6b) forces R&R to introduce the notion of the semantic predicate as defined in (3b) and Condition B as formulated in (2):

(6) a. The queen$_1$ invited both Max$_2$ and herself$_1$ to our party.
b. *The queen$_1$ invited both Max$_2$ and her$_1$ to our party. (R&R:675)

Note that, while *both Max and herself* in (6a) and *both Max and her* in (6b) occupy the argument position of the syntactic predicate formed of *invite*, *herself* in (6a) and *her* in (6b) do not. As such, in (6a) and (6b), no reflexive syntactic predicate is formed of the predicative head *invite* but the SELF anaphor is required. To account for the contrast in (6), R&R propose that we should look at a more abstract level of the semantic interpretation of these sentences. According to R&R, these sentences have the following representation at the abstract level of the semantic interpretation, at which a semantic predicate is determined:

(7) the queen (x (x invited Max & x invited x)

Note that a reflexive semantic predicate is formed in the second conjunct, *x invited x*. Now Condition B in (2) correctly predicts that only the SELF anaphor *herself* is allowed in (6a)-(6b). From now on, I will call the abstract level of the semantic representation associated with Condition B an LF* for ease of reference.

Condition B also accounts for the following examples:

(8) a. Max_1 rolled the carpet_2 over him_1.
b. *Max_1 rolled the carpet_2 over it_2.
c. Max_1 rolled the carpet_2 over himself_1.
d. Max_1 rolled the carpet_2 over itself_2. (R&R:669)

Following Baker (1988), Hestvik (1991), and Marantz (1984), R&R assume that, among prepositions, locative or directional prepositions are predicative heads and thus they have their own argument structures. The preposition *over* in (8a)-(8d) is a locative preposition and so it is a predicative head. The first argument of *over* is an implicit argument, which is controlled by *the carpet* and thus is assigned the referential index of *the carpet*.[3] Then, only in (8b) and (8d), a reflexive semantic predicate is formed of the predicative head *over* at LF* and Condition B

applies. As such, Condition B correctly predicts that (8b) is ill-formed and (8d) is well-formed, since the reflexive semantic predicate formed of the predicative head *over* is reflexive-marked in (8d) but it is not in (8b). In (8a) and (8c), Condition B does not apply, since no reflexive semantic predicate is formed of *over*. Note that Condition A does not apply in (8c) and (8d), since there is no subject position within PPs and thus no syntactic predicate is formed of *over*.

R&R's Condition A and Condition B, however, cannot rule out the following examples:

(9) a. *Himself$_i$ criticized John$_i$.
    b. *Himself$_i$ criticized him$_i$.
    c. *Himself$_i$ criticized himself$_i$.
(10) a .*John$_i$ assigned John$_i$ to himself$_i$.
    b. *John$_i$ assigned him$_i$ to himself$_i$.
(11) a. *John$_i$ saw John$_i$ run.
    b. *John$_i$ saw him$_i$ run.

In (9a), Condition A is satisfied, since two arguments of *criticize* are coindexed. Condition B is also satisfied, since the reflexive semantic predicate formed of *criticize* is reflexive-marked by *himself*.

Note that both Condition A and Condition B apply in (9b) and (9c) and they are satisfied.

In (10a) and (10b), *assign* is a three-place predicative head and all the NPs occupy argument positions. Thus both Condition A and Condition B apply in (10a) and (10b) and they are satisfied.

In (11a) and (11b), Condition A does not apply, since no reflexive-marked syntactic predicate is formed of the embedded verb

3) By "implicit argument," I mean, following Williams (1987), an argument which is present at the argument structure of a predicative head but is not assigned or realized in syntax.

run or the matrix verb *see*. No reflexive semantic predicate is formed of the matrix verb *see* either, since the matrix subject and the ECM subject are not coarguments of the semantic predicate formed of *see*.

In short, neither Condition A nor Condition B can rule out the examples in (9)-(11). Thus R&R propose that these examples should be accounted for neither by Condition A nor by Condition B but by the following Chain Condition:

(12) Chain Condition (R&R, p. 696)
A maximal A-chain $(\alpha_1,...,\alpha_n)$ contains exactly one link — α_1 — that is both +R and Case-marked.

R&R define +R NP as follows:

(13) Definition of a +R NP (R&R, p. 697)
An NP is +R iff it carries a full specification for Φ-features and structural Case.

According to Chain Condition, only the head of an A-chain can be Case-marked +R NP.

Let us examine how Chain Condition can account for the data in (9)-(11). In (9a)-(9c), the subject NPs and the object NPs form A-chains, since the A-movement is possible from the object positions to the subject positions. In (9a)-(9b), the A-chains, $(himself_1,John_1)$ and $(himself_1,him_1)$, violate Chain Condition, since the heads of the chains are not +R NPs and the tails of the chains are Case-marked +R NPs.

In (10a)-(10b), the subject NPs and the direct object NPs form A-chains, since the A-movement is possible from the direct object positions to the subject positions. But these A-chains violate Chain Condition, since not only the heads of the chains but also the tails of the chains are Case-marked +R NPs. In (9c), the A-chain $(himself_1,himself_1)$ violates Chain Condition, since the head of the chain

is not a +R NP.

In (11a)-(11b), the matrix subject NPs and the embedded subject NPs form A-chains, since the A-movement is possible from the embedded subject positions to the matrix subject positions. But these A-chains violate Chain Condition, since not only the heads of the chains but also the tails of the chains are Case-marked +R NPs.

3. Problems with Thematic Binding Theory

Although R&R argue that the thematic binding theory can solve some empirical problems with the structural binding theory, it also has some empirical and conceptual problems. The empirical problems come from Condition B and Chain Condition, and the conceptual problem comes from the redundancy between Condition B and Chain Condition.

3.1. Empirical Problem

3.1.1. Problem with Condition B

Let us first consider the empirical problems associated with Condition B. Lasnik (1989) shows that the following sentence in Thai is well-formed:

(14) $coon_1$ choop $coon_1$.
John likes John
'John likes John.' (Lasnik 1989, p. 153)

Note that Condition B incorrectly predicts that this sentence is ill-formed, since the reflexive semantic predicate formed of the verb *choop* 'likes' is not reflexive-marked.

We can find some counterexamples to Condition B also in Korean. Before presenting the actual counterexamples from Korean, let us

examine the system of anaphors and pronominals in Korean. Korean has the following system of pronominals:

(15) Pronominals in Korea

person	singular	plural
1st	na 'I'	uri(-deul) 'we'
2nd	neo 'you'	neohi-deul 'you'
3rd	geu 'he'	geu-deul 'they'
	geunyeo 'she'	geunyo-deul 'they'
	geugeos 'it'	geugeos-deul 'they'

The anaphors corresponding to the pronominals above are as follows:

(16) Anaphors in Korean

1st nae-jasin 'myself' uri(-deul)-jasin 'ourselves'
2nd neo-jasin 'yourself' neohi-deul-jasin 'yourselves'
3rd geo-jasin 'himself'
geu-deul-jasin 'themselves'([+human])
geunyeo-jasin'herself'
geunyo-deul-jasin' themselves([+human])
geugeos-jache'itself'
(*geugeos-jasin'itself')
geugeos-deul-jache 'themselves'([-human])
(*geugeos-deul-jasin 'themselves')

Note that the anaphors above are formed by attaching the suffix *-jasin* or *-jache* to the corresponding pronominals. The suffix *-jasin* can be attached only to the [+human] pronominal, whereas the suffix *-jache* can be attached only to the [-human] pronominal. There are other anaphors too in Korean. *jagi* is a 3rd person, singular anaphor but it is unspecified for the gender feature. *jasin* is a singular anaphor but it is

unspecified for the person and gender feature, *jagi* and *jasin* together can form a complex anaphor *jagijasin*, which is 3rd person, singular, but unspecified for the gender feature.

Let us now turn to the counterexamples to Condition B from Korean. The following sentences in (17) are all well-formed:

(17) a. Cheolsu$_1$-ga jagi$_1$-reul jeungoha-n-da.
Cheolsu -Nom SE -Acc hate -Pre-Dec
'Cheolsu hates himself.'
b. Cheolsu$_1$-ga jagi$_1$-reul bipanha-yeoss-da.
Cheolsu -Nom SE-Acc criticize-Pst -Dec
'Cheolsu criticized himself.'

Note that, in the sentences (17a)-(17b), the reflexive semantic predicates are formed of the verbs and thus these sentences are subject to Condition B. Condition B will incorrectly predict that the sentences (17a)-(17b) are all ill-formed, if *jagi* is not a reflexive-marker. In fact, there is an evidence that indicates that *jagi* is not a reflexive-marking anaphor. In the following sentence,

(18) Cheolsu$_1$-neun Yeongsu$_2$-ga jagi$_{1,2}$-reul jeungoha-n-da -go
Cheolsu-Top Yeongsu-Nom SE -Acc hate -Pre-Dec-Comp
saenggagha-n-da.
think-Pre-Dec
'Cheolsu thinks that Yeongsu hates himself.' or 'Cheolsu thinks that Yeongsu hates him.'

jagi can be coreferential not only with the embedded subject *Yeongsu* but also with the matrix subject *Cheolsu*. If *jagi* were a reflexive-marking SELF anaphor, it would be coreferential only with the embedded subject *Yeongsu* but not with the matrix subject *Cheolsu* due to Condition A. If we replace the simplex anaphor *jagi* in (18) with the

complex anaphor *jagijasin*, we have the following sentence:

(19) Cheolsu$_1$-neun Yeongsu$_2$-ga jagijasin$_{*1,2}$-reul jeungoha-n-da-go
Cheolsu -Top Yeongsu-Nom himself-Acc hate-Pre-Dec-Comp
saenggagha-n-da.
think-Pre-Dec
'Cheolsu thinks that Yeongsu hates himself.'

In (19), the complex anaphor *jagijasin* cannot be coreferential with the matrix subject *Cheolsu* but it can be coreferential only with the embedded subject *Yeongsu*. Thus, (18) and (19) show that *jagi* is not a reflexive-marker but *jagijasin* is. I suggest that this is because *jagi* and *jagijasin* have the following morphosyntactic structures (20a) and (20b), respectively:

(20) a. [$_{NP}$ jagi [$_{N'}$ e]]
b. [$_{NP}$ jagi [$_{N'}$ jasin]]

jagi occupies the determiner position of an NP and *jasin* occupies the head N position of an NP. As such, I suggest that, in (20), *-jasin* in *jagijasin* requires that the two arguments of the predicative head *jeungoha* 'hate' (*Yeongsu* and the determiner *jagi* in *jagijasin*) be identical and so *jagijasin* can be coreferential only with the embedded subject *Yeongsu*. In short, *jagi* is a SE anaphor and thus cannot be a reflexive-marker, while *jagijasin* is a SELF anaphor and thus can be a reflexive-marker.

Recall that, as mentioned in (3d), a predicate can be reflexive-marked, either when one of the arguments of a predicative head is a reflexive-marking SELF anaphor or when the predicative head itself is lexically reflexive. As pointed out by Faltz (1985, p. 5), in the following sentences,

(21) a. John shaved.
b. John bathed.

the predicative heads *shave* and *bathe* are lexically reflexive. Thus, for example, (21a) means that John shaved himself but it cannot mean that John shaved Bill. According to R&R, at LF*, (21a) and (21b) would have the following representations (22a) and (22b), respectively:

(22) a. John (x (x shaved x))
b. John (x (x bathed x))

Thus reflexive semantic predicates are formed of *shave* and *bathe* in (21a) and (21b) and so Condition B requires that these semantic predicates be reflexive-marked. This requirement cannot be met by a reflexive-marking SELF anaphor, since there is no such anaphor in (21a) and (21b). To account for the examples such as (21a) and (21b), R&R argue that Condition B can also be satisfied when the predicative head itself is lexically (=intrinsically, semantically) reflexive.

Let us check whether, in the sentences (17a)-(17b), Condition B can be satisfied by the predicative heads themselves being lexically reflexive. The following sentences from Korean are all well-formed:

(23) a. Cheolsu$_1$-ga Yeongsu$_2$-reul jeungoha-n -da.
Cheolsu -Nom Yeongsu-Acc hate -Pre-Dec
'Cheolsu hates Yeongsu.'
b. Cheolsu$_1$-ga Yeongsu$_2$-reul bipanha-yeoss-da.
Cheolsu -Nom Yeongsu-Acc criticize-Pst-Dec
'Cheolsu criticized Yeongsu.'

If the verbs *jeungoha* and *bipanha* in (23a)-(23b) were lexically reflexive, they would not allow the object NP *Yeongsu* which is disjoint in reference from the subject NP *Cheolsu*. Then, the reflexive predicates

formed of the verbs in (17a)-(17b) are reflexive-marked neither by the SELF anaphors nor by the predicative heads themselves being lexically reflexive. Consequently Condition B incorrectly predicts that the sentences (17a)-(17b) are all ill-formed.

3.1.2. Problem with Chain Condition

Let us now consider the empirical problem with Chain Condition. Note that (14) from Thai constitutes a counterexample to Chain Condition. In (14), both the first *coon* 'John' and the second *coon* are fully specified with respect to both Φ-features and Case features, and they are assigned the structural Cases (nominative Case and accusative Case). Then, since both the head and the tail of the A-chain ($coon_1$,$coon_1$) are Case-marked +R NP, this A-chain violates Chain Condition. Consequently, Chain Condition incorrectly predicts that (14) is ill-formed.

Additional counterexamples to Chain Condition come from Korean:

(24) Cheolsu$_1$-neun [jagi$_1$-ga jasin$_1$-eul jeil sarangha-n-da -go]
Cheolsu -Top SE-Nom self-Acc most love-Pre-Dec-Comp
saenggagha-n-da
think-Pre-Dec
'Cheolsu thinks that he loves himself most.'

jagi and *jasin* form an A-chain ($jagi_1$,$jasin_1$). The tail of the chain is -R NP, since *jasin* is unspecified for the features of person and gender, although it is fully specified for the Case feature. Thus, the use of *jasin* in the tail of the chain causes no problem with Chain Condition. But let us consider the head of the chain, *jagi*. This is unspecified for the gender feature, although it is fully specified for the Case feature. Thus it is a -R NP. Consequently, the head of the chain ($jagi_1$,$jasin_1$) is also a -R NP and thus Chain Condition incorrectly predicts that (24) is

ill-formed in Korean.

Let us now consider the A-chain (jagi$_1$geujasin$_1$) in the following example:

(25) Cheolsu$_1$-neun [jagi$_1$-ga geujasin$_1$-eul jeil sarangha-n-da-go]
Cheolsu-Top SE-Nom himself-Acc most love-Pre-Dec-Comp
saenggagha-n-da.
think-Pre-Dec
'Cheolsu thinks that he loves himself most.'

The tail of the chain, *geujasin*, is fully specified for Φ-features and Case feature and thus it is a Case-marked +R NP. Thus Chain Condition is doubly violated, in the sense that the head of the chain *jagi* is a -R NP but the tail of the chain *geujasin* is a Case-marked +R NP. Thus Chain Condition incorrectly predicts that (25) is ill-formed.

3.1.3. Problem with Reinhart and Reuland's (1993) System

Let us consider the following English data:

(26) a. *John$_1$ accidentally assigned himself$_1$ to him$_1$.
b. John$_1$ accidentally assigned himself$_1$ to himself$_1$.

Note that Condition A cannot rule out (26a), since the reflexive-marked syntactic predicate formed of the verb *assign* is reflexive and thus Condition A is satisfied. Condition B cannot rule out (26a) either, since the reflexive semantic predicate formed of the verb *assign* is reflexive-marked by the SELF anaphor *himself* in the argument position and thus Condition B is satisfied. Now let us see whether Chain Condition can account for the ill-formedness of (26a). In (26a), the A-movement is possible from the position of *himself* to the position of *John* and thus *John* and *himself* form an A-chain. This

A-chain satisfies Chain Condition, since only the head of this chain is a Case-marked +R NP. But the A-movement is impossible from the position of *him* to either the position of *himself* or the position of *John*, as the following examples show:

(27) a. John accidentally assigned Bill to Mary.
b. *John accidentally assigned Mary$_1$ to t_1 .
c. *Mary$_1$ was accidentally assigned Bill to t_1 .

Thus, in (26a), *John*, *himself* and *him* do not form an A-chain and thus even Chain Condition cannot account for the ill-formedness of this sentence. Then, not only (26b) but also (26a) satisfies Condition A, Condition B, and Chain Condition. Consequently, none of the conditions of R&R's system can account for the ill-formedness of (26a).

3.2. Conceptual Problem

In this section, I will show that R&R's system also has the conceptual problem of redundancy between Condition B and Chain Condition. For example, note that not only Condition B but also Chain Condition can rule out the following English and Korean examples:

(28) a. *John$_1$ hates him$_1$.
b. *John$_1$ hates John$_1$.
(29) a. *Cheolsu$_1$-ga geu$_1$-reul jeungoha-n-da.
Cheolsu -Nom he -Acc hate-Pre-Dec
'Cheolsu hates him.'
b. *Cheolsu$_1$-ga Cheolsu$_1$-reul jeungoha-n-da.
Cheolsu-Nom Cheolsu-Acc hate-Pre-Dec
'Cheolsu hates Cheolsu.'

First of all, in each of the sentences in (28)-(29), a reflexive semantic predicate is formed of each verb and thus Condition B applies. But neither the names *John* and *Cheolsu* nor the pronouns *him* and *geu* are reflexive-markers. Therefore Condition B can rule out all the examples in (28)-(29).

The subject NP and the object NP in each of the examples in (28)-(29) form an A-chain. All the A-chains in these examples violate Chain Condition, since not only the names *John* and *Cheolsu* but also the pronouns *him* and *geu* are Case-marked +R NP. Consequently, both Condition B and Chain Condition can rule out all the examples in (28)-(29) redundantly.

4. Structural and Thematic Binding Theory

4.1. Principle B′

I pointed out above some empirical and conceptual problems with Condition B and Chain Condition. Instead of these conditions, I suggest the following condition which I call Principle B′:

(30) Principle B′
A pronominal must be free from its coarguments of a syntactic or semantic predicate formed of a predicative head of which the pronominal is an argument.

Note that I am incorporating into the formulation of Principle B′ the notion of c-command from the structural binding theory and the notion of the argument structure of a predicative head from the thematic binding theory. I suggest that Principle B′ operates at the interface between LF and LF*. In other words, to determine whether an NP at LF is the one from which a pronominal must be free, the representations of both LF and LF* must be considered.

We will keep Condition A for the time being. Let us say that our system includes only Condition A and Principle B′, and see whether our system can account for all the data which could be accounted for in R&R′s system. We have to ensure that the data accounted for by either Condition B or Chain Condition in R&R′s system can also be explained by our Principle B′ in (30). First of all, let us consider the English data accounted for only by Condition B in R&R′s system. In (6b), the pronominal *her* is not free from its coargument of the semantic predicate formed of *invite*, that is, *the queen*. Thus Principle B′ correctly predicts that (6b) is ill-formed.

Recall that only Condition B in R&R′s system can account for the contrast between (8b) and (8d). A syntactic predicate cannot be formed of the predicative head *over*, since there is no subject position in PPs. But a semantic predicate, whose first argument happens to be an implicit argument, can be formed of *over*. Note that this implicit argument of *over* is controlled by *the carpet*. Thus, in (8a) and (8b), although *the carpet* is not a coargument of the pronominals at LF, it is one at LF*. As such, the pronominals must be free from *the carpet*. So Principle B′ correctly predicts the contrast between (8a) and (8b).

Now let us consider the English data in (9)–(11) whose ill-formedness can be accounted for only by Chain Condition in R&R′s system.

Remember that we gave up Chain Condition. Then, how can we rule out the sentences in (9)–(11)? First of all, I suggest that we have to maintain Principle C of the structural binding theory. There have been some attempts to eliminate Principle C from the structural binding theory (Chomsky, 1982; Huang, 1982; Reinhart, 1983a, 1983b, 1986; Higginbotham, 1983; Montalbetti, 1984) but Lasnik (1989) convincingly argues that Principle C cannot be eliminated. Chomsky (1986, p. 166) in fact reintroduces it into his system of binding conditions. Following Lasnik, I suggest that Principle C does exist. In fact, it must be parametrized, since the sentence (14) from Thai is well-formed but the

sentences (31) and (32) from English and Korean corresponding to (14) are ill-formed:

(31) *John$_1$ likes John$_1$.
(32) *Cheolsu$_1$-ga Cheolsu$_1$-reul johaha-n-da.
Cheolsu-Nom Cheolsu-Acc like-pre-Dec
'Cheolsu likes Cheolsu.'

Thus English and Korean have to obey Principle C, whereas Thai does not have to obey it. So let us say that our system consists of Condition A, Principle B', and Principle C.

Now Principle C can rule out (9a), (10a), and (11a), since the accusative R-expressions in these sentences are not free.

In (9b), the subject NP and the object NP are coarguments of the syntactic predicate and the semantic predicate formed of *criticize*. Thus Principle B' correctly predicts that (9b) is ill-formed.

In (10b), the subject NP and the direct object NP are coarguments of the syntactic predicate and the semantic predicate formed of *assign*. Thus Principle B' can rule out (10b).

In (11b), although the matrix subject and the embedded subject are not the coarguments of the semantic predicate formed of *see*, they are the coarguments of the syntactic predicate formed of *see*. Thus Principle B' is violated in (11b).

Now let us consider (9c). Principle B' and Principle C do not apply in (9c). Both the subject reflexive and the object reflexive occupy the argument positions of the predicative head *criticize*. Thus a reflexive-marked syntactic predicate is formed of *criticize* and it is reflexive, since the subject NP and the object NP are coindexed. Therefore Condition A is satisfied in (9c). Then, none of the Condition A, Principle B', and Principle C in our system can rule out (9c). This problem will be dealt with later in section 4.2.

In short, I have shown above that the data in (9)-(11), except (9c),

which are accounted for only by Chain Condition in R&R's system can also be accounted for in my system.

Now let us consider the data in (26). Recall that none of the conditions in R&R's system could account for the ill-formedness of (26a). Now note that the ill-formedness of (26a) can be explained by our Principle B'. In (26a), *John*, *himself*, and *him* are coarguments of both the syntactic predicate and the semantic predicate formed of the verb *assign*. Thus *him* must be free from *John* and *himself* but it is not. Therefor Principle B' correctly predicts that (26a) is ill-formed.

4.2. Principle A'

Now let us consider the following examples:

(33) a. *John$_1$ said that himself$_1$ ran.
b. *Himself ran.
c. *Himself$_1$ criticized himself$_1$.

(33c) is repeated from (9c). Remember that the ill-formedness of (33c) could not be accounted for by any of Condition A, Principle B', and Principle C in my system.

Recall that R&R account for the ill-formedness of (33a)-(33b) by Condition A. Remember also that R&R rule out (33c) with Chain Condition.

Note that (33a)-(33b) pose no problem for my system, since Condition A is included in my system and can correctly rule out these sentences. I, however, gave up Chain Condition. Then, how can (33c) be ruled out in my system? Here I propose that all the sentences in (33) be ruled out by the following Principle A', which will replace Condition A:

(34) Principle A´
A SELF anaphor must be bound by its coarguments of the syntactic predicate formed of a predicative head of which the SELF anaphor is an argument.

Now let us see how Principle A´ can account for the ill-formedness of (33a)-(33c). In (33a)-(33b), *himself* is a subject and thus a syntactic predicate is formed of the predicative head *run*. Then Principle A´ applies to the SELF anaphors in (33a)-(33b). But the SELF anaphor *himself* cannot be bound by its coargument, since *run* is a one-place predicative head and thus it has no other argument than *himself*. Therefore Principle A´ is violated in (33a)-(33b). In (33c), the first *himself* is a subject and thus a syntactic predicate is formed of the predicative head *criticize*. Therefore Principle A´ applies to the SELF anaphors in (33c). The object SELF anaphor satisfies Principle A´, since it is bound by its coargument, the subject SELF anaphor. The subject SELF anaphor, however, cannot satisfy Principle A´, since it is not bound by its coargument, the object SELF anaphor. Consequently Principle A´ correctly predicts that (33a)-(33c) are all ill-formed.

Since we eliminated Condition A from our system and introduced Principle A´ into our system, we have to make sure that all the data accounted for Condition A can also be accounted for by Principle A´. Let us consider the following data which constitute counterexamples to Principle A but are accounted for by Condition A in R&R:

(35) a. [There were five tourists in the room apart from myself]. (Reinhart and Reuland, 1993, p. 669)
b. [This paper was written by Ann and *myself*]. (Ross, 1970, p. 228)
c. Max$_1$ boasted that [the queen$_2$ invited Lucie and himself$_1$ for a drink]. (Reinhart and Reuland, 1993, p. 670)
d. [It angered John$_1$ that Mary$_2$ should have the egotism to try [PRO$_2$ to attract a man like himself$_1$]]. (Zribi-Hertz, 1989, p. 718)

In (35a)-(35b), *apart from* and *by* are not predicative heads which have their own argument structures and thus no syntactic predicate is formed of a predicative head of which the SELF anaphors are arguments. Therefore Principle A′, unlike Principle A, does not rule out (35a)-(35b).

In (35c), the conjunctive NP *Lucie and himself* is an argument of the syntactic predicate formed of the verb *invite* but the SELF anaphor *himself* is not, since it is embedded within the argument *Lucie and himself*. Thus no syntactic predicate is formed of a predicative head of which the SELF anaphor *himself* is an argument. Therefore, Principle A′ does not rule out (35c).

In (35d), *like* is not a predicative head. The verb *attract* is a predicative head of which a syntactic predicate is formed. The NP *a man like himself* is an argument of the verb *attract* but the SELF anaphor *himself* is not, since it is embedded inside the NP *a man like himself*. Therefore Principle A′ does not rule out (35d).

Let us see whether Principle A′ can account for the ECM examples in (5). In (5a), a syntactic predicate is formed of *run* and thus Principle A′ applies. *myself* is not bound by its coargument of the syntactic predicate formed of *run*, since *run* is a one-place predicative head. Therefore Principle A′ correctly predicts that (5a) is ill-formed. Principle A′, however, incorrectly predicts that that (5b) is also ill-formed, since *himself* is not bound by its coargument of the syntactic predicate formed of *run*. To overcome this problem, I, following R&R, suggest that, at LF, the embedded verbs in ECM constructions undergo a head movement to the matrix verbs. Then, (5a) and (5b) have the following LF-representations (36a) and (36b), respectively:

(36) a. *[$_{IP}$ John$_1$ run$_3$-saw [$_{IP}$ myself$_2$ t_3].
b. [$_{IP}$ John$_1$ run$_3$-saw [$_{IP}$ himself$_1$ t_3].

Now, at LF, no syntactic predicate is formed of *run*, while a syntactic predicate is formed of the complex verb *run-see*. Thus Principle A′ does not apply in the embedded IPs in (36a) and (36b). *myself* and *himself* are the syntactic arguments of the complex verb *run-see*, since the θ-role of *run* and the accusative Case of *see* are assigned to them. Therefore Principle A′ applies to the anaphors in (36a) and (36b) and correctly predicts that (36a) is ill-formed but (36b) is well-formed.

5. Apparent Counterexamples to Principle A′

Let us consider the following sentence from Korean:

(37) Cheolsu$_i$-neun geujasin$_i$-i yeongrihada-go saenggagha-n-da.
Cheolsu -Top ? -Nom is smart-Comp think-Pre-Dec
'Cheolsu thinks that he himself is smart.'

It is commonly assumed that *geujasin* in (37) corresponds to English *himself*. Let us follow this assumption for a moment. Then, the SELF anaphor *geujasin* in (37) occupies subject position and thus a syntactic predicate is formed of the embedded predicate *yeongriha* 'smart'. Then, Principle A′ applies to *geujasin* in (37). But *yeongriha* is a one-place predicative head and thus does not have any other argument by which the SELF anaphor *geujasin* in (37) can be bound. Note that the matrix subject *Cheolsu* cannot be an appropriate binder of the SELF anaphor *geujasin* in (37) with regard to Principle A′, since *Cheolsu* and the SELF anaphor *geujasin* are not coarguments of the same predicative head. Then, Principle A′ incorrectly predicts that (37) is ill-formed in Korean.

In the following example, the SELF anaphor *geujasin* occupies the object position of the embedded clause:

(38) Cheolsu$_1$-neun Yeongsu$_2$-ga geujasin$_{1,2}$-eul johaha-n-da-go
Cheolsu-Top Yeongsu-Nom ? -Ac like-pre-Dec-Comp
saenggagha-n-da.
think-pre-Dec
'Cheolsu thinks that Yeongsu likes himself,' or 'Cheolsu thinks that Yeongsu likes him.'

Yeongsu is the external argument of the embedded predicative head *johaha* 'like' and thus a syntactic predicate is formed of *johaha*. Then, Principle A' applies to the SELF anaphor *geujasin* and incorrectly predicts that *geojasin* can be coreferential only with the embedded subject *Yeongsu* but not with the matrix subject *Cheolsu*, since *Yeongsu* but not *Cheolsu* is in the coargument relation with the SELF anaphor *geujasin*.

I argue that the problems with Principle A' noticed in (37) and (38) are only apparent ones and the solution to these problems can be found in the close examination of the property of the morpheme *jasin* 'self'. As noticed in (16), we can make the SELF anaphors by attaching *jasin* to pronominals. Let us call this use of *jasin* a "reflexive" use. In addition to this use, *jasin* also has an "emphatic" use, as shown in the following examples:[4]

(39) a. Cheolsu-jasin -i geu chaeg-eul sa-ss-da.
Cheolsu-himself-Nom the book-Acc buy-Pst-Dec
'Cheolsu himself bought the book.'
b. Cheolsu-ga Yeongsu-jasin -ege geu chaeg-eul ju-eoss-da.
Cheolsu-Nom Yeongsu-himself-to the book-Acc give-Pst-Dec
'Cheolsu gave the book to Yeongsu himself.'

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4) Bickerton (1987:345) shows that English himself also has this emphatic use as below:
a. John himself did it.
b. I gave it to Bill himself.

Thus I suggest that the morpheme *jasin* in (37) corresponds not to *self* but to emphatic *himself* in English. As such, *geujasin* in (37) corresponds to not *himself* but *he himself* in English and thus is not subject to Principle A´.

Let us consider (38). Recall that the morpheme *jasin* is ambiguous in the sense that it can have either the reflexive use or the emphatic use. In (38), when *jasin* has the emphatic use, *geujasin* should be translated into not *himself* but *him himself*. Then *geujasin* is not subject to Principle A´. When -*jasin* in (38) has the reflexive use, *geujasin* in (38) should be translated into not *him himself* but *himself* and thus it is subject to Principle A´. Then Principle A´ requires that *Yeongsu* and *geujasin* be coindexed.

6. Conclusion

To solve some empirical problems with the structural binding theory, R&R propose a thematic binding theory in which lexical heads are distinguished depending on whether they have their own argument structures or not.

I, however, pointed out that R&R's thematic binding theory has its own empirical and conceptual problems. The empirical problems comes from Condition B and Chain Condition. The conceptual problem is the redundancy between Condition B and Chain Condition.

To overcome these problems, I proposed a structural and thematic binding theory into which the notion of c-command from the structural binding theory and the notion of argument structure of a predicative head from the thematic binding theory are incorporated. First, I gave up Condition B and Chain Condition and instead formulated Principle B´. Second, I suggested that Principle C should not be eliminated and included it into my system of conditions. Third, to account for some examples which cannot be explained by Condition A, Principle B´, or Principle C, I gave up Condition A and instead formulated Principle A´.

I also considered some potential counterexamples to Principle A´ and argued that these were not real ones but only apparent ones.

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