A REVISION OF THE NOTION *SUBJECT* AND ITS EFFECTS ON BINDING THEORY*

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This paper proposes a revision in the notion *SUBJECT*, which has been assumed, since Chomsky 1981, to include a subject NP and *AGR*. The proposal claims that *COMP*, instead of *AGR*, be counted as a *SUBJECT*. Since *SUBJECT* is a very basic notion in the binding theory, the revision yields far-reaching effects on bindings of various sorts of expressions. Descriptive and conceptual effects of the proposal are discussed and examined. It will be shown, in particular, that some ad hoc stipulations in Chomsky's binding theory may be eliminated on the assumption that *COMP* is a *SUBJECT*.

INTRODUCTION

0. This paper is concerned with one basic notion in the binding theory, i.e. *SUBJECT*, and proposes a revision in this notion, to the effect that *COMP* be included in a set of *SUBJECT*s. The notion *SUBJECT* plays a central role in the definition of binding category or governing category, on the basis of which the binding principles of the binding theory are defined. The binding principles are intended to cover bindings of various sorts of expressions. Thus, the revision of the notion *SUBJECT* is predicted to yield far-reaching effects on the whole binding theory. Due regard needs to be paid to the effects which it will bring about.

This paper is organized as follows: sections 1 and 2 present and motivate the hypothesis that *COMP* is a *SUBJECT*, mainly based on the argument on Extraposition; sections 3 and 4 consider empirical

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and conceptual effects that it will yield; and section 5 suggests further consequences that it is expected to have.

ACCOUNT OF EXTRAPOSITION BY BINDING THEORY

1.1. MANAGEABLE CASES. As Chomsky (1977 and 1981) points out, Extraposition obeys the Specified Subject Condition (SSC):

- (1) a. [_S We showed [_{NP1} a picture *t*] to Mary *of Sam*].¹
 b. *We showed [_{NP1} Bill's picture *t*] to Mary *of Sam*.

Extraposition is also subject to another opacity condition, the Tensed S Condition (TSC):

- (2) a. [_{S1} [_{S'2} That [_{NP1} a man *t*] came in *with red eyes*] surprised me].²
 b. * [_{S1} [_{S'2} That [_{NP1} a man *t*] came in] surprised me *with red eyes*].

The SSC and the TSC are recaptured, in the GB (government-binding) theory, as Binding Principle A (henceforth, simply 'Principle A'). Principle A and the other binding principle relevant to the later argument are presented in 3:

- (3) A. An anaphor is bound in its binding category
 B. A pronominal is free in its binding category

Principles A and B may be defined in terms of the notion *governing category* in place of *binding category*. However, we adopt here the definition of the binding principles based on binding category, since there is, in most cases, little empirical difference between the two notions,³ and in some cases binding category is more adequate and convenient than governing category, as will become clear soon.

The notion of binding category mentioned in 3 is defined as in 4 (Chomsky 1981: 220):

- (4) β is a binding category for α if and only if β is the minimal

¹ An element extraposed from the object position is supposed to be adjoined to VP, or moved under VP'. Cf. Baltin 1978.

² Extraposition from Subject is supposed to attach an extraposed element to S.

³ The sole problem with binding category that Chomsky (1981: 221) suggests is concerned with the treatment of a PRO subject as in i:

(i) John tried [PRO to win].

No problem arises, however, if PRO is stipulated not as a pronominal anaphor, but simply as an anaphor. See Nakajima (1984c) for this point and other effects of the present hypothesis on pronominals in general.

category containing α and a SUBJECT accessible to α

As *SUBJECT*, Chomsky 1981 assumes the two items: (i) AGR in a tensed clause, and (ii) a subject NP in an infinitival clause, a gerund, or an NP. The notion *accessibility* is defined as in 5:

(5) α is accessible to β if and only if (i) β is in the c-command domain of α , and (ii) assignment to β of the index of α would not violate 6

(6) $*[\gamma \dots \delta \dots]$, where γ and δ bear the same index

Furthermore, the following special coindexing device is assumed:

(7) AGR is coindexed with the NP it governs

Given these definitions, the fact in 1 regarding the SSC can be accounted for by Principle A if it is only assumed that a trace of Extraposition is an anaphor, more specifically, an $\bar{A}$ -anaphor to use the term of Aoun 1981. In the grammatical sentence 1a, the SUBJECT accessible to t is AGR, and the minimal category containing it and t is S, which is the binding category for t ; t is bound in its binding category by the extraposed PP, satisfying Principle A. (Though AGR is not overtly represented in examples throughout this paper, it is understood as present in every finite clause.) In the ungrammatical sentence 1b, on the other hand, the SUBJECT accessible to t is the possessive NP, *Bill's*, and the minimal category containing it and t is NP_i, which is the binding category for t ; t is not bound in its binding category by the extraposed PP, violating Principle A.

This consideration suggests that Principle A is operative in the account of grammaticality of sentences resulting from the application of Extraposition. We, thus, assume that a trace of Extraposition is an anaphor or $\bar{A}$ -anaphor, and that Principle A applies not only to A-anaphors, such as lexical anaphors and NP-traces (cf. §3), but also to $\bar{A}$ -anaphors, such as traces of Extraposition (cf. §5 furthermore).⁴ Accordingly, the term *bound* in Principle A, strictly ought to be read as *X-bound*, where the value of X is either A or $\bar{A}$.

1.2. UNMANAGEABLE CASES. Though Principle A has succeeded in handling the cases of the SSC, it cannot deal with the cases of the

⁴ Aoun (1981 and 1983) argues for the extension of the coverage of Principle A to $\bar{A}$ -anaphors on the basis of the data concerning Italian reciprocals and French *ne-cliticization*.

other opacity condition, i.e. the TSC. Recall the contrast between 2a and 2b, repeated below as 8a and 8b:

- (8) a. [_{S₁} [_{S'₂} That [_{NP₁} a man *t*] came in *with red eyes*] surprised me].
 b. * [_{S₁} [_{S'₂} That [_{NP₁} a man *t*] came in] surprised me *with red eyes*].

These sentences have two SUBJECTs, AGR in S'₂ and AGR in S₁, neither of which, however, are accessible to *t*. Due to 7, AGR in S'₂ has been coindexed with the embedded subject NP₁, and AGR in S₁ has been coindexed with the embedded sentential subject S'₂; both NP₁ and S'₂ are over *t*; thus, the assignment to *t* of the index of AGR in S₁ and the assignment to *t* of the index of AGR in S'₂ would both produce the configuration of the 'i-within-i', i.e. the configuration specified in 6, and must be ruled out owing to 5ii.

That *t* in 8a and 8b has no accessible SUBJECT means that it has no binding category. Under such circumstances, it is necessary to specially stipulate some category as the binding category for *t* independent of the presence of an accessible SUBJECT. For this end, Chomsky (1981: 220) proposes the following stipulation:

(9) A root S is a binding category for a governed element
 Assuming that *t* in 8 is governed by the head N in NP, the root S₁ is taken, by virtue of 9, to be the binding category for *t* both in 8a and 8b. Assuming alternatively that *t* is not governed by N, as will be claimed later, 9 does not apply to *t* in 8a and 8b, and therefore, *t* is assigned no binding category in either sentence. On either assumption, the grammatical sentence 8a and the ungrammatical one 8b show no difference as to a binding category, failing to be distinguished by Principle A.

1.3. OTHER PROBLEMS. Besides the contrast in 8 or 2, there are several other cases unmanageable by Principle A, all of which are, like 8, concerned with the extraposition from embedded clauses. First, consider the sentences in 10:

- (10) a. [_{S₁} [_{S'₂} For [_{NP₁} a review *t*] to appear this weekend *of John's new book*] will please them].
 b. * [_{S₁} [_{S'₂} For [_{NP₁} a review *t*] to appear this weekend] will please them *of John's new book*].

In both 10a and 10b, the embedded subject NP₁ cannot be a SUBJECT accessible to *t* because of 5ii, nor can AGR in S₁ be, because the

assignment to t of the index of the AGR would be excluded by 5ii. Then, recourse must be made to stipulation 9, which marks the root S_1 as the binding category for t . As t is bound in its binding category by the extraposed PP both in the grammatical sentence 10a and in the ungrammatical sentence 10b, the difference in grammaticality between them cannot be accounted for by Principle A.

Secondly, a similar contrast is observed in 11a and 11b, where Extraposition is applied in the post-verbal infinitival clauses:

- (11) a. [S_1 John has wished [S_2 for [NP_1 a review t] to appear of *Bill's book about French cooking*] for a long time].
 b. * [S_1 John has wished [S_2 for [NP_1 a review t] to appear] for a long time of *Bill's book about French cooking*].

In both 11a and 11b, the SUBJECT accessible to t is AGR in the main clause S_1 . The sentence S_1 is the minimal category containing it and t , and is the binding category for t . The trace t is bound in its binding category by the extraposed PP both in the grammatical sentence 11a and in the ungrammatical sentence 11b. The contrast between them, again, cannot be accounted for by Principle A.

Thirdly, Extraposition can move an element out of COMP. In this case too, the movement across a clause boundary is not allowed:

- (12) a. [S_1 I have been wondering [S_2 [$COMP$ which book t] I should read first by *Chomsky*] since yesterday morning].
 b. * [S_1 I have been wondering [S_2 [$COMP$ which book t] I should read first] since yesterday morning by *Chomsky*].

The two SUBJECTs in S'_2 , i.e. the subject NP and AGR, are not accessible to t because they do not c-command t . Assuming that t is governed by the head N in NP, the root clause S_1 will be taken, due to 9, as the binding category for t in both 12a and 12b. Alternatively, assuming that t is not governed by N, there is no binding category for t in either 12a or 12b. Again, on either assumption, the contrast between 12a and 12b cannot be accounted for by Principle A.

COMP AS SUBJECT

2. All the problematic cases in 8, 10, 11, and 12 indicate that Extraposition is actually subject to the Right Roof Constraint or the upward boundedness constraint of Ross 1967, and cannot move an element across a clause boundary. This is not always true, however. Compare the ungrammatical sentence 11b, repeated below as 13a,

with the grammatical sentence 13b:⁵

- (13) a. *[_{S1} John has wished [_{S2} for [_{NP1} a review *t*] to appear] for
a long time of *Bill's book about French cooking*].
b. [_{S1} John has expected [_{S2} [_{NP1} a review *t*] to come out] for
a long time of *Bill's book about French cooking*].

The sole syntactic difference between 13a and 13b is that the embedded clause in 13a has the complementizer *for*, while the one in 13b does not. This difference may be reasonably supposed to be the cause of the difference in the domain of binding. In other words, it can be supposed that the presence of *for* serves to constitute a binding category, and its absence helps the domain expand from the embedded clause to the main clause.

Then, we propose to modify Chomsky's assumption of *SUBJECT*, namely, that only a subject and *AGR* are *SUBJECT*s, and make the hypothesis, along the lines suggested in Nakajima 1984a, that *COMP* is also a *SUBJECT*. We assume that the node *COMP* is always present in finite clauses, and is present in infinitival clauses with the complementizer *for* in the surface structure, but is absent in infinitival clauses without *for* in the surface structure.

The hypothesis proposed, first of all, makes a distinction between 13a and 13b. In 13a, the embedded clause has *COMP*, a *SUBJECT* accessible to *t*, and is the minimal category containing the *SUBJECT* and *t*; *t* is not bound in its binding category by the extraposed PP, violating Principle A. In 13b, the embedded clause has no *SUBJECT*: *COMP* is absent, and the subject NP does not count, due to Sii, as accessible to the trace within it. Then, the trace *t* must seek a *SUBJECT* in the main clause, where it finds the subject NP or *AGR* accessible to it. So, the main clause is the binding category for *t*, within which *t* is actually bound by the extraposed phrase, satisfying Principle A.

The hypothesis similarly accounts for the contrast between 11a and 11b/13a. As is clear from the above, the binding category for *t* is the embedded clause both in 11a and 11b/13a. While *t* is bound within its binding category by the extraposed PP in the grammatical sentence 11a, it is not in the ungrammatical sentence 11b/13a.

The same consideration accounts for the contrast between 10a and 10b, where the *for-to* clause occupies the subject position rather than

⁵ Cf. Sano 1983.

the post-verbal position. The embedded *for-to* clause, containing COMP and *t*, is the binding category for *t*, within which *t* is bound by the extraposed PP in the grammatical sentence 10a, but not in the ungrammatical sentence 10b. Notice that this approach, unlike Chomsky's, does not necessitate such a special stipulation as 9 to provide a binding category for *t*.

Our hypothesis accounts for the contrast between 8a and 8b, as well. The embedded finite clause contains COMP and *t*, and is the binding category for *t*. In the grammatical sentence 8a, the trace *t* is bound by the extraposed PP within its binding category, whereas in the ungrammatical sentence 8b, it is not bound. Here too, no special subsidiary device like the one in 9 is needed to provide a binding category for *t* in the embedded subject.

Finally, we turn to the contrast between 12a and 12b, repeated below as 14a and 14b:

- (14) a. [_{S1} I have been wondering [_{S2} [_{COMP} which book *t*] I should read first *by Chomsky*] since yesterday morning].
 b. * [_{S1} I have been wondering [_{S2} [_{COMP} which book *t*] I should read first] since yesterday morning *by Chomsky*].

The embedded clauses have COMP, and are the binding category for *t*. The trace *t* is bound within the embedded clause in the grammatical sentence 14a, but not in the ungrammatical sentence 14b.

Here, the question may be raised whether the COMP in 14 is accessible to *t*, because the notion of accessibility consists of the c-command condition in 5i and the i-within-i condition in 5ii, neither of which the COMP seems to meet. As to 5ii, we will claim in §4.4 that the COMP does satisfy it. As to 5i, the COMP will not meet it if the notion *c-command* is defined in such a way that one element must not dominate the other. But, the COMP proves to meet 5i if *c-command* is defined in such a way that one element may dominate the other. The necessity of the definition in the latter way was demonstrated by Reinhart 1983. Along this line, we assume, in this paper, the following definition of *c-command*:⁶

⁶ 15 does not refer to the 'branching' condition, as is claimed in Nakajima (1984a and 1984b). The reasons are the following: 1⁰ Subcategorization and θ -assignment depend on the c-command condition, and a verb, whether transitive or intransitive, does not subcategorize for V"-complements nor does θ -assign them. 2⁰ Italian *ne*-cliticization is subject to the c-command condition, and does not apply to agentive intransitive verbs as well as polyadic transitive verbs. 3⁰ A

- (15) α c-commands β if the node immediately dominating α also dominates β

In 14, with $\alpha = \text{COMP}$ and $\beta = t$, the first node dominating α is S'_2 , which also dominates β ; so, the COMP c-commands t , and consequently counts as accessible to it.

It has been stated in §1.1 that either of the two notions, binding category or governing category, may be used to define Principles A and B. The sole difference between the two notions is that governing category, but not binding category, refers to a governor of a given element. Given the definition of c-command in 15, a preference must be given to binding category over governing category. For, some traces of Extraposition, e.g. the traces in 8 and 14, do not have a governor: they are traces of N'' -complements rather than of N' -complements (cf. Jackendoff 1977), and are, according to 15, not c-commanded, therefore not governed, by the head N .⁷ If governing category were adopted, these traces would have no category for binding.

Given that the traces in 8 are ungoverned, it turns out that Chomsky's 1981 theory is defective not merely in that it cannot distinguish the grammatical sentence 8a and the ungrammatical one 8b (cf. §1.2), but also in that it fails to ensure even the grammaticality of 8a. To do so, his theory would have to resort to the stipulation in 9, which marks a root S as a binding category independent of the presence of *SUBJECT*. However, since 9 is defined to apply to a governed element, it does not apply to the ungoverned trace in 8a. The trace in 8a would still be assigned no binding category.

In this way, all the problematic cases pointed out in §§1.2–1.3 can be handled by Principle A if only the hypothesis is made that COMP is also a *SUBJECT*. This hypothesis, according to Koster 1984, is needed to deal with the Dutch reflexive *zich*. Thus, the hypothesis is motivated by at least two distinct syntactic phenomena. The notion *SUBJECT* is a very basic component in the binding theory, so its revision is predicted to yield vast and far-reaching effects on the whole binding theory. In the next section, we examine its effects on

PP containing a trace is required to be properly governed (cf. Nakajima 1983 and 1984a), and cannot appear under V'' irrespective of whether V is intransitive or transitive.

⁷ This means that a trace of Extraposition is not subject to the ECP. Cf. Nakajima 1984a.

anaphors in general.

EFFECTS ON ANAPHORS

3.1. ORDINARY LEXICAL ANAPHORS. The class of anaphor is usually supposed to include lexical anaphors, i.e. reflexives and reciprocals, and NP-trace. Lexical anaphors may be divided into two groups, 'ordinary lexical anaphors' and 'picture noun anaphors', since there are many syntactic differences observed between them (cf. §3.3). In this subsection, we limit our attention to ordinary lexical anaphors (henceforth, simply 'lexical anaphors' or more simply 'anaphors'), namely, reflexives or reciprocals appearing alone as verbal object NPs or prepositional phrase object NPs not embedded within larger NPs.

The most noticeable consequence of the addition of COMP to a set of SUBJECTs is that an infinitival embedded clause, just as a finite clause, constitutes a binding category when it has the complementizer *for*. Thus, it is predicted from Principle A that the subject position of a *for-to* clause does not allow the occurrence of a lexical anaphor. This prediction is born out by the following examples:⁸

- (16) a. *I arranged [for myself to win].
 b. *We hate it [for each other to win].
 c. *They would be happy [for each other/themselves to win].
 d. *I am here [for myself to fish].

These are clearly in contrast with sentences embedding an infinitival clause without COMP, like *Mary thinks [herself to be happy]*. Incidentally, Chomsky (1981: 189) marks 16b as grammatical, contrary to his own judgment in Chomsky (1973: 251). Bouchard (1983: 32) notes, however, that the occurrence of an anaphor in the subject position of a *for-to* clause is marginally allowable only when the main predicate is a *want*-class one; sentences like 16b are not 'core anaphoric structures'.

A similar fact to 16 is observed when a *for-to* clause is embedded as a complement to N, or as a relative clause:⁹

- (17) a. *They recognized the necessity [for themselves to leave].
 b. *They haven't decided on the best way [for each other to do it].

⁸ These are cited, in order, from Postal 1974, Chomsky 1973, Kayne 1981 and Bouchard 1983, and Carroll 1983. Incidentally, reflexives are more reluctant to occur in these constructions than reciprocals. Cf. Lebeaux 1983.

⁹ From Postal 1974 and Williams 1980.

- c. *He bought the dog [for himself to play with].

If COMP were not a SUBJECT, these examples would incorrectly be marked as grammatical, since the binding category for the anaphors would be the main clause, where they would be linked to their antecedents.

The present hypothesis makes it possible for Principle A to account for the ungrammaticality of sentences like those in 18 without recourse to any special subsidiary device:

- (18) a. *[For himself to win] will please John.
b. *It will please John [for himself to win].

As the embedded clause has the complementizer *for*, it is the binding category for the reflexive, within which the reflexive fails to be bound by its antecedent.

Chomsky's theory will account for the ungrammaticality of 18a by resorting to the special subsidiary device in 9: it marks the root S as the binding category for the reflexive, but the reflexive is not c-commanded, and therefore, cannot be bound, by its antecedent. The distinction between our theory and Chomsky's lies not only in whether some special subsidiary device is needed, but also in the fact that our theory attributes the ungrammaticality of 18a to the failure of the anaphor to be bound in its binding category, while Chomsky's theory ascribes it to the failure of the anaphor to be c-commanded by its antecedent. That our theory is more adequate is clear from the fact in 18b, where a similar ungrammaticality arises even though the anaphor is c-commanded, and might be bound, by its antecedent.¹⁰

3.2. NP-TRACE. Another member of anaphor is NP-trace. Given that COMP is a SUBJECT, the distribution of NP-traces, as well as that of lexical anaphors, may be completely explained in terms of Principle A. Consider the following paradigm:

- (19) a. John is expected [*t* to win].
b. *John is longed [for *t* to win].
c. *John is expected [that *t* will win].
d. *John is longed [for Mary to date *t*].

This paradigm is completely parallel to that of lexical anaphors:

- (20) a. John expects [himself to win].

¹⁰ Reinhart 1980 argues that an extraposed sentential subject is dominated under VP.

- b. *John longs [for himself to win].
- c. *John expects [that himself will win].
- d. *John longs [for Mary to date himself].

In a of 19 and 20, a SUBJECT is absent in the embedded clause, but present in the main clause, which is the binding category for the anaphors. In b-d, COMP is present in the embedded clause, which is the binding category for the anaphors. Both types of anaphors meet Principle A in a, but not in b-d.

Chomsky's theory will account for the ungrammaticality of 19b in terms of the Empty Category Principle (ECP), which requires that a trace must be properly governed; *t* is not properly governed, since *for* is assumed not to be a proper governor. And, it will account for the ungrammaticalities of 19c-d in terms of the Case Filter to the effect that a single function chain must not have more than one Case; the chain (*John*, *t*) has been assigned two Cases. Such treatments are not preferable, not only because they must resort to several distinct principles to account for the distribution of NP-trace, but also because they miss the crucial parallelism between the two types of anaphors illustrated in 19 and 20. Note that lexical anaphors, not being empty categories, are not sensitive to the ECP nor constitute function chains, so their ungrammaticalities in 20b and 20c-d cannot be accounted for by the ECP or the Case Filter.

3.3. PICTURE NOUN ANAPHORS. In §3.1, we have left untouched 'picture noun anaphors', i.e. reflexives or reciprocals appearing in larger NPs together with such nouns as *picture*, *story*, etc. Picture noun anaphors seem to pose a difficulty for the hypothesis that COMP is a SUBJECT. Consider the examples in 21:

- (21) a. We hate it [for pictures of each other to be on sale].
- b. They expected [that pictures of each other would be on sale].

The embedded clause has COMP, and is taken, in our theory, to be the binding category for the anaphors. The anaphors are not bound in the binding category, violating Principle A. Nevertheless, sentences like those in 21 are allegedly grammatical.

The GB-theory of Chomsky 1981 will account for the alleged grammaticality as follows. In 21a, the SUBJECT accessible to the reciprocal is the main AGR, so the main clause is the binding category for the reciprocal. In 21b, the embedded AGR is not a

SUBJECT accessible to the reciprocal, since the assignment of its index to the reciprocal would be excluded by 5ii; instead, the main AGR is the accessible *SUBJECT*, so the main clause is the binding category for the reciprocal. In both sentences, the reciprocal is bound within its binding category, satisfying Principle A; thus, these sentences are grammatical.

The status of sentences like those in 21, however, is not very solid, as Chomsky (1981: 222fn) acknowledges. These sentences are marginal at best, and judgment varies from speaker to speaker (cf. Lasnik and Freiden 1981).

The choice of other picture nouns as the head of NP renders analogous sentences obviously ungrammatical:¹¹

- (22) a. *They expected [that discussion about themselves/each other would take place later].
- b. *John insisted [that there was a letter to himself in Mary's mailbox].

Moreover, the claim that in 21 and 22 the main clause is the binding category, in conjunction with Principle B, would yield the prediction that the anaphors cannot be replaced with pronouns, which are required by Principle B to be free in their binding category. In reality, however, the substitution of pronouns for the anaphors is possible:

- (23) a. We hate it [for pictures of us to be on sale].
- b. They expected [that discussion about them would take place later].

Furthermore, the combination of 7 and 5ii, used to account for the alleged grammaticality of 21, would predict that anaphors can, and pronouns cannot, occur inside an embedded subject constituent which, like the picture NPs in 21, lacks AGR and a subject NP. Contrary to the prediction, however, pronouns can, and ordinary anaphors cannot, occur within an embedded infinitival sentential subject:¹²

- (24) My mother says that [for her/*herself to read so many comic books] is a waste of time.

The facts in 23 and 24 indicate that for the ordinary anaphors and the pronouns, the binding category is the minimal category containing the anaphor or pronoun and COMP, as predicted from our hypothesis and the definition of binding category in 4. Only for the picture

¹¹ From Bach 1977 and Williams 1974.

¹² Koster 1978.

noun anaphors in 21, the binding category does not correspond to the minimal category containing the anaphor and COMP. Hence, our hypothesis is good for ordinary anaphors and pronouns, but not for picture noun anaphors. The linkage of 7 and 5ii assumed in Chomsky's theory, on the other hand, is favorable only for picture noun anaphors, but not for ordinary anaphors or pronouns.

The fact that sentences like 21 are marginal and their grammaticality is lexically governed suggests that these sentences are not core cases, but rather peripheral ones, particularly in the light of the generalization that the status of peripheral cases is marginal, and judgment on them is lexically governed and varies from speaker to speaker (cf. Koster 1978). We are led to conclude, then, that our theory is favorable for core cases, while the linkage of 7 and 5ii is favorable only for peripheral cases.

The peripherality of picture noun anaphors is furthermore suggested by the fact that there are many properties which picture noun anaphors have, but ordinary anaphors do not, or vice versa. A few of the differences between the two groups are demonstrated below:¹³

- (25) a. C-COMMAND CONDITION
- i. A picture of himself irritated John.
 - ii. *Himself irritated John.
- b. PRESENCE OF ANTECEDENT
- i. This is a picture of myself which was taken years ago.
 - ii. *This is myself.
- c. SPECIFIED SUBJECT CONDITION
- i. Tom told Dick Mary's story about himself.
 - ii. *Tom told that Mary loved himself.
- d. ALTERNATION WITH PRONOUN
- i. A picture of himself/him annoyed John.
 - ii. John washed himself/*him.
- e. SPLIT ANTECEDENT
- i. John showed Mary pictures of themselves.
 - ii. *John talked to Mary about themselves.

Of these properties, the first, second, and third ones are particularly noteworthy in relation to Principle A. The adherence to the c-

¹³ E.g. Postal 1971 and 1974, Bach 1977, Koster 1978, and Bouchard 1983. Sentences like 25ci are acceptable in some dialects, but not in all.

command condition and the presence of an antecedent are prerequisites for binding (cf. Chomsky 1981: 184), and the effect of the SSC plays a crucial part in Principle A. The fact that picture noun anaphors are exempt from these properties strongly suggests that they are immune to Principle A, too.

Now that picture noun anaphors fall out of the domain of Principle A, the sentences involving them neither argue for nor against the principle or any notions pertaining to it. The sentences in 21, therefore, are not counterexamples to our hypothesis.

3.4. ONLY SUBJECT NP AND COMP ARE SUBJECTS. Of the two items Chomsky 1981 assumes as *SUBJECT*, *AGR* may be eliminated from a set of *SUBJECT*s, given that *COMP* is a *SUBJECT*. *AGR* plays two distinct roles in determining a binding category. One role is to 'create' a binding category, as in sentences like **John thinks [that himself AGR will win]*. Now that *COMP* is identified as a *SUBJECT*, this role of *AGR* is completely and more adequately taken over by *COMP*. A clause with *AGR* is always a finite clause, and a finite clause always involves *COMP*; therefore, *COMP* creates a binding category wherever *AGR* creates it. Moreover, *COMP* creates a binding category where *AGR* fails to do so, namely, in a *for-to* clause, e.g. 10–11, and 16–18.

The other role *AGR* performs is to 'extend', with the help of 7 and 5ii, a binding category from one clause to another, as in sentences like *They expected [that pictures of each other AGR will be on sale]*. Such an extension of a binding category is necessary only for picture noun anaphors, which we have concluded fall out of the domain of the binding theory. Furthermore, such an extension, it has been proved, yields a counterfactual result regarding ordinary anaphors and pronouns, e.g. 23 and 24.

Thus, the identification of *AGR* as a *SUBJECT* is unnecessary in some cases, insufficient in other cases, and even harmful in still other cases. We, therefore, conclude that *AGR* should be eliminated, and only a subject NP and *COMP* ought to be identified as *SUBJECT*s.

CONCEPTUAL CONSEQUENCES OF THE HYPOTHESIS

4.1. ELIMINATION OF 9. The conclusion stated in the last paragraph of the preceding section yields some conceptually welcome consequences.

First of all, it becomes possible to eliminate the ad hoc stipulation in 9, i.e., that a root *S* is a binding category for a governed element. This stipulation is very special in that though a binding category is generally determined in relation to a SUBJECT, it exceptionally regards a root *S* as a binding category independent of the presence of SUBJECT. The stipulation was motivated by such sentences as 18a:

- (18) a. *[For himself to win] will please John.

Given that COMP is a SUBJECT, however, 9 is not necessary any more: the *for-to* clause is the binding category for the reflexive, within which it is not bound. See §3.1, furthermore, for the advantage of our treatment of 18a along this line over Chomsky's based on the stipulation in 9.

4.2. ONE-TO-ONE CORRESPONDENCE BETWEEN α AND SUBJECT. It also becomes possible to eliminate the redundancy present in the assignment of an accessible SUBJECT to an element in the post-verbal position. Consider 26:

- (26) ... [_S' COMP [_S NP₁ AGR [_{VP} ... NP₂ ...]]]

If the subject NP₁ and AGR were both assumed to be SUBJECTs, either of them might be a SUBJECT accessible to NP₂, since both of them equally c-command NP₂, and are in the sister relationship in *S*. There is no reason for choosing one and rejecting the other. If AGR is excluded from the set of SUBJECTs, on the other hand, the sole SUBJECT accessible to NP₂ in *S* is the subject NP₁; the redundancy now disappears.

Given that COMP is a SUBJECT, furthermore, the subject NP₁ and its accessible SUBJECT is also in a one-to-one correspondence: the sole SUBJECT accessible to NP₁ in *S*' is COMP. Thus, in our theory, the relation between a given element and its accessible SUBJECT is always in a one-to-one correspondence within its binding category.

4.3. ELIMINATION OF 7. The exclusion of AGR from SUBJECTs renders the assumption in 7 unnecessary, at least for the determination of a binding category. The function of 7 is to assign a subject phrase the same index as that of AGR so as to extend a binding category. Now that AGR is eliminated, the assumption germane to AGR should also necessarily be eliminated. Recall, moreover, that 7 was applied to extend a binding category for picture noun anaphors, which we have concluded fall out of the domain of the binding theory.

Both 7, discussed here, and 9, examined in §4.1, are subsidiary devices to determine a binding category. Since they have both proved unnecessary, no subsidiary device need be postulated.

4.4. *NARROWING THE NOTION OF INDEX.* If 7 is eliminated, it also seems possible to get rid of the *i*-within-*i* condition in 5ii from the definition of accessibility in 5, for the configuration of the *i*-within-*i* in most cases is contingent on the application of 7. Cf. 21b, 22, 23b, and 24. There has been, though, one case where the configuration of the *i*-within-*i* arises independent of the application of 7, and the account of which crucially depends on 5ii, namely, example 13a, repeated below as 27:

- (27) [_{S1} John has expected [_{S2} [_{NP1} a review *t*] to come out] for a long time of *Bill's book about French cooking*].

To account for the grammaticality of 27, it must be supposed that NP₁ is not a *SUBJECT* accessible to *t* within it, and the main clause is the binding category for *t*. This is ensured only if 5ii is assumed.

5ii refers to the notion *index*. This notion has been used to indicate two heterogeneous things: (i) to indicate reference of arguments, and (ii) to indicate the fact that some close relation holds between two elements, say, between the pleonastic *there* and a sense subject, or between the pleonastic *it* and an extraposed sentential subject, etc. The former use corresponds to the one in which Chomsky 1981 assigns subscripts, and the latter, to the one in which he assigns superscripts. We call an index in the former use an 'R-index', and an index in the latter use a 'non-R-index'. Indices which AGR and a subject phrase will bear on the assumption of 7 are undoubtedly non-R-indices.

The term *index* in 5ii is intended to cover non-R-index as well as R-index. This is a natural consequence of the assumption of 7, by which an identical non-R-index is assigned to AGR and a subject phrase, and the application of 5ii is to be fed. A non-R-index assigned to AGR and a subject phrase by 7 is the only non-R-index that has relevance to the term *index* in 5ii. Since 7 has been eliminated (cf. §4.3), the non-R-index may be excluded from the coverage of the term of index in 5ii, which will be consequently limited only to R-index. The definition of accessibility, with the notion of index restricted, can be stated as in 28:

- (28) α is accessible to β if and only if (i) β is in the c-command domain of α , and (ii) assignment to β of the *R-index* of α would not violate 6

The narrowing of the index only to R-index as in 28ii is just the restoration to the original spirit of the i-within-i condition. The condition was originally proposed as a semantic well-formedness condition on 'coreference' among arguments to rule out such expressions as $*[_{NP_i} \text{a picture of } [_{NP_i} \text{itself}]]$, where the two NPs indicate the same reference, and the indices they have are necessarily R-indices.

While the i-within-i condition has been made more restrictive, it can, as before, correctly deal with the cases the account of which crucially depends on this condition, e.g. 27: since the index the embedded subject NP bears is an R-index, the assignment of it to the trace t would violate 6; therefore, the embedded subject is not accessible to t .

More important, the new version of the i-within-i condition in 28ii makes a COMP accessible to an element embedded in the NP which is under the domination of the COMP. Cf. 12. A simplified example is presented in 29:

(29) $[_{S'} [_{COMP} [_{NP_i} \text{Which book } t]] \text{ will you read first by Chomsky}]?$
On the assumption of 5ii, COMP would not be accessible to t , since the assignment to t of the index of COMP would violate 5ii. Given 28ii, on the other hand, COMP is accessible to t , because the index the COMP bears is a non-R-index, which is irrelevant to the i-within-i condition in 28ii. The binding category for t is the whole sentence, S' , in which t is bound by the extraposed PP, satisfying Principle A.

4.5. NATURAL GROUPING OF SUBJECTS. The exclusion of AGR from SUBJECTs leaves only a subject and COMP as SUBJECTs. These two items are commonly prominent in the sense that they are least embedded and occupy the left extremity in S or NP, and S' .¹⁴ It is a natural assumption, therefore, that these two are elements which constitute a binding category, i.e. ones which serve to put a boundary between the inside and the outside of such 'propositional' categories

¹⁴ This becomes more evident if it is assumed, along with Jackendoff 1977, that S is analyzed as V^3 , and that S is expanded as COMP plus V^3 . All the SUBJECTs come to commonly occupy the left extremity of $[+ \text{Subject}]^3$:

(i) $[_{V^3} (\text{COMP}) V^3] / [_{V^3} (\text{NP}) V^2] / [_{N^3} (\text{NP}) N^2]$

The point remains the same if S is analyzed as V^4 and NP as N^4 along the lines of Nakajima 1982b and Matsunami *et al.* (1983: 572).

as *S'*, *S*, and *NP*.

CONCLUSION

5.1. SUMMARY. In this paper, we have proposed the hypothesis that *COMP* is a *SUBJECT*. This hypothesis has proved adequate empirically and conceptually. Empirically, the hypothesis has made it possible to describe the distribution of traces of Extraposition and other sorts of anaphors correctly in terms of Principle A. Conceptually, it has made it possible to eliminate *AGR* from a set of *SUBJECTs*, which in turn yields several welcome consequences, such as the elimination of the subsidiary devices for the determination of a binding category as in 7 and 9, the guarantee of a one-to-one correspondence between a given element and its accessible *SUBJECT*, and the natural grouping of the members of *SUBJECT*.

5.2. FURTHER EXTENSION. The hypothesis summarized above opens the way to extend the domain of Principle A further. We sketch it very briefly.

Rightward movements other than Extraposition are also known to obey the Right Roof Constraint (RRC), and cannot move an element out of *that* or *for-to* embedded clauses. Cf. 30a below. This fact can be accounted for along the same lines as those in §2: traces left by rightward movements, i.e. RM-traces to use the term of Nakajima 1982a, are supposed to be anaphors or $\bar{A}$ -anaphors, which are, therefore, subject to Principle A.

Although rightward movements generally obey the RRC, they sometimes violate it. Compare 30a and 30b:

- (30) a. *I have wished [for Bob to find *t*] since 1937 *the treasure said to have been buried on that island*.
 b. I have wanted [to find *t*] since 1937 *the treasure said to have been buried on that island*.

The contrast may be accounted for as follows: in 30b, unlike in 30a, the embedded clause has no *SUBJECT*, so the binding category for *t* expands from the embedded clause to the main clause, in which *t* is bound. In this way, Principle A will be able to explain counterexamples to the RRC as well as its normal examples.

The above account of 30b assumes, without argument, that an empty subject (=PRO) in the embedded *S* does not behave as

SUBJECT.¹⁵ This assumption can possibly be extended further, and it may be assumed more generally that some subject NP or COMP does not, for some reasons, behave as SUBJECT in the binding of certain types of expressions. If this assumption is tenable, Principle A will be able to account for the distribution of another popular kind of trace, i.e. *wh*-trace, as well. For instance, the contrast between 31a and 31b can be handled by Principle A on the assumption that the superficially deletable *that* as well as a subject NP does not act as SUBJECT in the binding of a *wh*-trace:¹⁶

- (31) a. *What did he complain that Mary bought *t*?
 b. What does he believe (that) Mary bought *t*?

Taken together, these brief arguments suggest that the bindings of all three types of traces (i.e. NP-trace, RM-trace, and *wh*-trace), or presumably of all types of bound expressions, are subject to Principle A. And, the choice of SUBJECT is supposed to be parameterized depending on the types of bound expressions. For instance, in the binding of RM-trace, an empty subject is not chosen as SUBJECT (cf. note 15); in the binding of *wh*-trace, a subject and an empty COMP (provided that a deletable *that* is absent in the syntactic component, and is inserted in PF) are not chosen as SUBJECT; in the binding of A-anaphors, a subject and COMP are chosen as SUBJECT. These values of the parameter may be determined on some reasonable grounds. The consideration along this line leads us to the conclusion that Principle A is relevant to all the bound expressions, and the local nature of the bound expressions stems from this principle; therefore, no particular

¹⁵ Note that 30b becomes ungrammatical if a lexical NP is provided in the subject position of the embedded S.

RM-trace is, according to Nakajima 1982a, a bound expression subject to $\bar{A} \cdot \bar{O}$ binding. Another bound expression of the same type is presumably a trace left by VP Preposing, which is distinct from a *wh*-trace. The binding of this trace is also sensitive to the presence or absence of an embedded lexical subject (cf. Culicover and Wilkins 1984):

- (i) a. Everyone suspects that you would want to leave early, and *leave early* you want [to *t*].
 b. *Everyone suspects that Sam would want Jim to leave early, and *leave early* he wants [him to *t*].

Then, it is assumed that $\bar{A} \cdot \bar{O}$ bound anaphors 'see' a lexical subject, but not an empty subject, as a SUBJECT.

¹⁶ Interestingly enough, there is a correlation between so-called bridge verbs and verbs whose finite clause complement need not have the complementizer *that*. Cf. Erteschik 1973.

locality condition, such as the Subjacency Condition, need be imposed on movement.

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