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Reflexivity

At earlier stages of the theory of government and binding (Chomsky 1981), the binding theory was also believed to govern certain aspects of the restrictions on movement, most notably those on NP-movement. However, since the "barriers" stage (Chomsky 1986a), the move has been toward once again separating the binding and movement modules, the latter falling under chain theory.

Conditions A and B of the binding theory have essentially remained as first stated in Chomsky 1981 (with their conceptual roots in Chomsky 1973, and the idea that c-command is the relevant structural relation going back to Reinhart 1976).¹ But now they govern only anaphora. Given this development, it is appropriate to check how well the binding theory in fact captures the distribution of pronouns and anaphors.²

We argue that the many empirical problems with the current binding theory justify a revision of the most basic assumptions concerning what Conditions A and B are about. In some sense, what we propose is a return to a more traditional view of anaphora, by which both Conditions A and B govern the well-formedness and the interpretation of reflexive predicates in natural language.³

On the other hand, we argue that the marriage of the binding and movement modules was not just a historical accident. The two do meet, but perhaps in a different way than

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¹ In fact, many of the empirical problems with the c-command approach with regard to the current Condition A were already known in the seventies. For this reason, the requirement that an anaphor be c-commanded by its antecedent, which was proposed in Reinhart 1975, was not included in Reinhart 1976.

² We take the binding theory to consist only of Conditions A and B, and to govern only bound variable anaphora. Condition C and other coreference effects are argued in Reinhart 1983a to belong to a different, inferential, module. This position is further developed and defended in Grodzinsky and Reinhart 1993.

³ In traditional linguistics, a much closer relation between anaphora and argument structure (*avant la lettre*) was assumed. Reflexivization was analyzed as a property of predicates. A typical statement is that a reflexive pronoun is used in the object position (to avoid "repetition of the subject") when the verb expresses a reflexive relation (e.g., Jespersen 1933, Gleason 1965). That is, the heart of the phenomenon is taken to reside in the nature of the relation expressed by the verb. Partee and Bach (1981:fn. 7) attribute a similar idea to Montague. They pursue this line briefly, though they do not actually incorporate it into their anaphora rules. (See also footnote 8.)

previously assumed: some aspects of local anaphora, which have always been viewed as falling under the binding conditions, are in fact just a subcase of the theory of chains. Distinguishing binding theory effects from chain effects allows the binding conditions also to work correctly in languages other than English.

1 Anaphoric Expressions

The standard division of lexical anaphoric expressions is into pronouns and anaphors. Anaphors fall into two types: those that are standardly referred to as long-distance anaphors (Dutch *zich*, Norwegian *seg*, Italian *sè*, etc.) and those that are viewed as local (English *himself*, Dutch *zichzelf*, Norwegian *seg selv*, etc.). As observed by Faltz (1977) and Pica (1985, 1987), when anaphors are complex expressions, they are universally local, whereas the long-distance type is universally simplex. We will refer to the latter as *SE* (simplex expression) and to the former as *SELF anaphors*.⁴

In terms of internal structure, *SE* anaphors and pronouns form one group, distinguished from *SELF* anaphors. In accordance with Postal (1970), Vergnaud (1987), and others, we will assume that pronouns are in determiner position. Yet they project as full NPs, as in (1).

- (1) [NP Pron [N' . . . e . . .]]

SE anaphors are structurally identical to pronouns, as in (2).

- (2) [NP SE [N' . . . e . . .]]

But they differ from pronouns in that they lack a full specification of φ-features (number, gender, person; see Chomsky 1981 and Bouchard 1984). Although they may preserve person features in many languages, they always lack number and gender features. Hence, they do not project an argument that can be interpreted independently.⁵ We take the lack of φ-features to be the property responsible for their anaphoric nature. In the case of *SELF* anaphors, *SELF* is an N, rather than a determiner, and it combines with a pronoun determiner or a *SE* determiner, as in (3).

- (3) [NP Pron/SE [N' self]]

We assume a definition of anaphors along the lines of those in Chomsky 1986b and Keenan 1987: Anaphors (of both the *SE* and the *SELF* type) are referentially defective NPs, which entails, for example, that they cannot be used as demonstratives, referring to some entity in the world (though it does not entail that they must be bound variables). Binding may be viewed as the procedures assigning the content necessary for their referential interpretation.

However, the two types of anaphors differ substantially in their grammatical functions. *SELF* anaphors function as reflexivizers. This function is carried by the *SELF-N*, whose semantics we take here to be a restriction imposing identity on two arguments of a predicate, one of which is the pronoun determiner embedded in the *SELF* anaphor. (The alternative is to view *SELF* as an operator turning a transitive predicate into an intransitive one, as in Keenan 1987).⁶ *SE* anaphors lack this function altogether.

Combining the last two properties, we obtain the following typology of anaphoric expressions:

(4)	SELF	SE	Pronoun
Reflexivizing function	+	-	-
R(referential independence)	-	-	+

The property R (referential independence) is essentially the one assumed in the GB framework (e.g., Chomsky 1981) for R-expressions, except that we place pronouns too under this roof, as +R. (We will discuss this property in more detail in section 6.) A major claim of this article will be that each of the properties in (4) is governed, in fact, by a different module of linguistic knowledge, which together capture the full distribution of local anaphora: only the reflexivizing function of anaphoric expressions is relevant for (our modified) binding conditions, whereas all aspects of their distribution that are sensitive to the R property fall, together with NP-movement, under chain theory.

As seen in (4), *SELF* and *SE* anaphors form one group with respect to the R property, as referentially deficient (-R) expressions. But *SE* anaphors also form a group with pronouns. As argued by Everaert (1986, 1991), their similarity to pronouns in internal structure (which we observed in (1) and (2)) correlates with a similarity in grammatical function. Put in our terms: both lack the reflexivizing function, and function just like arguments. However, because *SE* anaphors lack φ-features, some operation is needed to allow them to serve as arguments. In Reinhart and Reuland 1989 and 1991, we capture this by letting them adjoin to I (Agr), where they inherit the subject's features. It is their trace, then, that serves as the argument, inheriting the φ-features of the SE-I complex. As is well known, these anaphors, unlike the *SELF* type, are subject-oriented (can be bound only by a subject), which now follows directly from the fact that they are interpreted via an association to I. Following Everaert's insight, then, *SE* anaphors should be viewed as pronominal anaphors, as he defines them, though we may at times keep referring to them as just *SE* anaphors, for brevity. It should therefore not be surprising to find out that (in most studied languages) they pattern with pronouns with respect to Condition B.

Both types of anaphors also allow (discourse) uses known as logophoric (which we survey briefly in section 3.2). In Reinhart and Reuland 1989 and 1991, we argue that the

⁴ In addition, many languages have possessive anaphors. Discussion of their properties is beyond the scope of the present article.

⁵ See Bouchard 1984 for discussion of the connection between φ-features and interpretability.

⁶ At the moment we cannot take this line, since, as we will argue, Condition A is defined over syntactic predicates, so the arguments identified by *SELF* need not be semantic arguments of a predicate. In certain cases, then, a syntactically reflexive predicate does not correspond to a semantically intransitive predicate.

failure to distinguish between the grammatical and logophoric functions in the syntactic research on anaphora has led to many misconceptions concerning the syntactic distribution of anaphors. Specifically, the terms *local anaphor* and *long-distance anaphor* are highly misleading. Both kinds of anaphor can occur at all kinds of distances when they are used logophorically. If we focus on the grammatical function of anaphors, the domains of anaphor occurrence can be reduced (possibly universally) to just two. The first (corresponding to the "local" domain) is the domain of reflexivity, where a SELF anaphor obligatorily reflexivizes a predicate, and where both pronouns and the SE-pronominal anaphors are excluded. This is the domain regulated by Conditions A and B, as we restate them. The second is the domain allowing SE anaphors to be bound (though not excluding pronouns). Despite the apparently massive differences reported among languages, we argue there that this too is reducible to a unique domain. In traditional terms, this binding obeys the Tensed-S Constraint; that is, it is impossible across tense. We show that this follows from the fact that SE anaphors must move to I to acquire ϕ -features. The full distribution of SE anaphors, then, falls under movement theory, rather than just under the binding theory. With respect to the binding theory, they pattern with pronouns, obeying Condition B. In this article we focus on the domain of reflexivity, that is, on the binding theory.

We will not discuss reciprocal anaphors here. Their syntactic distribution appears identical to the distribution we define for SELF anaphors. However, we leave open the relations between reflexive and reciprocity marking, and further aspects of their interpretation.⁷

2 Condition B

2.1 Problems with the Standard Condition B

The standard formulation of the binding conditions (in (5)) entails strict complementarity between pronouns and anaphors, since the conditions are the precise mirror image of each other.

(5) Condition A

An anaphor is bound in its governing category.

Condition B

A pronoun is free in its governing category.

⁷ In previous work (Reinhart and Reuland 1989, 1991) we assumed that reciprocals do not allow a logophoric usage; hence, they have a different distribution than reflexive anaphors, and they should be governed by a different mechanism. However, Pollard and Sag (1992) argue convincingly that this is not true. Further examples are the following (from John Frampton and Daniel Fox (personal communication)), where the antecedent does not c-command the anaphor, which is a characteristic property of logophoric anaphora:

(i) John and Mary's houses appealed to each other's taste.

(ii) The arguments that John and Mary presented were the basis for each other's articles.

In any case, it seems that reciprocals are subject to additional constraints, required for their interpretation, and we assume on that the analysis proposed by Heim, Lasnik, and May (1991).

Although this is indeed true in many contexts, such as those of (6), and a pronoun is disallowed in an environment allowing an anaphor, it is well known that there are contexts where complementarity breaks down, most notably with adjuncts and NP anaphora: in (7) and (8) both a pronoun and an anaphor can occur, in apparent violation of (at least one of) the conditions in (5).

- (6) a. Max criticized himself/*him.
- b. Max speaks with himself/*him.
- c. Lucie's joke about herself/*her
- (7) a. Max saw a gun near himself/him.
- b. Lucie counted five tourists in the room apart from herself/her.
- (8) a. Lucie saw a picture of herself/her.
- b. Max likes jokes about himself/him.

(Although Chomsky (1986b) proposes an account for the NP contexts of (8), it does not explain the contexts in (7).) The sentences in (6)–(8) differ in their argument structure. Whereas in (6) the anaphor and its antecedent are coarguments, in (7) and (8) they are not: in (8) the anaphor is embedded in an argument, and in (7) it is in an adjunct PP, or in any case, it cannot be itself viewed as an argument required by the verb's grid (a point we expand on directly). Leaving exceptional Case-marking (ECM) subjects aside for the moment, the generalization is that pronouns are disallowed only when the pronoun and its antecedent are coarguments. That this might be the correct generalization was observed by Partee and Bach (1981) and independently defended by Farmer (1984) and Farmer and Harnish (1987).⁸

The environments where a pronoun must be free are thus much more restricted than the environments where an anaphor can be bound. Furthermore, they do not appear to vary with languages. In languages allowing anaphors to be long-distance bound, pronouns are still excluded only in the same local coargument contexts as in English. For example, in the (long-distance) context of (9) in Dutch a pronoun is not excluded, but in the coargument case of (10) it is. (See Reuland and Koster 1991 for an overview of this fact across languages.)⁹

- (9) Jan zag [jou achter zich/hem staan].
Jan saw [you behind SE/him stand]
'Jan saw you stand behind SE/him.'
- (10) Jan haat zichzelf/*hem.
Jan hates himself/*him

The empirical coverage of the binding theory will therefore be significantly improved if

⁸ According to Partee and Bach, the idea is that "two variables within the same 'local context' [roughly, coarguments of a verb or other predicate] cannot have the same index" (p. 104). The actual implementation they propose for the equivalent of Condition B indeed allows a pronoun to be bound in the picture-NP contexts of (8), but it does not give the right result for the adjunct cases of (7). (See also Bach and Partee 1980.)

⁹ Note that Icelandic is an exception to this generalization (see the literature cited in Reuland and Koster 1991).

we start by restating Condition B. However, a somewhat more radical shift is needed concerning what this condition is about. Whereas both Bach and Partee (1980) and the standard GB binding theory view it as a condition on the distribution of pronouns, we argue that it is in fact a condition on reflexive predicates.

2.2 Reflexive Predicates

We define a predicate as reflexive iff (at least) two of its arguments are coindexed (see (11a)). Note, first, that if the pronouns in (6) were permitted to be bound, the resulting predicates would be reflexive, just like their counterparts with an anaphor, since two arguments of each predicate end up identical. A universal property of natural language seems to be that reflexivity must be licensed. A predicate (formed of N, V, etc.) can be reflexive only if it is linguistically marked as reflexive. The two available ways of reflexive marking across languages are marking the predicate's head (for example, a verb) or marking one of the arguments. In the languages we are examining here, this corresponds to intrinsic and extrinsic reflexivization. In intrinsically reflexive predicates, the heads (verbs) are marked as such in the lexicon, with or without an overt morphological marking of the verb. Reflexivization is viewed, in these cases, as an operation on the verb's θ-grid, absorbing one of its θ-roles (see, for example, Keenan 1987 and Chierchia 1989). Such verbs can be used only reflexively, and languages vary on whether the absorbed role is nevertheless realized in the overt syntax (as is obligatory in Dutch) or not (as seems permitted in English). A transitive predicate that is not intrinsically reflexive may turn into a reflexive predicate if reflexivity is marked on one of its arguments, with a SELF anaphor. We argue, then, that Condition B is simply the requirement that a predicate can be reflexive only if it is reflexive-marked.

Before proceeding to formulate this condition, we should note that natural language predicates may have more than just two arguments. In the very common case of a three-place predicate (with a dative argument), any two of the arguments, or all three, may be coindexed. Each of these coindexation options forms a reflexive predicate, the way we use the term. It is, then, an empirical question whether reflexivization is a pair relation, with each coindexed pair requiring its own marking, or whether one reflexive marker can license the coindexation of more than two arguments. The evidence we have so far suggests the second view, at least when reflexivization is marked on the argument, with a SELF anaphor (illustrated in (21)). (When the predicate is intrinsically reflexive, which arguments are identified is predetermined on its thematic grid.) Our definitions below are therefore formulated so as to allow this option.

(11) Definitions

- A predicate is *i-reflexive* iff (at least) two of its arguments are *i-coindexed* (that is, are indexed *i*).
- A predicate (formed of P) is *i-reflexive-marked* iff either P is lexically reflexive with respect to an *i*-indexed argument, or one of P's *i*-indexed arguments is a SELF anaphor.

(12) Condition B

An *i*-reflexive predicate is *i*-reflexive-marked.

As is standard, Condition B should be read as a conditional, equivalent to: If a predicate is *i*-reflexive, it is *i*-reflexive-marked. Given these definitions, Condition B entails that coarguments of a predicate that is not intrinsically reflexive can be coindexed only if one of the coindexed arguments is a SELF anaphor. The condition is relativized to an index to guarantee that a given SELF anaphor, indexed *j*, would not count as licensing the coindexation of two arguments with a different index, *i*. (This could be the case, for example, in *Max₁ showed myself₂ to him₁, as pointed out by Arild Hestvik (personal communication) and Fox (1993).) For ease of presentation, we will use an abbreviated terminology throughout (unless there is a potential unclarity regarding which indices are involved). The abbreviated version of (11)–(12) is given below. Though for the examples we discuss in this article this simplified statement is sufficient, it should be kept in mind that the intuition intended by it is stated formally only as above.

(11') Definitions

- A predicate is *reflexive* iff two of its arguments are coindexed.
- A predicate (formed of P) is *reflexive-marked* iff either P is lexically reflexive or one of P's arguments is a SELF anaphor.

(12') Condition B

A reflexive predicate is reflexive-marked.

Let us now look at how this condition works in the examples we have been discussing.

In the case of (6a) (repeated in (13)), (12) is equivalent to the standard Condition B: in both (13a) and (13b) binding yields a reflexive predicate, so Condition B requires reflexive marking. Whereas (13b) is appropriately marked, the unmarked (13a) is filtered out. We may note that Condition B also captures cases left for Condition C in the standard binding theory. For (12), there is no difference between (13a) and (13c), and binding is ruled out in both, for the same reason.

- *Max₁ criticized him₁.
- Max₁ criticized himself₁.
- *Max_{1/he} criticized Max₁.

But in the NP cases, like (8b), repeated in (14), the pronoun is an argument of the predicate *jokes*, whereas its antecedent is an argument of the matrix verb. In this case, then, binding (illustrated in (14b)) does not yield a reflexive predicate, and therefore Condition B of (12) does not rule out anaphora here.

- Max₁ likes jokes about him₁.
- Max₁ (λx (like (x, jokes about x)))

Similarly, in the case of clear-cut adjuncts, like *apart from her* in (7b), no reflexive predicate is formed, since the pronoun and its antecedent are not coarguments, so Con-

dition B is met. But let us look in more detail at the difference between the two types of PPs (which were illustrated already in (6b) and (7a), repeated here as (15a) and (16a)).¹⁰

- (15) a. *Max₁ speaks with him₁.
- b. *Max₁ relies on him₁.
- (16) a. Max₁ saw a gun near him₁.
- b. Max₁ put the gun near/under/on him₁.
- c. Max₁ sat Lucie next to him₁.

As noted, when the pronoun and the antecedent are thematic arguments, as in (15), Condition B applies to rule out the unmarked reflexive predicate; but with locative and directional PPs, as in (16), the P complement shows no Condition B effects. Whereas in the case of (16a) it is common to characterize the PP as an adjunct, in (16b–c) this is less obvious, since these PPs are selected by the verb. However, Marantz (1984) has shown that locative PPs, including the selected ones, must be distinguished from the PPs in (15), as well as from instrumental PPs. In (16b–c) the verb selects only a location, which means that the whole PP, rather than the NP in it, carries the thematic role of the verb.¹¹ One indication that a direct (semantic) relation is lacking between the P complement and the verb in such cases is, as Marantz points out (1984:31), that verbs selecting the locative role allow all locative prepositions, as illustrated in (16b), whereas in (15) the verb can select its argument only via one specific preposition. In (15), then, there is no P predicate, and the P complement is just an argument of the verb. In locative PPs, like those in (16), P forms its own predicate. We may add that in the case of locatives there appears to be a PP-internal thematic structure. For example, whereas *in* selects an argument with the semantic relation of a container, *around* selects something that is contained. Another way to state Marantz's generalization is that in (15) the preposition and the verb necessarily form a complex thematic unit selecting the NP, which is not true for the verbs of (16), though they may still allow this as an optional lexical operation. (See also Baker 1988 and Hestvik 1991 for evidence supporting the noncoargument status of the NPs in locative PPs.)

Under this analysis, then, it does not crucially matter whether the PP itself is considered an adjunct. Whenever the preposition forms its own predicate, as in (16), the NP in the PP is not, itself, an argument of the verb. Coindexing a pronoun in this position with an argument of the verb therefore does not yield a reflexive predicate, given the definition in (11a) (since these two are not coarguments). Hence, Condition B is not violated. In section 5.3 we will return to further aspects of the way Condition B works in PPs. Discussion of ECM subjects will be deferred to sections 6 and 7.

Viewing Condition B as a condition on the linguistic marking of reflexivization entails yet another departure from the standard assumptions on binding: our Condition

¹⁰ We thank Jane Grimshaw and Tom Roeper for helping us to understand the following cases.

¹¹ Whereas in the case of argument PPs, as in (15), it is also true that the P selects its complement NP; in Marantz's system, that NP is still defined as carrying the semantic role of the verb, and the P can be viewed as the mediator. This view is further developed by Pesetsky (1992).

B, like its twin Condition A that we will introduce shortly, makes no use of configurational relations like binding, c-command, or even argument hierarchy. It is strictly a condition on reflexive predicates, regardless of their internal structure. This condition alone therefore equally allows both *She praised herself* and **Herself praised her*. We consider how these two are distinguished, and other aspects of the configurational issue, in section 8.

2.3 Condition B with SE-Pronominal Anaphors

So far we exemplified the operation of our modified Condition B with the distribution of pronouns, which is believed to be the core issue of the standard Condition B. However, as we proceed, it will turn out (in section 6) that the task of ruling out inappropriate pronominal anaphora is divided between two linguistic modules. Though there are many contexts of pronominal anaphora that are governed only by Condition B (and to which we return), in the specific examples discussed in this section, anaphora happens to be ruled out also independently of Condition B, by a general condition on coindexing chains (to be discussed in detail in section 6). To check the precise scope of Condition B, we should turn to the SE-pronominal anaphors, which provide the most direct support for our claim that Condition B governs reflexive predicates, rather than the distribution of pronouns.

As noted earlier, though referentially deficient (–R), these anaphors are not reflexivizers—occurring on an argument position of a predicate, they do not reflexivize it. With respect to Condition B, they therefore function in many languages exactly like pronouns. In the Dutch (17a–b) and the Norwegian (18a–b) Condition B rules out such anaphors exactly as before, since the reflexive predicates are not licensed. However, in the locative cases (17c) and (18c), where no reflexive predicate is formed, SE anaphors are allowed.¹²

- (17) a. *Max haat zich.
 Max hates SE
- b. *Max praat met zich.
 Max speaks with SE
- c. Max legt het boek achter zich.
 Max puts the book behind SE

¹² Jan Koster (personal communication) points out to us that in adjunct constructions such as (i) a reflexive is required (see also Koster 1985).

(i) Jan sprak namens zichzelf.
 Jan spoke on behalf of himself

Regardless of whether *namens* is analyzed as a P or an N (the latter being more in accordance with its historical origin), such cases are captured by our analysis of P and N predicates in section 5. According to that analysis, *namens* forms a semantic predicate (though not a syntactic one). One of its arguments is *zichzelf*, the other is controlled by *Jan*. Hence, the adjunct in (i) is a reflexive predicate by itself and therefore must be reflexive-marked.

- (18) a. *Jon foraktet seg. (Hellan 1988:chap. 3, (13b))
 Jon despised SE
 b. *Jon snakket med seg.
 Jon talked with SE
 c. Jon legger boken bak seg. (based on Hellan 1988:chap. 3, (61))
 Jon puts the book behind SE

Everaert (1986, 1991) has noted a contrast that constitutes a real challenge to the standard binding theory. Unlike (17a), where *zich* is excluded, the apparently identical structures in (19a–b) allow or even require it. Hellan (1988) found the same to be true for the Norwegian equivalents in (19c–d).

- (19) a. Max wäst zich.
 Max washes SE
 b. Max schaamt zich.
 Max shames SE
 'Max is ashamed.'
 c. Jon wasket seg. (Hellan 1988:chap. 3, (22a))
 Jon washed SE
 d. Jon skammer seg. (Hellan 1988:chap. 3, (9c))
 Jon shames SE

Everaert shows that this correlates with differences in the inherent properties of the verbs. A verb like *schamen* 'shame' is intrinsically reflexive, as witnessed by the fact that it cannot take any object distinct in reference from the subject. Verbs like *wassen* 'wash', which do allow a distinct object, are listed twice in the lexicon, both as reflexive and as nonreflexive; their reflexive entry allows the SE anaphor, and their transitive entry occurs with a SELF anaphor. The verbs of (17a) and (18a) do not have an intrinsic reflexive entry at all.¹³ The same distinction among these verbs is found in many languages,¹⁴ though, as observed by Zubizarreta (1987), languages differ in whether they allow, require, or forbid the patient role of their intrinsically reflexive verbs to be realized syntactically, as in (19).

The contrast between (17a–b)–(18a–b) and (19), then, follows directly from the way

¹³ Independent support for this claim comes from the interpretation of nominalizations. When subject and object arguments are omitted, *wassen* 'wash' readily admits a reflexive interpretation, whereas *hatten* 'hate' does not. This is illustrated by the contrast between (ia) and (ib).

- (i) a. Wassen is gezond.
 washing (oneself) is healthy
 b. Hatten is niet gezond.
 hating (only someone else) is unhealthy

¹⁴ In English the equivalent of *zich schamen* has been replaced by an intransitive form (*be ashamed*), whereas *wash* is still ambiguous between the transitive entry and the intrinsic reflexive one (as in *she washes*). In Hebrew intrinsic reflexives are coded morphologically with a special verb form ('hitpa'el'). *Shame* occurs only in that form; *wash* has both that form and a transitive form; *hate* and *despise* of (17) and (18) do not allow that form at all.

we have stated Condition B. By definition (11b), the predicates in the latter, unlike the former, are reflexive-marked, since the verb—P—is lexically reflexive. Condition B is therefore met: the predicates in (19) are semantically reflexive, but they are, as required, reflexive-marked.¹⁵ It would appear that pronouns too should be allowed in such contexts, but this is not true for Dutch and Norwegian; their appearance is blocked independently of Condition B (by the Chain Condition, in a way we discuss in section 6).

An intrinsic/nonintrinsic reflexive contrast also shows up on the dative argument of three-place predicates. This is illustrated by the following contrast in German (from Truckenbrodt 1992). (The same contrast is found in the Dutch counterparts of these examples.) In the standard dative case a SE anaphor is excluded, as in (20b), and a SELF anaphor is required, as in (20c). However, in (20a) the verb is intrinsically reflexive with respect to its dative argument. So Condition B is, correctly, met in this case.

- (20) a. Peter stellte sich die Statue vor. (G)
 Peter stelde zich het standbeeld voor. (D)
 Peter imagined himself the statue PRT
 NOM (+intr.refl.) DAT ACC
 'Peter imagined the statue.'
 b. *Peter vertraute sich seine Tochter an.
 *Peter vertrouwde zich zijn dochter toe.
 Peter entrusted to-himself his daughter PRT
 NOM (-intr.refl.) DAT ACC
 c. Peter vertraute seine Tochter nur sichselbst an.
 Peter vertrouwde zijn dochter slechts zichzelf toe.
 Peter entrusted his daughter only to-himself PRT
 NOM (-intr.refl.) ACC DAT

The same contrast between intrinsic and nonintrinsic reflexives in Icelandic is observed by Sigurjónsdóttir (1992) and Sigurjónsdóttir and Hyams (to appear), who discuss it from an acquisitional perspective.¹⁶

¹⁵ A different question is why intrinsically reflexive verbs favor a SE anaphor over a SELF one. This does not follow directly from anything we say, but we believe that it follows from principles of economy: the same property should not be marked twice. Vacuous application of a morphological process is generally prohibited (for instance, one does not find a combination of two passivization processes on one lexical item). Indeed, SELF anaphors are not completely excluded here, but require discourse justification.

¹⁶ Although traditional anaphors in German behave as predicted by the theory, accusative anaphors in German do not exhibit the expected contrast; the accusative simplex anaphor *sich* can occur in reflexive predicates independently of the intrinsic reflexive contexts we discussed. The same appears to be true of *ziji* in Chinese. At the moment we do not have an account for such cases, nor do we know how widely this pattern occurs. Note, however, that proper assessment of the facts often depends on more detailed investigation of the languages involved. For instance, Maling (1982) notes that the contrast between *sig* and *síðlfan sig* in Icelandic is "not grammaticalized" (suggesting that *sig* may occur more freely than one would expect), whereas according to Hellan (1988), it follows the same pattern as in Norwegian (which is in full accordance with our Condition B). This agrees with the findings of Sigurjónsdóttir (1992) and Sigurjónsdóttir and Hyams (to appear). Furthermore, it is quite possible that the simplex-complex dichotomy must be understood in a somewhat different way. For instance, unlike Dutch *zich*, German *sich* may bear stress. In this, *sich* behaves like the head of a

Now let us examine standard three-place predicates. In (21a) two of the arguments are coindexed, and since there is no reflexive marking, the sentence is ruled out by Condition B, in the same way that (17b) and (20b) were. However, in (21b) (observed by Martin Everaert (personal communication)), another coindexed argument of the predicate is a SELF anaphor, which therefore reflexive-marks the predicate. The predicate is 1-reflexive (with three arguments indexed 1), but as required by Condition B, it is also 1-reflexive-marked. (See the definitions in (11)–(12).) Hence, one reflexive marker is sufficient to license the reflexivization of more than two arguments. In fact, choosing one marker is preferred here over the option of marking two arguments, as in (21e), for the reasons mentioned in footnote 15. As predicted, it does not matter which of the internal arguments is SELF-marked—(21b,d) illustrate the same point with a different placement of the SE argument. (As in the case of (19), a pronoun cannot replace *zich* in any of these examples for independent reasons.)

- (21) a. **Henk, wees mij aan zich, toe.*
Henk assigned me to SE
- b. *Henk, wees zichzelf, aan zich, toe.*
Henk assigned himself to SE
- c. **Henk, wees zich, aan mij toe.*
Henk assigned SE to me
- d. *Henk, wees zich, aan zichzelf, toe.*
Henk assigned SE to himself
- e. ?*Henk, wees zichzelf, aan zichzelf, toe.*
Henk assigned himself to himself

Given the facts in (17)–(21), it would be extremely difficult to view Condition B as a condition on specific lexical items (pronouns, or SE anaphors), since it is sensitive to both anaphor types and predicate types. The universal generalization shared by all the cases discussed above is the one we argued for: that reflexivization must be licensed either in the syntax or in the lexicon. Condition B, as we stated it, checks the reflexive marking of predicates, and not just the properties of their arguments.

Note, finally, that if Condition B applies to predicates, it cannot rule out any co-indexation of NPs that are not coarguments. Thus, another area where this view of Condition B differs empirically from the standard one is in ECM and small clause structures. As we will show in section 7 in discussing the contrast between cases such as *Henk, hoorde [zich, zingen]* 'Henk heard [SE sing]' and **Henk, overreedde zich, [PRO,*

noun phrase, just like Dutch *zelf* (and unlike *zich*). Suppose now that, universally, a SELF anaphor is an anaphor in the head position of an NP (and a SE anaphor is an anaphor in determiner position). If the anaphor is in head position, and the determiner position is filled, the whole expression is overtly characterized as a SELF anaphor. However, under conditions where a language allows the determiner to be empty (and such conditions might involve the type of Case the anaphor carries), SE anaphors and SELF anaphors may come out homophonous, perhaps only differentiated by stress (see Reinhart and Reuland 1991 for a discussion of Polish *siebie* that is in line with this perspective).

te zingen] 'Henk persuaded SE [PRO to sing]' (example (109)), it is indeed true that a SE anaphor can be bound by the matrix subject when it is in the subject position of the complement but not when it is a θ-argument of the matrix predicate.

This sheds a new light on the ongoing controversy regarding the syntax of ECM versus object control structures. Though in the syntactic framework we are assuming the two differ structurally, there has never before been any direct empirical evidence for that distinction, since as far as pronouns and SELF anaphors are concerned, they behave the same way. But focusing on SE anaphors, we find a sharp contrast between the ECM case and the object control case. Our reformulation of Condition B also provides the tools to explain this contrast: in the control case, unlike the ECM case, coindexation yields a reflexive predicate. We return to this distinction in section 7.2, and, again, we postpone the question of why pronouns are not allowed as well in the ECM case until section 6.

3 Condition A

3.1 The Condition

Although replacing Condition B eliminates the complementarity problem of the current binding theory, Condition A still carries its own (less widely acknowledged) problems. The most serious question is whether it is indeed true that an anaphor cannot occur free, as entailed by Condition A. Already in the early seventies, it was noted by Ross (1970), followed by Cantrall (1974) and Kuno (see, for a summary, Kuno 1987, and for a more recent discussion, Zribi-Hertz 1989), that first and second person SELF anaphors can occur in English without a sentential antecedent, in blatant violation of (what is now known as) Condition A, as in the (a) sentences of (22)–(24). Dutch SELF anaphors are allowed in essentially the same environments, as illustrated with the translations of (22a–b) in (22c–d).

- (22) a. There were five tourists in the room apart from myself.
- b. *Five tourists talked to myself in the room.
- c. Er waren vijf toeristen in de kamer behalve mezelf.
- d. *Vijf toeristen praatten met mezelf in de kamer.
- (23) a. Physicists like yourself are a godsend. (Ross 1970)
- b. *A famous physicist has just looked for yourself.
- (24) a. "She gave both Brenda and myself a dirty look." (actual discourse, quoted in Zribi-Hertz 1989)
- b. *She gave myself a dirty look.

These facts cannot simply be dismissed as reflecting some peculiar discourse properties, or as indicating that first person anaphors can be used deictically. Normally, first person reflexives behave strictly like anaphors. For example, in the (b) cases of (22)–(24) they are ruled out, correctly, by Condition A. Why, then, does Condition A fail precisely in the (a) cases? Furthermore, the problem is not restricted to first person

reflexives. As was noted by the same scholars in the seventies, third person reflexives can be long-distance bound in English, in violation of Condition A. This use (known as *logophoric*), which is assumed to interact with point of view, is most common in narrative texts, and Zribi-Hertz (1989) provides about 130 examples from actual texts, two of which are quoted in (25a) and (25c).

- (25) a. "It angered him that she . . . tried to attract a man like himself."
- b. *It angered him that she tried to attract himself.
- c. "Clara found time to check that apart from herself there was a man from the BBC."
- (26) a. Max boasted that the queen invited Lucie and himself for a drink.
- b. *Max boasted that the queen invited himself for a drink.

The syntactic contexts allowing this use are the same as before. Here again, Condition A equally blocks anaphora in both the (a) and the (b) cases (and in (25c)). Since this is correct for the (b) cases (though wrong for the others), we cannot simply conclude, as often done in the earlier studies mentioned above, that point-of-view contexts allow (somehow) for violations of Condition A.

The question is, therefore, What is the property distinguishing the (a) and the (b) cases in all the examples (22)–(26)? In fact, we already have the answer at our disposal. Let us look again at the definition of reflexive marking in (11a), the abbreviated version of which is repeated here.

(11') Definitions

- a. A predicate is *reflexive* iff two of its arguments are coindexed.
- b. A predicate (formed of P) is *reflexive-marked* iff either P is lexically reflexive or one of P's arguments is a SELF anaphor.

(12') Condition B

A reflexive predicate is reflexive-marked.

In the (b) cases, the free SELF anaphor is an argument of its predicate. This means that one of the arguments is SELF-marked, and hence, the predicate is defined as reflexive-marked. The (a) cases, by contrast, involve no reflexive-marked predicates. For example, in (26b) one argument of *invite* is SELF-marked; hence, its predicate, *the queen invited himself*, is reflexive-marked. In (26a) the anaphor is embedded in an argument. The argument of *invite* is *Lucie and himself*, which is not, itself, a SELF anaphor. Hence, *the queen invited Lucie and himself* is not reflexive-marked. The same holds for (23a), (24a), and (25a). In (22a) and (25c) the anaphor occurs in an adjunct position, so no argument of the verb is a SELF anaphor and no reflexive-marked predicate is formed.

Suppose, now, that Condition A, just like Condition B, is in fact about reflexivization, rather than about anaphors: it requires that reflexive marking be interpreted reflexively, but it does not say anything about anaphors not functioning as reflexive markers. Let us state this as our first approximation of Condition A, (12''), which will be slightly modified directly.

(12'') Condition A

A reflexive-marked predicate is reflexive.

(Just like Condition B, Condition A should be read as a conditional, equivalent to: If a predicate is reflexive-marked, it is reflexive.)

In the basic case of, for example, (13b)—*Max criticized himself*—the anaphor is an argument of *criticize*; hence, by (11b), this predicate is reflexive-marked. Condition A of (12'') therefore requires that this predicate be reflexive. This is indeed the case, since the anaphor is coindexed with a coargument, so Condition A is met. Stated this way, Condition A successfully blocks all and only the (b) cases of (22)–(26). We showed that in these cases the predicate is reflexive-marked since one of its arguments is a SELF anaphor. Condition A therefore requires that it be reflexive, under definition (11a). Since no coarguments of this predicate are coindexed, this requirement is not met, and the derivations are filtered out. In the (a) cases, however, where the anaphor is not an argument, there can be no reflexive-marked predicate; hence, Condition A is satisfied. (Since the condition requires only reflexive-marked predicates to be reflexive, it is always met when a predicate is not reflexive-marked.) Another way to state this is that in these cases the condition does not apply.

As we showed in section 2, reflexivization contexts are also the only contexts in which SELF anaphors are in complementary distribution with pronouns. This means that the Condition A of the standard binding theory was descriptively mistaken in where it drew the border between acceptable and unacceptable anaphors. As argued also by Pollard and Sag (1992), some of the cases ruled in by the standard Condition A, like the adjunct anaphors in (7) and the picture-NP anaphors in (8), are just specific instances of logophoric anaphora, which are not different from the (a) examples of (22)–(26) and therefore do not justify a special treatment. Rather, the availability of SELF anaphors in these contexts should follow from Condition A, as stated here. With respect to adjunct anaphors, this is indeed the case, since only arguments reflexive-mark their predicates. But it cannot be obvious yet why our Condition A does not block anaphors in picture-NPs, and we address this issue in section 5.

This view of Condition A developed out of an emerging contention, particularly in the research on long-distance anaphora, that a distinction is needed between the grammatical function of anaphors and their discourse-oriented, or logophoric, use (Maling 1982, 1986, Hellan 1988, 1991, Thráinsson 1991). This distinction is discussed in detail, and extended to SELF anaphors, in Reinhart and Reuland 1989, 1991, and our approach, at that stage, is summarized in Reuland 1990. A view similar to what we assumed there has been independently proposed by Pollard and Sag (1992), who argue that Condition A applies only to anaphors in an argument position, identifying them with an argument higher in the relational hierarchy, whereas other occurrences of anaphors are exempt from this condition.

In fact, in the case of SELF anaphors, the distinction between anaphoric and logophoric uses is superfluous. Syntactically, there is just one type of SELF anaphor, whose

occurrence is governed solely by Condition A, as stated in (12'). This condition rules out argument SELF anaphors that occur in nonreflexive predicates (i.e., are not co-indexed with a coargument) and equally allows all other occurrences of such anaphors. In the contexts where the syntax allows both a pronoun and a SELF anaphor to be coindexed with a given antecedent, the choice between them is motivated by discourse considerations, as is often the case when there is more than one syntactic option to express the same proposition. For this reason, the use of an anaphor in such contexts may appear more marked than in the reflexivity environments, where the anaphor is the only grammatical option. There is no reason to assume that this type of discourse consideration is encoded in the syntax. Since the terms *anaphors* and *logophors* are by now widely assumed, we will continue to refer to the grammatical occurrences of SELF anaphors in nonreflexive contexts as logophoric; but we use this term in a wider sense than it had originally, a point we return to directly.

Though we have focused here only on the distribution and use of reflexive anaphors, Pollard and Sag (1992) argue that, in fact, reciprocal anaphors can occur in the same environments as the reflexive ones, which means that they also allow for what we have called here a logophoric use (see footnote 7).

3.2 Focus Anaphors

Condition A allows a SELF anaphor to be used logophorically just in case it does not occupy an argument position of a predicate, since in this case it does not reflexive-mark the predicate (though what counts as a predicate will be further specified). We may note that the study of discourse anaphors has observed two distinct uses. The use that was originally labeled *logophoric* (starting with Clements 1975) is the point-of-view use exemplified above. The other is the use of discourse anaphors as focus, which has been labeled *emphatic* (see Kuno 1987, Zribi-Hertz 1989). As focus, a free SELF anaphor can occur even in an argument position at S-Structure. Though such examples are harder to find and are more marked, some are given in (27).

- (27) a. This letter was addressed only to myself.
- b. Why should the state always take precedence over myself?
- c. "Bismarck's impulsiveness has, as so often, rebounded against himself." (quoted in Zribi-Hertz 1989)
- d. himself; [Bismarck's impulsiveness has, as so often, rebounded against *ei*]

That focus anaphors should appear exempt from our Condition A follows directly, if we assume, as is standard, that (Condition A applies at LF and) the focus expression undergoes movement at LF. In this case, the anaphors in (27) are no longer in argument positions. Hence, they do not reflexive-mark the verbs, so Condition A does not require the predicate to be reflexive. For example, the LF structure of (27c) is (27d), where *himself* is no longer the argument of the predicate *rebound* (though its trace is). Hence,

this predicate is not reflexive-marked at the syntactic level relevant for Condition A. (This point will be clearer after we define syntactic predicates, in section 4.)

We will keep the term *logophors* for both uses (thus departing from the way the term was originally used). SELF logophors, then, are all instances of SELF anaphors that do not reflexive-mark a predicate. There is no further need to define this notion, since, as just noted, it has no syntactic status (the binding theory only checks reflexive marking). When needed for discourse analysis, the two uses may be distinguished as *perspective logophors* and *focus logophors*. We do not think, however, that these two uses exhaust the options of logophoric occurrences. The crucial distinction needed is that between SELF anaphors that occur in an argument position at S-Structure and those that do not. The first can be used logophorically only as foci, as in (27), since this is the only way they can escape reflexive-marking their predicate. This is why such examples are more marked: they are possible only when the context clearly signals a focus, or contrastive reading, so they are highly context-dependent. Logophors not occurring in an argument position at S-Structure, like the (a) cases of (22)–(26), do not require any special accommodation and are easily judged acceptable with no context. Although in these examples they are used as perspective logophors, other, perhaps more crucial, discourse reasons exist to prefer a logophor over a pronoun, though we will not discuss them here.¹⁷ With respect to the binding theory, in any case, a SELF anaphor can always be used logophorically when it is not in an argument position.

3.3 Variable Binding and the Property $-R$

As we argued in section 1, the defining property of all anaphors, whether used anaphorically or logophorically, is $-R$. That is, they are referentially defective, and, unlike pronouns, they cannot be used to directly select an entity in the discourse. Hence, even a logophor can be most easily used with some sort of linguistic antecedent in the sentence. The peculiar property of perspective logophors is that they seem able to refer directly to the center of communication or consciousness. (See Reinhart and Reuland 1989 for more on this issue.) Nevertheless, even this use is easier when this center is mentioned already as an antecedent in the sentence, that is, with third person logophors. A logophor, however, does not have to be bound by its antecedent (though it may be). Their relation may be that of coreference, and not necessarily of variable binding.¹⁸ This point merits further clarification.

¹⁷ We think that the attempt to reduce all actual occurrences of logophors to the same point-of-view mechanism, as in Sells 1987, renders the concept "point of view" rather vacuous. Among the three uses Sells lists is "pivot," which has nothing to do with any familiar tests for point of view orientation. A more promising approach would follow from Ariel's (1990) analysis of anaphors. On her view, anaphors are used to signal that the antecedent is the most accessible of the available discourse-entities candidates. Accessibility is defined in terms of sentence topics.

¹⁸ On this issue, we disagree with Sells (1987) and with Chierchia (1989), who argue that at least perspective logophors are necessarily bound variables. This is discussed in more detail in Reinhart and Reuland 1989. Reinhart (forthcoming) argues that even logophors occurring in contexts of de se beliefs are not necessarily bound variables.

It is rather standard to assume that anaphors are necessarily interpreted as bound variables (e.g., Chomsky 1981). Thus, (28a) is interpretable only as (28b). Correspondingly, when an anaphor is placed in a context like (28c), there is no ambiguity, and only the bound variable reading (*Lucie praised Lili*) is believed to obtain. Similarly, (28d) is not easily construed as ambiguous.

- (28) a. *Lucie*, praised herself.
- b. *Lucie* ($\lambda x (x \text{ praised } x)$)
- c. *Lucie* praised herself, and *Lili* (did) too.
- d. Only *Lucie* praised herself.

Note that nothing in the theory as stated here requires an anaphor to be a bound variable even if it functions as a reflexivizer, as in (28). All we assumed, as the defining property of anaphors, is their $-R$ property, which does not entail that they must be bound variables.

However, the facts of (28) will still follow, if one also assumes Reinhart's analysis of variable binding (starting with Reinhart 1983), as summarized, for example, in Grodzinsky and Reinhart 1993. On this view, the only interpretation of syntactic coindexation is that of variable binding. Reinhart argues that coreference is not directly governed by the binding theory, or by any other sentence-level conditions, but falls, together with many problems of anaphora resolution, under discourse theory. Hence, sentence-level coindexation is irrelevant for coreference. Technically, coreference can be obtained only when a pronoun or an anaphor is not coindexed with an antecedent (since when a pronoun or an anaphor is syntactically bound, the only permitted interpretation is that of variable binding, and since unbound coindexation ends up uninterpretable in that system). For (28a) to allow the coreference interpretation, then, it should have a derivation in which *Lucie* and *herself* are not coindexed. But, given our Condition A, such a derivation would be ruled out, since in this case the predicate remains reflexive-marked and is therefore required to have two coindexed arguments.

On this view, then, there is nothing about the anaphor itself that forces it to be a bound variable. If an anaphor happens to be exempt from the coindexation requirement imposed by Condition A, as in the case of logophoric uses, its relation to its antecedent can be either that of variable binding or that of coreference, as illustrated in footnote 18. This is so because the grammar allows it, in this case, to be either coindexed or free, and if it is free, the coreference interpretation is allowed. This enables us to explain a puzzle noted by Sag (1976). He observed that a certain (small) percentage of his subjects could get the coreference (strict) interpretation in the VP-ellipsis context of (28c). As

As evidence that a logophor need not be a bound variable, consider (i).

(i) Only *Lucie* buys pictures of herself.

We will argue in section 5 that the anaphor in (i) is logophoric. Indeed, it is very easy to see an ambiguity here between the bound and the referential interpretation (*Lucie* is the only person who buys pictures of *Lucie*, though perhaps buying one's own pictures is true of everybody).

we have just argued, an anaphor can be exempt from Condition A when it is the focus (exemplified in (27)), even though this is a marked use. If, in (28c), the anaphor is used as focus, it does not reflexive-mark the verb, and Condition A is neutral about whether it is coindexed with its antecedent (yielding the bound variable interpretation) or not. If it is not coindexed, the coreference interpretation is allowed. However, the fact that this focus use of anaphors in an argument position is so marked explains why it is so hard to get this reading.

To sum up, an anaphor is obligatorily a bound variable only when it is required by Condition A to be coindexed with a coargument. In all other cases it can end up either syntactically bound (i.e., coindexed with a c-commanding NP) or not. Hence, it can either be a bound variable, or corefer.

4 Syntactic and Semantic Predicates

So far we have used the term *predicate* somewhat vaguely. Let us now spell out what kind of linguistic objects the binding conditions apply to, starting with a problem for Condition B:

- (29) a. *The queen invited myself for tea.
- b. The queen invited both Max and myself/me for tea.
- c. Max said that the queen invited both Lucie and himself/him for tea.

Condition A rules out (29a), since the predicate is reflexive-marked, but is not reflexive. By contrast, the predicates in (29b–c) are not reflexive-marked, so Condition A does not apply, and the anaphors here are used logophorically (as witnessed also by the fact that they can be replaced by a pronoun).

By the same reasoning, the anaphor in (30a) is logophoric as well. However, the problem is that in this environment the logophor is nevertheless in complementary distribution with a pronoun, as shown by (30b). So how does Condition B block anaphora in (30b)?¹⁹

- (30) a. The queen_i invited both Max and herself_i to our party.
- b. *The queen_i invited both Max and her_i to our party.

The predicates in (29) are not defined as reflexive at either S-Structure or LF, since the coindexed NPs are not coarguments of *invite* (the anaphoric expression being embedded). However, the question at issue here is what counts as a predicate. So far we have viewed the predicates of (30) as syntactic objects, but if we look at a more abstract level of semantic interpretation, the conjunction in (30) is interpreted as something equivalent to the representation in (31).

- (31) the queen ($\lambda x (x \text{ invited Max} \& x \text{ invited } x)$)

¹⁹ This problem was originally pointed out to us by Hans Kamp (personal communication).

This representation does contain a reflexive predicate (*x invited x*) as one of its conjuncts. If Condition B applies at the stage of mapping from LF to semantic representations (like (31)), it finds out that in (30a) one of the arguments of this new semantic predicate that is about to be formed is, appropriately, realized in the syntax (LF) as a SELF anaphor; hence, the translation yielding a reflexive predicate is allowed. But in (30b) no argument is a SELF anaphor in the syntax, so the reflexive translation is disallowed and the derivation is filtered out. In (29c) the conjunction does not yield a reflexive predicate (the conjoined predicates are *the queen invited Lucie* and *the queen invited him*); hence, the pronoun is allowed.

To capture such cases, then, Condition B must be allowed to operate on semantic predicates (i.e., at the stage of translating syntactic predicates into semantic ones). Before checking whether the same is true for Condition A, let us pursue further the implications of letting Condition B operate on semantic predicates.

An issue the standard binding theory has been preoccupied with is how to rule out anaphora in (32) (Chomsky 1973, 1980, Lasnik 1976, 1981).

- (32) a. *We₂ voted for me₁.
- b. *[Felix and Lucie]₂ praised her₁.

Presumably, this should be ruled out because, although the two arguments of the verb are, appropriately, not coindexed, they are nevertheless not disjoint in reference (*me* overlaps with *us*, etc.). Note that this could not follow from the standard binding theory as stated in Chomsky 1981. The fact that two NPs are not coindexed cannot, in this system, entail that they are disjoint, since then (33) would be ruled out as well.

- (33) [Felix and Lucie]₂ think that she₁ is terrific.

To capture this, one must (with Lasnik 1981) assume contraindexing, which is forced by Condition B in (34).²⁰

- (34) *Felix but not Lucie₁ praised her₁.

Regardless of the technical details, we find it highly unlikely that referential disjointness is the relevant factor here, since in (34), which is just as bad as (32b), the set of *Felix but not Lucie* most clearly excludes Lucie—hence, this NP and the pronoun are referentially disjoint.

One reason not much progress could be made on this issue is that judgments seem to vary with both speakers and sentences.²¹ A major factor is that, as we will argue in section 6, the standard cases currently falling under Condition B also violate the Chain

²⁰ Even so, it is not clear to us why, by the same reasoning, coreference would not also be incorrectly blocked in (i), where the italicized NPs must be contraindexed by Condition C.

(i) Lucie₁ thinks that [Felix and she]₂ are terrific.

²¹ In view of this variety of judgments, Fiengo and May (1990) conclude that sentences of this type are not ruled out at all by sentence-level grammar.

Condition, whereas the sentences under consideration here violate only Condition B. As we will show, it is generally the case that pure Condition B violations are weaker and subject to greater variety of judgment than Chain Condition violations. Still, there is another factor intrinsic to the choice of examples. For example, (36a) was observed to be grammatical by Fiengo and May (1990), and (35a–b) are better, for many speakers, than (32) and (34).

- (35) a. We elected me.
- b. Felix and Lucie₁ authorized her₁ to be their representative.
- (36) a. Max₁ and Lucie talked about him₁.
- b. *Both Max₁ and Lucie talked about him₁.

This second factor determining acceptability seems to be semantic. Whereas (32) and (34) prefer a distributive interpretation of the plural set, (35) forces a collective interpretation only. This can also be verified in (36): *both*, in (36b), forces the distributive reading (so it entails two separate acts of talking, by Max and by Lucie). In (36a) the preferred interpretation is the collective one, suggesting an act of mutual talking. So this type of anaphora is excluded only under the distributive reading, and anaphora enforces the collective reading (which for some speakers is possible also in (32) and (36b)). This result follows if Condition B operates on semantic predicates. The two interpretations of (36) are approximated in (37).

- (37) a. Max and Lucie ($\lambda x (x \text{ talked about him})$)
- b. Max ($\lambda x (x \text{ talked about } x)$) & Lucie ($\lambda x (x \text{ talked about } x)$)

Under the collective interpretation in (37a), the predicate is not distributed over the two NPs in the subject; rather, they are taken as one set. This way, no reflexive predicate is formed. Under the distributive interpretation in (37b), one of the predicates (*x talked about x*) is reflexive. None of its arguments has been reflexive-marked, so Condition B blocks the derivation. (34), repeated in (38a), is interpreted as some equivalent of (38b), in which an unlicensed reflexive predicate occurs as well.

- (38) a. *Felix but not Lucie praised her.
- b. [Felix ($\lambda x (x \text{ praised } x)$)] but not [Lucie ($\lambda x (x \text{ praised } x)$)]

The distributive interpretation of (32a) (*We voted for me) will also contain a reflexive predicate (*x voted for x*) whose argument is one of the members of the *we* set (i.e., *me*)—which is ruled out, since *me* is not SELF-marked.

As far as Condition B is concerned, then, the relevant predicates it applies to must be semantic. The same is not true for Condition A. Suppose that Condition A, too, applies at the stage of mapping into semantic representations: at this stage (29b–c), repeated in (39a–b), are also translated as a conjunction of predicates, illustrated for (39b) in (39c).

- (39) a. Max said that the queen invited both Lucie and himself for tea.
 b. The queen invited both Max and myself for tea.
 c. the queen ($\lambda x (x \text{ invited Max} \wedge x \text{ invited myself})$)

Checking the translation, Condition A finds out that one of the conjoined predicates (e.g., *x invited myself* in (39c)) is reflexive-marked, having a SELF anaphor as an argument. Since this predicate is not reflexive, Condition A will (incorrectly) filter the derivation out, if it applies at this level (in the same way that it rules out (29a), **The queen invited myself for tea*).

This (as well as other considerations that will soon become apparent) leads us to conclude that Conditions A and B are not precisely symmetric. Whereas Condition B is a condition on semantic reflexivization, Condition A is more syntactic, checking for syntactic marking of reflexivization. Following a line proposed by Ben-Shalom and Weijler (1990), we will capture this difference by letting Condition B apply to semantic predicates, whereas Condition A applies only to syntactic predicates. In the standard cases the two types of predicates are indistinguishable, but, as just illustrated, this is not always so.

Let us, then, define syntactic and semantic predicates, and incorporate them into our binding conditions. (40)–(41) state the final version of the binding theory we assume in this article (where (40c–d) simply repeat the definitions assumed already in (11)).

(40) Definitions

- a. The *syntactic predicate* formed of (a head) P is P, all its syntactic arguments, and an external argument of P (subject).
 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 relevant semantic level.
- c. A predicate is *reflexive* iff two of its arguments are coindexed.
- d. A predicate (formed of P) is *reflexive-marked* iff either P is lexically reflexive or one of P's arguments is a SELF anaphor.

(41) Conditions

- A: A reflexive-marked syntactic predicate is reflexive.
- B: A reflexive semantic predicate is reflexive-marked.

(We should note, again, that the intuition (41) intends to capture is statable formally only using the notion of i-reflexivization, as defined in (11). So, Condition A requires that an i-reflexive-marked syntactic predicate be i-reflexive, and Condition B requires that an i-reflexive semantic predicate be i-reflexive-marked. We continue to use the abbreviated version, for ease of presentation.)

The definition of semantic predicates is rather trivial. It is determined solely by

logical syntax, provided that the compositional rules mapping structures into function-argument configurations are defined. Deciding what counts as a syntactic predicate, however, is based on grammatical structure. There seems to be no disagreement on requiring that syntactic predicates should include all the arguments assigned a θ-role by the head P, but at least as far as binding is concerned, this is not sufficient. The line we take here follows, in essence, the notion of complete functional complex (CFC) proposed by Chomsky (1986b).²² We take the syntactic arguments of P to be those realizing a grammatical function of P, that is, its θ- and Case assignments. Generally, a Case-assigned NP also bears the θ assigned by P; but if it does not, the Case-assigned NP is nevertheless a syntactic argument of P. A syntactic predicate should also contain, by definition, the external subject of P. It is rather standard to assume that the subject θ-role is assigned not by the head P (e.g., V), but rather by the phrase (VP (Chomsky 1981, Marantz 1984)). Nevertheless, the subject is defined as belonging to the syntactic predicate of P. This would be so, even if the subject is not a θ-assigned argument at all. A subject is always required as an argument of the syntactic predicate. Therefore, a predicative head (P) does not always form a syntactic predicate, as defined in (40a): if it lacks an external subject, it may end up forming a semantic predicate, but not a syntactic one.²³

The arguments of a syntactic predicate thus do not necessarily correspond to its grid positions; that is, they do not need to be θ-arguments. This distinguishes our analysis from approaches attempting to capture Condition A by means of a thematic hierarchy, such as those of Kiss (1991) and others (see also the analysis of long-distance anaphors in Giorgi 1984). Let us look briefly at some of the reasons for and implications of this choice. (Others will unfold as we continue.)

In expletive or raising structures, like (42), the subject is clearly not a θ-argument of *seem*, *strike*, or *bother*.

- (42) a. Lucie seems to herself [t to be beyond suspicion].
 b. Max strikes himself [t as clever].
 c. *Max thinks that [it would bother himself [that the place is so noisy]].

If Condition A applies only to θ-arguments of predicates, it would have to rule out (42a–b), since no θ-coarguments are coindexed. But given our definition, the external subject (*Lucie*, *Max*) and the anaphor (as a θ-argument) are coarguments of the syntactic predicate, nevertheless, and Condition A is met. Similarly, we would like *bother* to form a syntactic predicate in (42c), since otherwise an anaphor could occur logophorically there.²⁴ Given our definition, the presence of an expletive subject is sufficient to form

²² Chomsky defines a CFC as a projection at which all grammatical functions compatible with the head P and (by definition) an external subject are syntactically realized. This entails that verbs, nouns, and adjectives may form syntactic predicates, but not prepositions, which do not license an external argument (Giorgi 1991).

²³ But see footnote 49 for more on this issue.

²⁴ This was brought to our attention by Luigi Rizzi.

such a predicate here. Consequently, (42c) is correctly ruled out, since a reflexive-marked syntactic predicate is not reflexive, in violation of Condition A.²⁵

ECM subjects as in (43) are defined as syntactic arguments of the matrix verb, since they are assigned Case by it.

- (43) a. Lucie expects [herself to entertain herself].
- b. *Lucie expects [myself to entertain myself].
- c. *Lucie₁ expects [her₁ to entertain herself].

An anaphor in this position cannot be used logophorically, as shown in (43b), since it reflexive-marks the matrix verb, without forming a reflexive predicate. Technically, then, Condition A is met in (43a) with no need for further elaboration, since the syntactic predicate of *expect* has two of its (syntactic) arguments coindexed (though we will return to further details of precisely how Condition A applies to the full range of these structures).

ECM structures provide one of the clearest instances of a discrepancy between syntactic and semantic predicates: the matrix syntactic predicate consists of both the subject and the Case argument of the verb (the embedded subject). However, in the semantic predicate, the whole embedded IP, rather than its subject, is the argument of the matrix verb. (Though alternative representations can be optionally derived, they are not obligatory.) Since our version of Condition B applies to semantic predicates, this means that it cannot, in fact, rule out the pronoun in (43c). A trivial way to avoid this result would be to allow Condition B to apply to all predicates rather than just to semantic ones. In this case, while still ruling out the semantic predicates discussed in, say, (32), it would also rule out the syntactic predicate of *expect* in (43c), as a reflexive predicate that is not reflexive-marked. However, we showed already in section 2.3 that the present result is precisely the correct one, where SE anaphors are concerned. In section 7, where we discuss ECM structures in detail, we argue that the same is true also for certain instances of pronominal anaphora. In our system, then, it is not Condition B that rules out the pronoun in (43c) (but the Chain Condition). In fact, the ECM discrepancy is one

²⁵ Jacqueline Guérion (personal communication) suggests that in structures like (ia), as well, the anaphor does not occupy a grid position, since, as argued in Guérion 1986, auxiliaries like *have* have no grid. The same might be true for the *be* of (ib).

- (i) a. You'll always have yourself.
- b. He is not himself today.

Still, Condition A must apply to such structures, as witnessed by the fact that an anaphor cannot be used logophorically in (ii) (focus readings aside).

- (ii) *You'll always have myself.

If this condition was sensitive to just θ-arguments, it could not apply here, but given our definition, the anaphor is defined here as a syntactic argument (being the Case argument). The syntactic predicate is, then, required by Condition A to be reflexive (i.e., to have two coindexed arguments), a requirement that is met in (i) but not in (ii). In the semantics, a semantic predicate is formed for (i), which is why Condition B will rule out a pronoun there.

of the major reasons we believe that Conditions A and B do not apply to the same types of predicates.²⁶

The binding conditions we assume still do not make any use of hierarchical relations like c-command, or hierarchies of thematic roles or grammatical functions. This distinguishes them from previous approaches in terms of argument structure, such as those of Pollard and Sag (1992) and Reinhart and Reuland (1989). The way the different components of the analysis conspire to yield the needed configurational effects is discussed in section 8.

5 P and N Predicates

So far we have focused our analysis on predicates formed out of verbs, but P and N also form predicates (at least in some cases). As shown in section 2, P and N projections are problematic for the standard binding theory, mainly since they often allow for both a pronoun and an anaphor (though not always). A crucial difference between these two types of predicates is that V predicates always have a subject, whereas P and N predicates do not, or at least do not always. (The different stands on this issue will be mentioned as we proceed.) Given the way we defined syntactic predicates in (40a), this means that verbs always form both syntactic and semantic predicates. But the subjectless P and N can only form semantic predicates. An examination of the anaphora patterns with these predicates will therefore clarify and support the distinction we assume here between syntactic and semantic predicates.

5.1 (Picture-)NP Anaphors

5.1.1 Condition A in NPs As noted earlier, for the standard binding theory the grammaticality of (8a), repeated in (44), is governed by Condition A, with some additional mechanism to explain why a pronoun is not excluded in this context.

- (44) Lucie saw a picture of herself.

²⁶ The distinction between syntactic and semantic predicates is crucial for the correct operation of Condition B in all cases where argument traces are involved:

- (i) Max_i was fired e_i.

In the case of A-movement, as in (i), the syntactic predicate always contains two coindexed arguments (the thematic trace argument and the subject). But the semantic predicate contains only one of these two (with an additional agent argument, probably existentially bound). Thus, the syntactic predicate is reflexive, but the semantic one is not. If Condition B applied to syntactic predicates, it would incorrectly rule out (i).

In the case of A-movement, the problem arises when an anaphor is raised, as in the focus movement in (ii). (This problem was pointed out to us by Daniel Fox.)

- (ii) a. Max praised (only) himself.
- b. himself; [Max praised e_i]

The trace is the argument of the syntactic predicate in (ii) (as the projection receiving the θ-role). So, if Condition B applied to syntactic predicates, the derivation would be ruled out as non-reflexive-marked. However, *himself* is still the semantic argument of *praise*, so the semantic predicate meets Condition B.

However, in addition to the lack of complementarity with pronouns, such structures show all the properties of logophoric anaphora. Ross (1970) has already noted that a first person anaphor can occur there freely, as in his (45a). Similarly, the third person anaphor functions as a perspective logophor (45b–c). Many other counterexamples to the syntactic view of picture-NP anaphora (like (45c) and (46a)) are cited by Jackendoff (1972).

- (45) a. A picture of myself would be nice on that wall.
- b. Lucie thought that a picture of herself would be nice on that wall.
- c. The queen demands that books containing unflattering descriptions of herself will be burned.

A diagnostic property of logophoric anaphora (see, for example, Thráinsson 1991) is that on that use the anaphor does not have to be c-commanded by its antecedent. Such cases can easily be constructed with picture-NPs, as in (46). More generally, an anaphor in NPs always allows the coreference, and not only the bound variable, interpretation. (See footnote 18.) There is therefore no reason to attempt a separate account for (44).

- (46) a. The picture of himself that John saw in the post office was ugly.
- b. Her pleasant smile gives most pictures of herself an air of confidence.

Under our analysis, a SELF anaphor can be logophoric iff it does not reflexive-mark its syntactic predicate (otherwise Condition A rules it out). This is obtained either when it is not an argument, as in the cases we have examined so far, or when it is an argument of a head that does not form a syntactic predicate (since in this case there is no syntactic predicate that it could reflexive-mark). Let us suppose that complements of the *picture*-N are assigned a θ-role by it and are therefore syntactic arguments. Even if this is not so, the same anaphora facts are found with Ns that clearly assign a θ-role, such as *description* in (45c). Given the definition of syntactic predicates in (40), the Ns in all the examples above nevertheless do not form such a predicate, since they lack an external argument. (A PRO-type subject in such cases is always only optional.) Condition A applies to reflexive-marked syntactic predicates. Since no such predicate exists here, the condition is met (i.e., it does not apply).

The Subject Condition, which was incorporated into the definition of governing category in the standard binding theory, is thus captured here within the definition of syntactic predicates. This is how we capture the difference traditionally assumed between (47a) and (47b). When the subject is present, as in (47b), the N forms a syntactic predicate. Since one of its arguments is a SELF anaphor, Condition A now applies to require that it be reflexive. But no two arguments of *picture* are coindexed, so the derivation is ruled out.

- (47) a. Lucie liked [(a picture of herself)].
- b. *?Lucie liked [your picture of herself].

The advantage of this formulation of the Subject Condition is that it also governs the distribution of logophoric anaphora. That this generalization is closer to correctness than the governing category formulation is witnessed by the fact that logophors are also less acceptable when the subject is present. Compare (45a) and (46a) to (48).

- (48) a. *?Your picture of myself would be nice on that wall.
- b. *?Your picture of himself that John saw in the post office was ugly.

The reason here is the same as before: because a syntactic predicate is formed, and it is reflexive-marked (just like the one in (47)), Condition A applies to rule it out. The contrast between, say, (45a) and (48a) seems to us no different from that between (44) and (47b).

This is the place to note that the judgments on NP anaphora are much less clear than the linguistic literature tends to assume. Ben-Shalom and Weijler (1990) report that in their informal empirical testing of judgments, speakers did not agree even on the basic facts, for example, that a contrast exists in (47). This could be explained, in our framework, if one takes the view of Williams (1985) that NPs never contain a subject. Even when their Spec is filled, as in (47b), it is not a subject. If this is the case, all instances of NP anaphora will turn out to be logophoric, since NPs, in this case, never form a syntactic predicate, so Condition A never applies. To the extent that there is still any consistent difference between the sentences in (47) or between (45) and (48), it should be attributed to discourse reasons, of the sort mentioned in footnote 17. Given that logophoric anaphora is always subject to more variations in judgment than reflexivization (requiring some accommodating discourse), these disagreements over NP anaphora will be less surprising. However, we leave this question open here.

5.1.2 Condition A and Reconstruction A further advantage of acknowledging logophoric NP anaphora is that it eliminates the need for reconstruction mechanisms, in the specific case of Condition A. (For a discussion of the problem see for example Chomsky 1977, May 1977, Van Riemsdijk and Williams 1981, Higginbotham 1983, Barss 1986, Lebeaux 1988.) In structures like (49), our Condition A faces no problem, even if no other LF operations apply. The anaphor can choose any of the potential antecedents regardless of c-command and governing category, since its NP does not form a syntactic predicate, so it is not restricted by Condition A.

- (49) a. Which picture of himself/herself does Max think that Lucie likes?
- b. Max knows which pictures of himself/herself Lucie likes.

As for the contrast between (49) and (50), Chomsky (class notes), following a proposal of Huang (1993), suggests that this problem can be solved if we assume that a subject is generated in the Spec of its predicate (VP, AP, etc.) and raises to the Spec of IP position, as proposed by Sportiche (1988) and Koopman and Sportiche (1991).

- (50) a. How proud of *himself/herself, does Max think that *Lucie₁* is?
 b. Max knows how proud of *himself/herself, *Lucie₁* is.
 c. how [_{t₁} [proud of herself, /*himself₂]]]

In this case the internal structure of the moved AP contains the trace of its moved subject (*Lucie*), as illustrated in (50c). In our terms, then, *proud* here, unlike the NP cases, does form a syntactic predicate, since it contains a subject. This predicate is reflexive-marked by the SELF anaphor; hence, it is required by Condition A to be reflexive. This requirement is met only if the anaphor is coindexed with the subject trace, so only *herself* (coindexed with the trace of *Lucie*) is allowed here. The same would be true for VP-preposing, as illustrated in (51).

- (51) [_{t₁} compromise herself,/*himself₂] though Max₂ said that *Lucie₁* did, she is still terrific.

This means, therefore, that reconstruction is not needed to explain the distribution of anaphors in these contexts. Similarly, anaphors in experiencing contexts such as (52a) pose no different problems than anaphors in any other context of logophoricity.²⁷

- (52) a. Jokes about herself amuse *Lucie*.
 b. Jokes about herself,/her, amuse every philosopher₁.

This does not entail, though, that the problem of reconstruction is eliminated altogether.²⁸ The contexts we have examined still pose a problem for the theory of variable binding. Though the logophor in, say, (52a) need not be a bound variable, it can be, as illustrated in (52b) with a quantified antecedent (and as can be further checked in ellipsis contexts). Similarly, in (49) the anaphor could also be a bound variable, as can be shown by substituting a quantified NP for *Max* or *Lucie*. In this respect, there is no difference between logophors and pronouns in contexts like (49) and (52)—both can serve as bound variables, as illustrated for the experiencing context in (52b). Generally, variable binding requires that the antecedent c-command the variable at some level, which is not the case at S-Structure for the structures under consideration. In sum, then, our analysis can shed no new light on the general issue of the precise formulation of variable binding (which is captured in standard GB Theory by the Bijection Principle, or in Reinhart's

²⁷ An *LJ* reviewer wonders why (i) is worse than (52a) or (ii).

(i) Pictures of herself fell on *Lucie*.
 (ii) Pictures of herself amused *Lucie*.

The answer lies in our discussion of logophoricity in section 3. Whenever a logophor is possible, a pronoun is just as possible, and the choice between them is likely to rest on some discourse motivation. As noted in section 3, a very common context facilitating the choice of a logophor is that of point of view, or consciousness report. Experiencing structures, such as (ii), constitute prototypical consciousness reports, whereas structures like (i), in isolation, do not. Even though more could be said here, the precise specification of the discourse conditions governing the actual use of logophors lies, together with many other marvels of language use, well beyond the scope of what we need to know for the syntax of anaphora.

²⁸ We thank Tohru Noguchi for pointing this out to us.

approach by the translation procedure for indices). But reconstruction is not needed at all for the binding conditions themselves, as they are stated here.

5.2 Condition B in NPs

Let us look next at the way Condition B works in NPs. None of the structures mentioned so far pose any problem for Condition B if a pronoun replaces the anaphor, as for example in (53a). Since no arguments of N are coindexed in such cases, no reflexive semantic predicate is involved, and Condition B is met. The contrast to look at, though, is the one in (53)–(55), discussed by Jackendoff (1972), Chomsky (1986b), and Williams (1987).

- (53) a. *Lucie₁* saw a picture of her₁.
 b. **Lucie₁* took a picture of her₁.
 (54) a. Max₁ heard a story about him₁.
 b. *Max₁ told a story about him₁.
 (55) **Lucie₁* performed an operation on her₁.

What such cases illustrate is that the syntactically unrealized 0-role of N may appear to be present nonetheless, affecting the anaphora options of the realized N arguments. The lexical semantics of the verb entails that in (55) the agent of the verb must be identical to the agent of *operation*. Similarly, in (53b) and (54b) it is identical to the agent (producer) of *picture* or the teller of *story*. These N roles appear to produce a Condition B effect inside the NP. In the case of *see* and *hear*, where the agents are not identified, no such effects are found.

Two analyses of the structure of such NPs have been proposed. Chomsky (1986b) argues that a PRO-like element is present in the Spec of NP (or DP) of the starred cases above, as illustrated in (56) for (54b). (Abstracting away from the precise details of his analysis, we may assume that this PRO, which is always optionally present in NPs, is obligatorily required here, for the verb to assign its control feature.) In this case, any version of Condition B will successfully block the coindexation inside the NP.

- (56) *Max₁, told [PRO₁ story about him₁].

However, Williams (1982, 1985, 1987) argues convincingly that a PRO analysis for NPs is not feasible and, furthermore, that the apparent control effects show up also when the Spec position is filled, or when PRO is otherwise impossible. Instead, he proposes that the N agent role, which is not syntactically realized, is satisfied in the lexicon, and thus gets some referential value, either from the context, or by control. In the latter case, the index of, for example, *Lucie* in (55) is assigned directly to the agent role of *operation*, rather than to an NP realizing this position syntactically. The same is true also when the Spec of NP is lexically filled, as in (57).

- (57) a. Max performed *Lucie*'s operation.
 b. Yesterday's operation was successful.

In (57a) the agent of *operation* is controlled by *Max*, and in (57b) its value is supplied by the discourse. This line of analysis is further developed and defended by Grimshaw (1986, 1990).

This view of the argument structure of N predicates provides direct support for our distinction between syntactic and semantic predicates. Recall that Condition B applies to semantic predicates. Hence, for this condition (unlike Condition A), it is irrelevant whether all the arguments are realized syntactically. The value assigned to the agent role is an argument of the semantic predicate formed by the N. In (53b), (54b), and (55) the semantic predicate of N is reflexive regardless of whether the agent role is realized by PRO or is controlled directly, since in both cases this role and the pronoun end up coindexed (with the same index as the controller of the N role). Given that no SELF anaphor is present, this reflexive predicate is ruled out.²⁹

5.3 Predicative PPs

In our initial discussion of PPs in section 2.2, we noted (following Marantz (1984) and others) that prepositions vary in whether they form their own predicate or not. In a standard three-place V predicate, as in (58), P does not form its own predicate. It functions only as a role selector for the verb, and its NP complement is just an argument of the V predicate. Hence, no coindexation of any of the three arguments of the V predicate is possible without reflexive marking. But in the case of locative and directional PPs, as in (59), the P forms its own predicate. Hence, the NP complement of P is an argument of P, rather than of the V. As noted in section 2.2, this is so regardless of the selection of the verb. In (59b) the verb selects for a location role; that is, the PP is its selected argument. But the NP complement of P is not.

- (58) a. Lucie₁ explained Max to *her₁/herself₁.
 b. Lucie explained Max₂ to *him₂/himself₂.
 c. Lucie₁ explained *her₁/herself₁ to Max.
- (59) a. Max₁ saw a ghost next to him₁/himself₁.
 b. Max₁ put the book next to him₁/himself₁.
 c. Max₁ pulled the cart towards him₁/himself₁.
- (60) a. *Lucie₁ said that I explained Max to herself₁.
 b. Lucie₁ said that Max saw a ghost next to herself₁.

²⁹ Where the two approaches may differ empirically, given our system, is in the case of Condition A. If a syntactic PRO subject is obligatory in the control cases, a logophor would be excluded. For example, (iia), with the structure (iib), should be worse than (i), which allows also the no-PRO structure, since only in (iib) is a syntactic predicate formed. If the agent role is controlled lexically, as in Williams's approach, then (i) and (ii) are indistinguishable syntactically (in both cases no syntactic predicate is formed for the N), so they should be equally allowed by Condition A.

(i) Max was glad that Lucie saw [a picture of himself].
 (ii) a. Max was glad that Lucie took a picture of himself.
 b. Max was glad that Lucie took [PRO] picture of himself.

Though the judgments are subtle, they seem to favor Williams's approach.

This means that in checking the index of the NP in the PP, our binding conditions apply differently to the two types. In (58) they check the top V predicate; in (59) they check only the P predicate. Condition B thus rules out the coindexed pronouns in (58), since the coindexation renders the V predicate reflexive. But this predicate is irrelevant for Condition B in (59). Condition A allows a SELF anaphor in both cases, but, again, in different ways: in (58) the anaphor is a reflexive marker of the verb *explain*. But in (59) the situation is analogous to what we have just observed with NPs: since there is no subject, there is no syntactic predicate, so the condition is automatically met (that is, it does not apply). This means that in (59), unlike (58), the anaphor should have logophoric properties. Indeed, although the anaphor of (58a) cannot be long-distance bound, as in (60a), the locative anaphor can, as in (60b). The use of anaphors in (59) is much more marked than their use in (58). (Hestvik (1991) surveys the varying judgments on these structures in the linguistic literature.) Part of the reason is that in (58) the only grammatical choice is using the anaphor (since a choice of a pronoun violates Condition B), whereas in (59), as far as syntax goes, both a pronoun and an anaphor are possible.

The way Condition B works in locative and directional P predicates deserves more attention. A problem that has not been dealt with much previously is that illustrated below. Whereas the pronoun argument of P can be freely coindexed with the external argument of the verb in (59), or in the (a) cases of (61) and (62), it cannot be coindexed with the internal argument in (61b) and (62b).³⁰

- (61) a. Max₁ rolled the carpet over him₁.
 b. *Max rolled the carpet₁ over it₁.
- (62) a. Max₁ directed Lucie towards him₁.
 b. *Max directed Lucie₁ towards her₁ (in the mirror).

It may appear tempting to consider a small clause solution to this problem, assuming that the accusative argument is a subject of a PP small clause. Such an approach is discussed and rejected by Chomsky (1981) and Koster (1985), but a brief discussion from the present perspective will nonetheless be helpful. In this case, the sentences of (61) have the structure in (63), which is analogous to the standard small clauses in (64). Indeed, Condition B seems to apply in the same way to both structures. In (63b) and (64b) it encounters a reflexive predicate with no reflexive marking, and rules it out. The parallel predicates in (63a) and (64a) are not reflexive and hence are well formed. However, this

³⁰ We are not aware of any discussion of this problem in the literature. Hestvik (1991), who discusses both PP anaphora and its research history in detail, assumes that with structures of types (60)–(61) the object can freely bind the pronoun. However, all his examples are of the type in (i), where the pronoun is further embedded in an NP.

(i) John put Bill₁ in front of a picture of him₁. (Hestvik 1991:463, (12a))

He further explains that he added the picture-NP "to improve the pragmatics of the examples" (Hestvik 1991: fn. 2) and that this change could not affect the discussion, since "we know that indefinite NPs do not count as domains for Condition B anyway" (1991: fn. 2). Although this is true for the standard binding theory Hestvik is assuming, in our framework examples like (i) have nothing to do with the problem under consideration (the pronoun being an argument of the semantic predicate of *picture*, which is not reflexive).

parallelism breaks down when we look at the anaphors in (63c) and (64c). If these sentences have the same structure, then Condition A should, incorrectly, rule out (63c). Since in this case P has a subject, it forms a syntactic predicate, which is subject to Condition A. (The standard Conditions A and B will have precisely the same problem here, but see footnote 31 for a potential way to maintain the small clause analysis.)

- (63) a. Max₁ rolled [the carpet₂ over him₁].
- b. *Max₁ rolled [the carpet₂ over it₂].
- c. Max₁ rolled [the carpet₂ over himself₁].
- (64) a. Lucie₁ heard [Max₂ praise her₁].
- b. *Lucie₁ heard [Max₂ praise him₂].
- c. *Lucie₁ heard [Max₂ praise herself₁].

We may note further that the generalization that governs Condition B effects in locative PPs cannot be stated in purely structural terms, as may have appeared from the discussion so far. For example, it is not always the case that the pronoun cannot be coindexed with the verb's internal argument. In (65) it can. In other cases the locative pronoun cannot be coindexed with the external argument of the verb, as in (66) (where there is also no potential subject to form a small clause). In such structures as well, the locative PP induces Condition B effects in some cases (66a–b), but not in others (66c).

- (65) Max praised/examined the carpet₂ underneath it₂.
- (66) a. *Max₁ stepped on him₁.
- b. God is in zichzelf/*zich₁. (Spinoza, pointed out by Jan Voskuil)
 God is inside itself₁/*it₁.
- c. Max₁ looked around him₁.

The intuitive appeal of a small clause analysis in the specific case of locatives and directional prepositions is that such Ps appear to behave like two-place predicates, that is, as expressing a relation between two arguments. For example, a sentence like (61a) entails the carpet being over Max at some point. But, given that this analysis so far cannot solve the problem in (63), is there an alternative way to capture this intuition? Let us explore the analogy with Condition B effects in N predicates that we observed. We may assume that locative and directional prepositions indeed take two θ-roles. But, along the lines of Williams's and Grimshaw's analysis of the control of N roles (see section 5.2), only one of these is realized syntactically, as the P complement, whereas the other is satisfied in the lexicon and assigned a value by control. Teun Hoekstra (personal communication, 1991) suggests that this role can be controlled either by an argument of the verb or by the abstract EVENT argument. Thus, in (61)–(63) the unrealized role of P is controlled by the verb's internal argument, yielding *over*, in (63a) as a relation holding between the carpet and Max. But in (65) the relation *underneath* holds between the carpet and the event of Max's praising or examining the carpet, which means that the unrealized role is controlled by the EVENT role. Similarly, in the in-

transitive case of (66a–b) the P-role is controlled by the subject, whereas in (66c) it is the event of looking that is the semantic argument of *around*. As was the case with NPs, control is largely determined by the semantics of the verb. (Possibly, the relations here are more systematic than in the case of N arguments.)

On this view, then, our Condition B works in predicative PPs just like it did in NPs. The value assigned to the syntactically unrealized role is a semantic argument of the predicate. Since Condition B applies to semantic predicates, this argument is visible to it. If the assigned value has the same index as the second (syntactic) argument of P, then P forms a reflexive predicate, which is licensed only if it is reflexive-marked. For example, in (66a) (*Max₁ stepped on him₁), the semantic predicate formed is *on* (Max₁, him₁). This reflexive predicate is non-reflexive-marked and hence ruled out. (62b), (63b), and (66b) are filtered out in the same way. In all other sentences, no reflexive predicate is formed in the semantics, so Condition B is met.

5.4 Conclusions: Syntactic and Semantic Predicates

In conclusion, let us look again at the full paradigm of the PP anaphora of (63), repeated in (67). Here the preposition forms a semantic two-place predicate, whose first (syntactically unrealized) argument is assigned the index of *the carpet*. But, by definition, it does not form a syntactic predicate (since P does not have a subject). This entails, in our system, that only Condition B can apply to this predicate. In two of the cases—(67b) and (67d)—the semantic predicate is reflexive. Condition B allows the reflexive-marked (67d) and rules out the unmarked (67b). Since the anaphors in both (67c) and (67d) are not arguments of a syntactic predicate, Condition A has nothing to say about either. As far as syntax is concerned, then, both are equally allowed. (67c) may still seem more marked than (67d), since this coindexation also permits the use of a pronoun, as in (67a), so some discourse motivation for choosing the anaphor is required.

- (67) a. Max₁ rolled the carpet₂ [over him₁].
- b. *Max₁ rolled the carpet₂ [over it₂].
- c. Max₁ rolled the carpet₂ [over himself₁].
- d. Max₁ rolled the carpet₂ [over itself₂].
- (68) a. Max₂ gave Lucie₁ [a lecture on her₁].
- b. */?Max₂ gave Lucie₁ [a lecture on him₂].
- c. Max₂ gave Lucie₁ [a lecture on herself₁].
- d. Max₂ gave Lucie₁ [a lecture on himself₂].

We may now note the analogy of P predicates and N predicates. The anaphora pattern in (68) parallels that of (67). The subjectless *lecture* only forms a semantic predicate, but its implicit agent role is controlled by *Max* (the lecturer). In (68b) and (68d), then, this predicate ends up reflexive, and the unmarked (68b) is ruled out by Condition B. (68c–d) are analogous to (67c–d): Condition A has no say on anaphors occurring in nonsyntactic predicates.

What P and N have in common, then, is that the predicates they form are not syntactic, given our definition. Hence, we find a different pattern of anaphora here than in the case of V predicates. On this analysis, all predicative heads form semantic predicates, but only a subset also forms syntactic predicates. Hence, we find Condition B effects in predicates with all these heads (P, N, V), but Condition A effects only with the syntactic V predicates. A question that may be reopened is, What is the defining property of syntactic predicates? Conceptually, this is reminiscent of the older question, What is the domain for anaphor binding? Starting with Chomsky 1973, two parameters have been considered: subject and tense. Here, we chose the subject parameter, in order to capture the traditional judgments on anaphora in NPs with a subject, which we mentioned in (47) (and which we doubt, as we said). Alternatively, one might take eventhood (or having an event role) as the defining parameter, since this (descendent of the tense parameter) also distinguishes V from P and N predicates.³¹

6 R-Properties and the Chain Condition

6.1 R-Deficiency: Pronouns and SE-Pronominal Anaphors

So far we have shown that Condition B uniformly rules out all reflexive predicates that are not reflexive-marked. The two types of pronominals we have discussed, pronouns and SE anaphors, are indistinguishable with respect to this condition. In Dutch, for example, both are ruled out in (69); but in the predicative PP of (70), both are allowed.

- (69) Willem₁ bewondert zichzelf/*zich₁/*hem₁.
 Willem₁ admires himself₁/*SE₁/*him₁.

- (70) Klaas₁ duwde de kar voor zich₁/hem₁/*zichzelf uit.
 Klaas₁ pushed the cart before SE₁/him₁/*himself₁ out

Still, we find differences in their distribution that cannot follow from what we have said so far. Historically, Condition B was developed to account for languages like English with just one pronoun type. SE anaphors are therefore extremely useful in checking the precise scope of Condition B, and the way it interacts with other linguistic modules.

³¹ If the definition of syntactic predicates is changed to require an event role, the small clause analysis of the PPs we examined becomes feasible. As shown in the discussion of (63)–(64), the problem was that an anaphor in the standard small clause of (i) is excluded, but it is allowed in the PP small clause in (ii). (iib) is an alternative small clause analysis proposed by T. Hoekstra (1991), which fares better in capturing correctly the various options of control we discussed.)

(i) *Lucie₁ heard [Max₂ praise herself₂].
 (ii) a. Max₁ rolled [the carpet₂ over himself₂].
 b. Max₁ rolled the carpet₂ [PRO₂ over himself₂].
 (iii) *Max₁ rolled the carpet₂ [PRO₂ over it₂].

By the event definition, though, the small clause in (ii) forms only a semantic predicate and not a syntactic one, so Condition B applies, but not Condition A, which is what we wanted. Given this structure, a chain is also formed in the small clause of (67b), given in (iii). Hence, as we will show in section 6, the pronoun in (67b) is also ruled out by the Chain Condition. This is consistent with the fact that this sentence is in fact worse than its analogue with NP, in (68b), which shows the standard weaker Condition B effects.

Pronouns and SE-pronominal anaphors differ, first, in contexts of intrinsic reflexivization. We noted in section 2 that when the predicate is lexically reflexive, as in (71), SE is allowed, unlike in (69), since in this case the reflexive predicate is appropriately marked and Condition B is therefore met. In this context, the theory seems to face a problem: unlike in (70), the SE anaphor cannot be replaced with a bound pronominal.

- (71) Willem₁ schaamt zich₁/*hem₁.
 Willem₁ shames SE₁/*him₁.

Similarly, although intrinsically reflexive verbs that realize their internal argument are rarer in English, *behave* and *pride* in (72) are such verbs (as witnessed by the fact that they cannot take any noncoindexed object). Condition B would be met if a pronoun occurs in these cases, but its appearance is nonetheless ungrammatical. The same is true for the Dutch translations of these sentences, as in (72), except that a SE anaphor, not available in English, is allowed here.

- (72) a. Lucie behaved herself/*her (well).
 Lucie gedroeg zich/*haar (goed).
 b. Lucie prides herself/*her on her notorious modesty.
 Lucie beroemt zich/*haar op haar welbekende bescheidenheid.

A similar problem may also arise when the verb is not lexically reflexive, in the case of a three-place predicate, which we discussed in (21), partially repeated in (74).

- (73) a. *He₁ accidentally assigned him₁ to himself₁.
 b. He₁ accidentally assigned himself₁ to himself₁.
 (74) Henk₁ wees zich/*hem₁ aan zichzelf₁ toe.
 Henk assigned SE to himself

The predicate in (73a) is defined as reflexive-marked, since the definition requires only one argument to be a SELF anaphor. Condition B is therefore satisfied in this sentence. Indeed, in the Dutch translation in (74), *zich* can occur. But if Condition B is all there is, then the pronoun should be just as possible, which is not the case in either English or Dutch.

Additional differences between pronouns and SE anaphors occur in ECM subject position:

- (75) a. *Jan₁ hoorde zich₁/hem₁.
 Jan heard SE/him
 b. Jan hoorde [zich zingen].
 Jan heard [SE sing]
 c. *Jan₁ hoorde [hem₁ zingen].
 Jan heard [him₁ sing]

Condition B correctly blocks the SE pronominal (as well as the pronoun) in (75a), where it is a syntactic and a semantic coargument of its binder. But, as stated, Condition B

cannot block binding of an embedded ECM subject, since it applies to semantic predicates, and this subject is not necessarily a semantic coargument of its matrix binder. (We will explore this point in more detail in section 7.) This turns out to be the correct prediction for SE pronominals, which can indeed be bound here, as in (75b). But a pronoun in the same context cannot be bound either in the Dutch (75c) or in its English equivalent.

In all these cases, then, the SE-pronominal anaphors behave precisely as predicted by our Condition B, but the pronouns appear mysterious. Since the standard Condition B of GB Theory was developed for languages like English, it was designed to capture correctly the distribution of the pronouns in all the examples above, but it leaves unexplained the distribution of the SE pronominals. Here, we have taken the alternative line: it is in fact the SE pronominals that reflect the precise scope of Condition B, and it is the pronouns that require some additional account, in the above contexts.

To see what that additional account could be, let us look again at the feature analysis of the various anaphoric expressions we examined in section 1. The summary given in (4) is repeated here.

	SELF	SE	Pronoun
Reflexivizing function	+	-	-
R(erefential independence)	-	-	+

In fact, we have so far made use of only one of the distinguishing properties in (4). As we stated them, all the binding conditions care about is the reflexivizing function, which only SELF anaphors carry. In this regard, pronouns and SE-pronominal anaphors are identical: for Condition B, they equally fail to reflexive-mark a predicate. However, the other property, referential independence, cuts the pie in a different way: here SELF and SE expressions form one group, which is the one traditionally referred to as anaphors. From this perspective, pronouns are the exceptional case, and they pattern with the standard, fully specified, +R arguments. If it turns out that there exists a module of linguistic knowledge that is, independently, sensitive to this R property, it would not be surprising that with respect to this module, pronouns behave differently from the SE-pronominal anaphors.

6.2 Movement and Binding: The Chain Condition

One of the central ideas in Chomsky 1973 was that NP-movement and anaphora are closely related. In the GB framework of Chomsky 1981, this was implemented by defining NP-traces as anaphors, which are consequently governed by the binding theory. This parallelism between A-binding and A-movement seems to have been given up in the "barriers" model of Chomsky 1986a (see also Lasnik 1985 for discussion). In the discussion of the licensing of NP-trace (Chomsky 1986a:74–79) Condition A in its original form plays no independent role, and NP-movement is restricted by chain theory. Even if Condition A still holds of the coindexation of an NP and its trace, no such coindexation

can violate Condition A, without also failing to form a well-formed A-chain and hence violating the ECP. Nevertheless, we believe that this correlation is not accidental, and that the reason why it was discovered in the first place is that certain anaphora issues that have been assumed to fall under the binding theory in fact belong to chain theory (and not conversely, as was initially assumed). Specifically, these are all issues of binding sensitive to the R properties of NPs.

To show this, let us check, first, what might have been the underlying intuitive basis for viewing movement and anaphora as governed partially by the same restrictions. Regardless of any specific implementation, the empirical generalization remains the same as observed in Chomsky 1973: in the syntactic domain in which a moved NP can bind its trace, an NP can bind an anaphor (-R), but it cannot bind a pronoun or any non-anaphor (+R). This is illustrated in (76)–(78).

- (76) a. Felix₁ was fired t₁.
 b. Felix₁ behaved himself₁.
 c. *Felix₁ behaved him₁.
 d. *Who₁ [did he₁ behave t₁?]
- (77) a. He₁ is believed [t₁ to be smart].
 b. He₁ believes [himself₁ to be smart].
 c. *He₁ believes [him₁ to be smart].
 d. *Who [does he₁ believe [t₁ to be smart]]?
- (78) a. Felix₁ was expected [t₁ to consider [himself₁, smart]].
 b. Felix₁ expects [himself₁, to be considered [t₁, smart]].

Given current syntax, the domain illustrated in (76)–(78) may be called the *A-chain domain* of a given NP. An A-chain, under its broadest definition, is any sequence of coindexation that is headed by an A-position and satisfies antecedent government; that is, each coindexed link, except for the head, is c-commanded (i.e., m-commanded) by another link, and there is no barrier between any two of the links. By definition, then, the A-chain domain of a given NP is a subset of its c-command domain (down to the first relevant barrier), or, in the terms of current syntax, it is a subset of the binding domain of this NP. The question of what counts as a barrier, and, consequently, the precise definition of the A-chain domain is a topic of much current research and debate. For our purposes the approaches in Chomsky 1986a and Rizzi 1990 appear to be essentially equivalent. In any case, we do not find it necessary to dwell on the differences in view of the rudimentary stage of chain theory.³² In the current implementations of chain

³² A more precise definition of chains is given in (i), following Chomsky (1986a,b).

(i) *Generalized chain definition*
 $C = (\alpha_1, \dots, \alpha_n)$ is a chain iff C is the maximal sequence such that
 a. there is an index i such that for all j, $1 \leq j \leq n$, α_j carries that index, and
 b. for all j, $1 \leq j < n$, α_j governs α_{j+1} .
 (ii) a. Felix₁ [seems [t₁ to be sick]].
 b. Felix₁ seems'-I₁ [vp t'₁ [tp t₁ to be sick]].

theory, only trace-tailed coindexations end up as actual A-chains (see footnote 33). But here we will defend the broader definition, under which the coindexation in all the sentences of (76)–(78) forms an A-chain, though only in the (a) and (b) cases is the result grammatical.

Bound coindexation is extremely widespread in syntax. Why should the subdomain of A-chains be singled out as having a special status? The answer, underlying the research in current syntax, is that coindexation within the A-chain domain has the unique property of allowing the coindexed positions to form a single argument (and, in some cases, like those of the NP-movement above, forcing this as the only option). This is clearly not the standard interpretation of coindexation. Except for the cases of well-formed A-chains, coindexed argument positions always correspond to distinct arguments. It is not very surprising, therefore, that the environments allowing such argument reduction are severely restricted, or obey a specific syntactic condition.

The way chain theory is currently implemented, only a subset of A-chains—those formed by NP-movement—are actually assumed to fall under it. The current Chain Condition (e.g., Chomsky 1986a) has the effect of defining a coindexation as an A-chain only if it has exactly one Case, in its head position, and exactly one θ-role.³³ Technical

For government (of clause (ib)) to hold, there should be no barriers between the governor and the governee. In the framework of Chomsky 1986a, VP in for example (iia) is a barrier that can be canceled by movement of V to I, but V, or its LF trace, forms a minimality barrier, even when it moves to I at LF. Hence, the coindexation in (iia) cannot count as an A-chain without further assumptions. To solve this, Chomsky argues that in A-chains across the VP, coindexation works via a link of V and I, as in (iib): the subject *Felix* is coindexed with I independently (for issues of agreement). Roughly, then, when V moves to I, it gets the same index. So in effect, the subject governs its trace via the coindexed V.

For Rizzi (1990), antecedent government can be blocked in two ways: (a) by an intervening barrier (XP) is a barrier if it is not directly selected by an X^0 not distinct from [+V]; (b) by an intervening governor of the same type. In (ii) VP is not a barrier, being directly selected by I^0 (which is not distinct from [+V]). Furthermore, antecedent government is not blocked, since there is no intervening governing potential A-binder. Hence, the coindexation in (iia) can count as an A-chain without further intermediate coindexation.

In many cases the two approaches yield identical empirical results, but the precise range of Rizzi's approach is not equally clear in all domains of application. A case of potential difference is chains into PPs, which we mention in footnote 45.

³³ The major original reason why anaphora chains and NP-movement chains are currently not viewed as both falling under chain theory is that the standard Chain Condition is viewed as feeding the ECP. To take the simplest example, we would not like to allow (ia) as a legitimate derivation.

- (i) a. **Felix_i*, fired *e_i*.
- b. *Felix_i*, fired himself_i.

To capture this, the Chain Condition in (ii) (from Chomsky 1986a,b; assumed also in Rizzi 1990) is viewed as a definitional condition, determining what counts as an A-chain.

- (ii) A maximal A-chain ($\alpha_1, \dots, \alpha_n$) has exactly one Case-marked position— α_1 —and exactly one θ-marked position— α_n .

A coindexation string not meeting this condition is not a chain. Hence, if one of its links is an empty category, it is not antecedent-governed, and the string is ruled out by the ECP. Thus, (ii) defines both sequences of (i) as nonchains, since they each have more than one θ-marked position. This has no effect on (ib), but in the case of (ia) the empty node violates the ECP. (ii) must be viewed as a definitional condition, rather than a well-formedness condition; otherwise, it would also rule out the anaphor in (ib).

In Reuland and Reinhart 1992 we argue that (ia), as well as other cases originally motivating the θ-restriction in (ii), is also ruled out without it. The argument for (i) is summarized in footnote 42. Under our reformulation of (ii) it will be a well-formedness condition.

details aside, the conceptual basis for this formulation is the assumption that an A-chain necessarily forms one semantic argument. This cannot be maintained, in any obvious way, for anaphor chains such as the one in (77b). The generalization observed in (76)–(78) then happens to have no theoretical status under this implementation, and the ill-formed coindexations in (76c–d) and (77c–d) must be ruled out independently by the (standard) binding conditions.³⁴ However, we argue that, in fact, all the (well-formed) chains above can be viewed as forming one syntactic argument, which does not necessarily mean that they must form one semantic argument. The generalization observed in (76)–(78) will follow, then, from (a slightly modified formulation of) the Chain Condition.

6.2.1 The Syntactic (Case) Requirement on A-Chains Let us check, first, what the well-formed A-chains in (76)–(78) have in common, in terms of our initial R property. Recall that we assume this property to hold for the R-expressions of the GB framework (that is, full NPs), as well as for pronouns, including PRO and pro. As in GB, wh-traces are defined as +R, and we turn directly to the question of what R could mean in this case. Looking at the R properties of the well-formed chains ((a) and (b) of (76)–(78)), we see that they contain exactly one +R link, which is their head. Both the tail and any intermediate links of a well-formed chain are –R: either an anaphor or an NP-trace (whose similar status was previously captured, to begin with, by defining NP-traces as anaphors). In the ungrammatical chains of (c) and (d), by contrast, the tail is +R: a pronoun or a wh-trace. The head of a well-formed chain must be a +R link. Although –R NPs like anaphors or NP-traces can serve as an intermediate link in a chain, as in (78), repeated here, they cannot head a chain, as for example, in the embedded CP of (79).³⁵

- (78) a. *Felix_i*, was expected [*t_i* to consider [himself_i smart]].
- b. *Felix_i*, expects [himself_i to be considered [*t_i* smart]].
- (79) a. **Maria_i*, expected [_{CP} that [_{IP} herself_i would be praised *t_i*]].
- b. **Felix_i*, seems that [_{CP} it appears [_{IP} *t_i* to be attacked *t_i*]].

The descriptive generalization is then that an A-chain is headed by its unique +R NP. Let us incorporate this into the (Case clause) of the standard Chain Condition, in (80). (This differs from the standard formulation of that clause only in also mentioning the property R and omitting reference to θ; see footnote 33 for the original formulation.)

³⁴ As shown in section 6.1, these specific examples cannot be ruled out by our Condition B. In (76) this is so because the predicate is intrinsically reflexive, and in (77) because the two links of the chain are not coarguments.

³⁵ The coindexation across the embedded CP here does not form an A-chain, but the embedded CP contains an A-chain headed by an R-deficient NP. (79b) is ruled out independently by the ECP, but in our framework, unlike in the standard binding theory, the binding conditions do not block (79a), since Condition A is technically met. (The syntactic coarguments of *praise* are coindexed, and Condition A is insensitive to hierarchical considerations.)

Other advantages of using this version of the Chain Condition are discussed in Reuland and Reinhart 1992, forthcoming.³⁶

(80) *General condition on A-chains*

A maximal A-chain ($\alpha_1, \dots, \alpha_n$) contains exactly one link— α_1 —that is both +R and Case-marked.

Under this formulation of the Chain Condition, it is equally respected by both NP-movement chains and anaphor chains. Assuming that in a chain like (76b) *Felix_i behaved himself_i*, the anaphor is Case-marked (which is not obvious, as is hinted at directly), it is still a −R link. Thus, the chain appropriately contains only one link—*Felix_i*—which is both +R and Case-marked. By contrast, in (76c), **Felix_i behaved him_i*, both links are +R and Case-marked. We take (80) to be a standard well-formedness condition. Thus, it rules out as ungrammatical the coindexations in (76c–d) and (77c–d), as well as the cases in (79).³⁷ Recall that the A-chain domain of a given NP is a subdomain of its c-command domain. Given (80), the referentially independent element of the chain must therefore c-command the referentially dependent element. For example, the chain in **Himself_i praised Felix_i* violates (80), since it is headed by a −R link. (Its unique +R and Case-marked link—*Felix_i*—is at the tail rather than at the head of the chain.) In section 8 we will argue that the apparent configurational effects of the binding conditions can all be reduced to this Chain Condition.

The properties R(eferrential independence) and Case may seem strange bedfellows when it comes to such a clear instance of a purely syntactic sentence-level principle as the Chain Condition. To see what may be their relation, we should focus on what R could really mean. In the case of pronouns, it makes intuitive sense to argue that they are referentially independent, since they can be used to select a value directly in the discourse. But in the case of wh-traces, which are interpreted as variables, this is not so. So whereas the distinction between pronouns and anaphors can perhaps be stated in terms borrowed from the theory of reference, the same terms are not particularly

³⁶ If +R means being fully specified for structural Case (where structural Case may eventually turn out to be among the φ-features), we predict that some languages may contain −R-expressions that are −R for lack of structural Case. Frisian turns out to be such a language. Frisian lacks SE anaphors that are φ-feature-deficient (in this, it is reminiscent of older stages of English). Instead, it has a pronominal paradigm that in some respects distinguishes between structural and oblique Case (J. Hoekstra 1991). In all positions where Dutch allows or requires *zich*, Frisian has a pronominal form, but it cannot be the one marked for structural Case. Thus, (i) is parallel to (71) and (ii) is parallel to (75) (note that both forms are pronominal).

- (i) *Marie_i skammet har_i/*se_i*.
Marie_i shamed her_i
- (ii) *Marie_i hearde [har_i/*se_i] sjongen*.
Marie_i heard [her_i] sing

Space reasons prevent us from discussing this fully here. For a more extensive presentation of the facts and the theoretical issues involved, see Reuland and Reinhart, forthcoming.

³⁷ The shift from a definitional condition to a well-formedness condition entails that some cases ruled out before by the ECP will now be ruled out as illicit chains. However, in terms of expressive power, we do not see a difference between assuming a specific definitional condition that enables such structures to be ruled out by the ECP or a well-formedness condition ruling them out directly.

illuminating in distinguishing wh-traces from NP-traces.³⁸ In the long run, we would assume that, in fact, the relations between syntax and reference go the other way around than their informal discussion in syntactic research seems to suggest. It is not the case that referential properties of NPs miraculously restrict their syntactic behavior; rather, some independent syntactic properties of NPs determine how they can be used to refer. Thus, R should be a purely syntactic property. Having this property is a necessary condition for an expression to function as an independent argument, but R itself does not have anything to do with reference. What could it be? A general property of both SE and SELF anaphors is that they do not have a full specification for structural Case. Even in languages where they can show the full variety of inherent Case (e.g., Russian, Icelandic), they are not found with nominative Case. While in most structures this may be argued to follow from the (standard) binding theory, Everaert (1990) shows that the two are independent. In the Icelandic sentences he analyzes, a VP-internal nominative anaphor could have been bound from the subject position, but it is still excluded.

We have already assumed in section I (following Chomsky 1981) that a full specification of φ-features is a requirement for an NP to project an argument. Suppose, then, that this is extended to structural Case; that is, suppose that the full specification for structural Case is among the φ-features (which would be trivial to do in a theory assuming Case checking, rather than Case assignment). The property R becomes superfluous, but it could still be useful as a label for the NP set defined in (81).³⁹

(81) An NP is +R iff it carries a full specification for φ-features and structural Case.

(Note that we are talking about the internal specification of an NP for Case, rather than about the Case actually realized in a specific syntactic environment.) Under this view, the Chain Condition licenses a chain iff (a) the head link, which defines its argument status, and only the head link, is fully specified for Case and (b) its Case is realized (or

³⁸ Note that it is crucial in our framework to define wh-traces as +R. Recall that we are working in a framework with no Condition C. Hence, strong crossover, as in (76d) and (77d), is not ruled out independently by any other binding condition (except for the same translation procedure that also rules out weak crossover; see Grodzinsky and Reinhart 1993). Given the Chain Condition in (80), it may be possible to show that all instances of strong crossover are ruled out just as chain violations, since one of the intermediate traces of the moved wh-constituent will always form a chain with the binding pronoun.

³⁹ Kissock (1993) observes that anaphors in Telugu have a full Case paradigm, including nominative Case. On the basis of what we have said so far, a nominative element may be −R if it is underspecified for φ-features in another dimension. (In addition, in order for there to be a well-formed chain, the projection in which it receives Case should not be a barrier.) Whereas on the one hand the Telugu anaphors do show a certain φ-feature deficiency, on the other hand the nominative anaphor can be discourse-bound and does not obviously tail a chain. The full range of facts requires further investigation.

Note furthermore that possessive anaphors, which we do not discuss in this article, generally do allow all Case forms. However, such anaphors are internally unspecified (for Case and other φ-features), since they depend for these on the noun they modify.

For more discussion of the relation between Case and the R property, see Reuland and Reinhart, forthcoming.

checked).⁴⁰ Assuming that only Case-marked, fully specified NPs project a syntactic argument, the Chain Condition has the effect of requiring that an A-chain project a single syntactic argument.

6.2.2 The Semantic (θ -) Requirement on A-Chains We described the A-chain domain as the domain in which two coindexed positions project one syntactic argument and may also be interpreted as one semantic (θ -) argument. But, as we mentioned, in the current implementation of chain theory a stronger stand is often assumed, namely, that in an A-chain this must (not only may) be the case. This is captured by the full version of the Chain Condition in (82), which is based on the formulation in Chomsky 1986a (assumed also in Rizzi 1990), except that it incorporates the change we introduced in (80).

- (82) A maximal A-chain ($\alpha_1, \dots, \alpha_n$) has
- a. exactly one link— α_1 , which is both +R and marked for structural Case—and
 - b. exactly one θ -marked link.

Conceptually, (82b) is based on the view that if A-chains are just a single argument, they should be indistinguishable from other arguments (viewed as a single-membered chain) in also only allowing one θ -role. This indeed appears to always be the case with (well-formed) NP-movement chains. For example, a (simplified) plausible logical representation for *Felix was fired t* is $\exists x (x \text{ fired } \text{Felix})$. Similarly, *Felix was expected [t to be considered [t smart]]* corresponds to $\exists x \exists y (x \text{ expects } y \text{ to consider } \text{Felix} \text{ smart})$. (See, for example, Chierchia 1989 for a formal analysis of the derivation of such representations.) The two coindexed positions in the first case, and the three in the second, thus correspond to just the one argument—*Felix*—in the semantic representation of the sentence.⁴¹ On this view, the anaphora coindexation structures we have been considering do not, in fact, constitute A-chains, since they do not meet the requirement (82b). ((82) is on that view a definition, rather than a well-formedness condition. See footnote 33 for the technical details.)

However, Fox (1993) observes that it is possible, in principle, to maintain the θ -requirement for anaphoric A-chains as well. In one case—that of intrinsically reflexive predicates (such as *Felix behaved himself*)—it is anyway assumed that the predicate contains only one θ -role, since intrinsic reflexivization is an operation on the verb's grid, which reduces, or absorbs, one of its roles. In this case it is therefore clear that the anaphor occupies a syntactic position that does not correspond to a thematic position,

⁴⁰ Empty nodes are specified for Case if they are \bar{A} -bound (*wh*-traces), but not otherwise. Given this view of the R property, it could be the case that the Chain Condition requires only that a chain have a unique +R head link, which is the minimum requirement for projecting an argument. However, there is still some technical work to be done, in order to show that this would capture everything that the current condition does. We therefore leave this option open here.

⁴¹ In the case of raising, as in *Felix seems t to be tired*, Chierchia argues that *seem* is interpreted as a function on the proposition interpretation of *Felix to be tired*. Here too, the chain corresponds to one semantic argument.

so the chain contains only one θ -position, in accordance with (82b). Since it also contains only one +R Case-marked link in its head position, it is a well-formed A-chain. It is possible to extend the same analysis to predicates reflexive-marked by a SELF anaphor. In fact, as mentioned in section 1, in Keenan's (e.g., 1987) analysis of reflexivization, SELF is an operator that turns a transitive predicate into an intransitive one; that is, it reduces the predicate's grid in just the same way that the intrinsic reflexive operator does. (Roughly, *Lucie praised herself* is analyzed as $(R(\text{praise}))(\text{Lucie})$, which is equivalent, by definition, to $\text{Lucie} (\lambda x(x \text{ praised } x))$.) On this view, reflexive marking means that a role-reducing operator is active in the predicate. With this assumed, as long as a predicate is reflexive-marked, coindexing its syntactic arguments yields a chain that satisfies (82b), and if it also satisfies the R requirement in (82a), the result is a well-formed chain.

Problems arise, though, in the case of ECM subjects. First, it is not clear that role reduction can be assumed to have taken place in (83). In any case, it cannot be assumed for (84a), where no SELF operator is present. As we showed in the discussion of (75), repeated in (84), in these structures reflexive marking is not required by Condition B (since the coindexed links are not coarguments). Still, only SE, not a pronoun, can occur in that position. (84b) must therefore be ruled out by the Chain Condition. Indeed, (84b) violates the R requirement (82a), whereas (84a) obeys it. But if these anaphoric chains must also obey the θ -requirement (82b), then both derivations should be ruled out.

- (83) Jan, heard [himself, sing].
 (84) a. Jan, hoorde [zich, zingen].
 Jan heard [SE sing]
 b. *Jan, hoorde [hem, zingen].
 Jan heard [him, sing]

To solve this problem, Fox (1993) proposes that the θ -requirement (82b) be relativized to a θ -assigner, as in (85).

- (85) A maximal A-chain ($\alpha_1, \dots, \alpha_n$) has exactly one θ -marked link per θ -assigner.

On this formulation the chains in (83)–(84) all observe the θ -requirement (since in these chains there are two θ -assigners, and, accordingly, two θ -marked links). But (84b) is ruled out, since it violates the R requirement (82a).

Though it is technically possible to maintain the θ -requirement on A-chains, it should be noted that whether it is correct in the first place has been a subject of much debate. In the basic cases of A-chains of the type we considered here, this requirement does not play any independent empirical role. In all these cases, the chain has exactly one θ -position, since there is exactly one θ -role to be assigned: in the case of raising, the matrix verb (like *seem*) does not have a role to assign. In the case of passive, an existential operator reduces, or absorbs, the agent role (see, again, Chierchia 1989 for the technical details). In the case of intrinsic reflexivization, the reflexive operator detransitivizes the

verb. For these basic cases, then, incorporating the θ-requirement into the Chain Condition is motivated only by conceptual rather than empirical reasons. In Reuland and Reinhart 1992, forthcoming, we argue in detail that the syntactic considerations that originally motivated this θ-Condition all fall out from independent components of the theory.⁴²

The empirical controversy regarding the θ-requirement revolves around chains that combine two moved NPs or an NP-trace and an anaphor, as in (86)–(87).

- (86) *Gianni, si, t_1 sembra [e, non fare il suo dovere].
 Gianni (to) himself seems not to do his duty
- (87) a. Lucie, strikes herself, [t_1 as clever].
 b. Lucie seems to herself [t to be beyond suspicion].

Rizzi (1986) argues that the Italian (86) illustrates the correctness of (what was at the time his equivalent formulation of the present) θ-requirement (82b). Since the trace of the moved clitic and the trace of the raised NP are both θ-marked, (82b) rules this derivation out. However, Chomsky (1986b) compares this sentence to the English cases of (87). Assuming (correctly, we believe) that the anaphor c-commands the trace in both cases, an A-chain is formed in both cases of (87), which violates (82b) in just the same way as (86). Nevertheless, the derivations are well formed. In Reuland and Reinhart, forthcoming, we provide further reasons to assume that (82b) yields the wrong results for chains of this sort.⁴³

⁴² For illustration, consider how (i) is ruled out independently of (82b). Three types of empty elements are relevant here: PRO, pro, and Case-marked NP-trace. Since PRO and pro are Case-marked NPs and +R, a chain containing PRO or pro in any but its head position violates (82a).

- (i) *Felix fired e.
 +Case +Case
 +θ +θ

This leaves us with the option that the structure arose by movement of *Felix*, leaving a Case-marked NP-trace, in which case (82a) is not violated (the trace being –R). Note, first, that under the current developments of syntactic theory (Chomsky 1991, 1992), A-movement from a Case-marked position will violate economy; hence, ruling out this case is no longer a task of chain theory. However, even in the earlier framework, independent considerations will rule it out. Consider an NP-trace position a_k in some chain. Movement from a_k to an A-position a_j requires the latter to be empty at D-Structure. Consequently, a_j must be a non-θ-position. A D-Structure A-position is only a non-θ-position if its θ-role has been absorbed in accordance with Burzio's Generalization. That is, the predicate projecting a_j is unable to assign objective Case to some argument it governs. If the Caseless argument is in fact a_k , this is Q.E.D.; if a_k is the moved argument, but the Caseless position is another one, say a_i , the latter must be an argument-EG (pro or PRO). It is either unlicensed (unidentified, or inappropriately governed) and hence ruled out, or coindexed with a_k , violating (82a).

⁴³ The issue concerning the status of (82b) in our system vis-à-vis Rizzi's approach to chains was brought up by an *L1* reviewer. The reviewer suggested that we might have a problem with argument shift, for which Rizzi's system might be better equipped, the assumption being that one can never A-move a direct object across an indirect object and have it antecede a reflexive indirect object. Dutch double object constructions provide counter-evidence to this claim of a similar kind as (87). Dutch allows passivization of the accusative object over the dative one, as in (ib) (in fact, this is the only option, as illustrated in (ic)). (id) shows that crossing an intermediate anaphor is permitted, although the resulting chain will contain two θ-roles, contra (82b).

- (i) a. Lucie toonde de toeschouwers een man.
 Lucie showed the spectators-DAT a man-ACC

The least we could conclude is that no sufficient reasons have been provided to believe that (82b) is the correct generalization. The empirical evidence we have so far argues against it, both in the cases like those above and in the cases of anaphora that we will come to.⁴⁴ Therefore, we take the alternative line here, assuming that this requirement is not part of chain theory. Rather, we assume the Chain Condition as stated in (80) (repeated in clause (a) of (82)). This decision is substantiated with greater detail in Reuland and Reinhart, forthcoming.

The view of A-chains we assume, then, is the one we started our discussion with. Under our analysis, an A-chain is one argument in a syntactic rather than a semantic sense: it contains exactly one link that can project an independent syntactic argument (a Case-marked +R NP). It is this property that enables an A-chain in many cases to be interpreted also as one semantic argument, since a necessary (though not a sufficient) condition for this to be possible is that the two positions could count as one syntactic argument. However, whether a given A-chain corresponds in effect to one or more semantic arguments depends not on the Chain Condition, but on independent consid-

- b. Een man, werd de toeschouwers t_1 getoond.
 a man-NOM was the spectators-DAT t_1 shown
 c. *De toeschouwers, werden t_1 een man getoond.
 the spectators-NOM were t_1 a man-ACC shown
 d. De man, werd zichzelf, t_1 getoond.
 the man-NOM was himself-DAT t_1 shown
 e. Der Mann, wurde sichselbst, t_1 gezeigt. (or, perhaps: Der Mann, wurde t_1 sichselbst, gezeigt.)
 the man was himself shown

German has a prima facie similar pattern; see the German equivalent in (ie) (thanks to Ellen Brandner for discussion). Although the literature contains some arguments to the effect that perhaps the German equivalent of (id)—(ie)—does not involve crossing, Den Dikken (1992) shows that such arguments do not carry over to Dutch. Further investigation of such phenomena in, for example, Hindi will be left for the future. (Note that if in some language argument shift is A-movement, which leaves a variable, the ungrammaticality of crossing will directly follow from the Chain Condition.)

Furthermore, to us it seems that (86) and (87) are not equivalent, and that the problem in (86) is due not to the Chain Condition but to the improper use of the clitic: as an element affecting the argument structure of the verb it attaches to (either absorbing an argument or marking the verb lexically reflexive), it is incompatible with the argument structure of *sembrare*. It cannot absorb an argument (neither the external argument, since there is none to begin with, nor the internal argument, since the latter is realized as the embedded IP by assumption), nor can the predicate of *sembrare* be lexically reflexive (with respect to subject and object), since this presupposes the presence of an argument in its lexical structure where by definition it cannot have one. For this case, therefore, (82b) is not needed. Rizzi also discusses crossing in double object constructions. However, as he himself notes, in this case the judgments are variable, and generally much less strong than in the passive and raising cases. It seems doubtful to us that they could provide substantial support for (82b).

⁴⁴ In section 6.3 we argue that pure Condition B effects are much weaker than violations of the more syntactic Chain Condition. If we assume (82b), the overlap between our Condition B and the Chain Condition will be much greater than it is now. Under our current analysis, (ib) is ruled out both by Condition B and by the (R-clause of) the Chain Condition, but (ia) violates only Condition B. If (82b) is assumed, it would turn out that (ia) is also ruled out by the Chain Condition, since given that no role-reducing operator is present, the chain has two θ-roles.

- (i) a. *Max, critiseerde zich.
 b. **Max, critiseerde hem.

However, it can be observed that the violation in (ia) is much weaker than the one in (ib), and it patterns with the judgments on cases that are ruled out only by Condition B.

erations of the thematic structure of its predicate(s). The Chain Condition (80) is our present implementation of the (presently irreducible) requirement that coindexation within the A-chain domain is permitted only if the result is one syntactic argument.

Another change we must assume in the standard chain theory is prohibiting (80) from applying to single-member chains. This change is needed in order to allow for the logophoric use of anaphors. Otherwise, each occurrence of a logophor, as for example in *Max praised Lucie and himself* or *Max saw a picture of himself*, would end up violating (80). (The anaphor *here* does not form a chain with its antecedent. If it counts as a chain alone, then the chain is inappropriately headed by a $-R$ expression.) This is only a matter of definition, so there are two options: either we define (80) as a condition on chains with more than one link, or we define an A-chain as consisting of at least two coindexed links. Given that we no longer assume that a chain cannot have more than one θ -role, either option is no longer a significant move.

6.3 The Interaction of Condition B and the Chain Condition

Under our analysis, it follows that SE anaphors are governed only by Condition B, since, being $-R$, when they occur at the tail of a chain, they never violate the Chain Condition (80). But pronouns, being $+R$, are also subject to the Chain Condition. This means that the task of ruling out pronominal anaphora is divided between Condition B and the Chain Condition. In the simplest contexts of pronominal anaphora, the effects of the two conditions may be indistinguishable. For example, in (88a) coindexation ends up being ruled out twice: by Condition B, and by the Chain Condition (as involving a chain tailed by a $+R$ expression). In the PP contexts discussed in sections 2.2 and 5.3, such as (88b), both conditions equally allow the pronoun.⁴⁵

- (88) a. *Felix₁ fired him₁.
- b. Felix₁ found a gun next to him₁.

Nevertheless, the two conditions are far from being redundant, since there are many other contexts where anaphora is ruled out by the one and not by the other. Furthermore, once the two are isolated, it will become apparent that constructions that violate the Chain Condition are worse than those that violate only Condition B. Let us start with cases ruled out only by the Chain Condition.

The problems we started with in section 6.1 all involve coindexation that is allowed by Condition B, as witnessed by the fact that a SE anaphor is allowed. But a pronoun

⁴⁵ We have already shown in detail why Condition B does not apply. More attention is needed to why the Chain Condition does not rule out the pronoun *here*: the preposition *next* has its strict lexical meaning; allowed, it is not obligatory. Given the framework of Chomsky 1986a, an independent P is a Minimality barrier; hence, the pronoun does not form a chain with the antecedent. So, at least one LF representation corresponds to a well-formed S-Structure representation. It is less clear why there is no chain *here* under Rizzi's (1990) analysis (although his discussion (appendix 2) may well provide the means to draw the necessary distinctions). So this is the only case we know of where the two approaches may make different predictions. (See footnote 32 on the definition of barriers.)

in the same position is excluded by the Chain Condition:

- (89) a. Willem₁ schaamt zich₁.
Willem shames SE
- b. *Willem₁ schaamt hem₁.
Willem shames him
- c. Lucie behaved herself/*her (well).
- d. Lucie gedroeg zich/*haar (goed).

The verbs in (89), which repeats (71) and (72a), are intrinsically reflexive; hence, Condition B is met. As we have argued, the coindexation in all these cases forms an A-chain and is thus subject to the well-formedness condition (80). (89a) contains only one $+R$ expression, *Willem*, in its head position, the tail being a $-R$ anaphor. Hence, it is well formed. (89b), however, contains a second $+R$ expression, namely, the pronominal *hem*. Therefore, it violates (80). The same is true for the English (89c). If a pronoun is used rather than an anaphor, an illicit chain is formed. The difference between (89c) and (89d) is that English, unlike Dutch, has no SE anaphors. As a consequence, the only element to satisfy the Chain Condition is the SELF anaphor, which is $-R$.

In the cases of (73) and (74), repeated in (90), the predicate is defined as reflexive, although the verb is not intrinsically reflexive, because one of its arguments is a SELF anaphor. Consequently, Condition B allows all derivations.

- (90) a. *He₁ assigned him₁ to himself₁.
- b. *Henk₁ wees hem₁ aan zichzelf₁, toe.
Henk assigned him to himself
- c. Henk₁ wees zich₁ aan zichzelf₁, toe.
Henk assigned SE to himself

However, here too a chain is formed, so the Chain Condition rules out (90a) and (90b), where the pronoun is an illicit $+R$ link in a nonhead position of a chain. That anaphora *here* is ruled out by the Chain Condition and not by Condition B is witnessed again by the fact that in the Dutch (90c), SE can occur.

Differences between Chain Condition effects and Condition B effects do not only show up in cases where the predicate is independently marked reflexive, as above. Another source for their difference is the fact that Condition B applies to semantic predicates, whereas the Chain Condition applies to syntactic representations (including LF). Hence, whenever the links of an A-chain are not coarguments semantically, only the Chain Condition can rule out anaphora. One such context is the ECM structures of (75b–c), repeated in (91).

- (91) Jan₁ hoorde [zich₁/*hem₁ zingen].
Jan heard [SE₁/*him₁ sing]

This is a prototypical chain environment, which was also viewed as a Condition B environment by the standard binding theory. On that view, it is a complete mystery why

a SE pronoun can occur here (see the full pattern in (75)). For our analysis, this follows, since the pronoun and its antecedent are not semantic coarguments, and Condition B is satisfied. The Chain Condition, however, is indifferent to Condition B, and it rules out the case of the pronoun, as an illicit +R tail.

Raising predicates are another case where a syntactic chain does not correspond to a semantic predicate:

- (92) a. *Lucie₁* strikes *herself₁*/**her₁* [*t₁* as clever].
- b. *Lucie₁* seems to *herself₁*/**her₁* [*t₁* to be beyond suspicion].
- c. *We₂* strike *me₁* [*t₂* as less happy than *we* used to be].
- d. **We* promised *me* [PRO to be more happy than *we* used to be].

Assuming that *herself* is an argument of the raising verb, *Lucie* and *herself* are still not coarguments of the same semantic predicate. Hence, Condition B cannot apply.⁴⁶ However, as noted in the discussion of these cases in (87), the coindexation in (92a–b) forms an A-chain, with the anaphor or the pronoun as an intermediate link. Hence, the pronoun chain is ruled out by the Chain Condition. That it must be the Chain Condition that is at work here, rather than Condition B, is witnessed by (92c). *We* and *me* are not coindexed here; that is, they do not form a chain. Such instances of anaphora can only be ruled out by Condition B, at the stage of translating into distributive predicates. But at the point of translation, no reflexive predicate is formed. This contrasts, for example, with (92d), where *we* and *me* are semantic coarguments, and which is ruled out by Condition B.

So far we have examined cases of pronominal anaphora that are ruled out by the Chain Condition alone. Next we turn to the cases ruled out only by Condition B. As already noted, this is always the case with SE-pronominal anaphors, which cannot, by definition, violate the Chain Condition. The fact that such –R expressions do not exist in English made it easier to overlook the distinction between Condition B effects and Chain Condition effects, in the history of the binding theory. However, once the distinction is made, it is easy to observe that in the case of +R pronouns as well, there are anaphoric contexts ruled out by Condition B alone. In these contexts, the distinction is also visible in English.

The areas to look at are again those in which semantic predicates do not correspond precisely to syntactic ones. As we demonstrated in detail in section 5, this is the case with P and N predicates. Two of the examples given there are repeated here:

- (93) a. *Lucie* saw a picture of her.
- b. **Lucie₁* took a [picture of *her₁*].
- c. *Max₁* rolled the carpet [over *him₁*].
- d. **Max* rolled the carpet₂ [over *it₂*].

⁴⁶ Thanks to Jacqueline Guéron (personal communication) for pointing this interesting case out to us.

Assuming that there is no PRO in NPs of the type in (93a–b) (see the discussion of (53)), there can be no chain in (93b), hence no violation of the Chain Condition. However, the agent role of *picture*, which is not realized syntactically, is still controlled by *Lucie*. Hence, in the semantic translation, a reflexive predicate is formed, which is ruled out by Condition B. Similarly, we argued that Condition B blocks the pronoun in the PP in (93d), since the implicit argument of the semantic predicate *over* is controlled by its antecedent. Recall that we argued that a small clause analysis does not work for such cases, so their syntax is as represented in (93c–d). In this case as well, an A-chain cannot be assumed (see footnote 45), so anaphora is ruled out only by Condition B.

Even clearer cases where pronominal anaphora can only be ruled out by Condition B are those of conjoined distributive anaphora:

- (94) a. **Max₁* criticized *Lucie* and *him₁*.
- b. **We* voted for *me*.

As discussed in section 4, these cases are ruled out by Condition B, since under the distributive reading an unmarked reflexive predicate is formed in the semantics. The Chain Condition cannot be relevant here: the constituent *Lucie and him₁* in (94a) does not as a whole carry the index 1. Hence, a chain link is not formed here, nor can *him* alone enter a chain relation with the subject. This is even clearer in (94b), where there is no syntactic coindexing between *we* and *me*, and hence no chain. Therefore, anaphora in both cases is ruled out only by Condition B.

Conjoined anaphora of this type can therefore be used as a diagnostic test for the precise scope of Condition B. For example, we claimed that for Condition B to be met, it is sufficient that one of the arguments of the predicate is a SELF anaphor. Additional arguments can then be coindexed with no SELF marking, as long as this is allowed by the Chain Condition. This was checked above with a SE anaphor, in (90), but the same can now be observed for conjoined anaphora in English, although the judgments may be subtle:⁴⁷

⁴⁷ However, as pointed out by an *LI* reviewer, the judgments on the relevant sentences are not always as clear-cut as our analysis predicts. For example, our analysis entails that under a distributive reading (ib) is better than (ia) or (ic), for the same reason that applies to (95)–(96), and that (ii) is fine.

- (i) Looking at the family album,
- a. **Max₁* pointed *Lili* out to *Lucie* and *him₁*.
- b. ?*Max₁* pointed himself₁ out to *Lucie* and *him₁*.
- c. **Max₁* pointed himself₁ out to *him₁*.

- (ii) Why should I devote myself to just you or me, when there is the whole world to think about?

Although quite a few speakers have difficulty getting clear judgments on sentences of the type in (i), we found that whenever a distributive (rather than a collective) reading was obtained, a contrast along the lines of (i) was present. This is further illustrated by the following contrast in Dutch:

- (iii) Bij het maken van de tafelschikking,
while making the table arrangements,
- a. *wees ik per ongeluk (aan) *Max₁*, *Lucie* en *hem₁*; toe.
 assigned I accidentally (to) Max₁, Lucie and him₁;
 'I accidentally assigned (to) Max Lucie and him.'

- (95) a. *I can't imagine you denouncing you or me.
 b. I can't imagine myself denouncing you or me.
 c. *I can't imagine myself denouncing me.
- (96) a. *D'you remember how I caught you tickling Lucie and you when you got drunk?
 b. D'you remember how you caught yourself tickling Lucie and you when you got drunk?
 c. *D'you remember how you caught yourself tickling you when you got drunk?

Focusing on the embedded predicates, the (a) and (b) cases differ in that in the latter the predicate is defined as reflexive-marked by its subject anaphor. As far as Condition B is concerned, then, anaphora is permitted in the (b) cases, but blocked in the (a) cases. In neither the (a) nor the (b) cases does the pronoun form a chain with its antecedent; hence, only Condition B is relevant here. In the (c) cases, by contrast, the Chain Condition prohibits coindexation, although Condition B is still observed.

We may note, now, that the starred sentences in (93)–(96) are all substantially less bad than the starred pronominal cases in the previous set. Again, this is not just the case with pronouns. Generally, Condition B violations are weaker than violations of the Chain Condition, and precisely the same is found with SE anaphors:

- (97) Willem₁ bewondert zichzelf₁/*zich₁/**hem₁.
 Willem₁ admires himself₁/*SE₁/**him₁

The verb in (97) is not inherently reflexive; hence, the object argument must be SELF-marked. If the object is *zich*, the Chain Condition is respected, but Condition B still rules the sentence out. If the object is *hem*, not only Condition B is violated, but the Chain Condition as well. Indeed, the sentence *Willem₁ bewondert hem₁ is substantially worse than *Willem₁ bewondert zich₁, on which Dutch speakers tend to be much less decisive, in a way reminiscent of the varying judgments of English speakers on, say (96). A sentence violating only the Chain Condition, like *Willem₁ schaamt hem₁ or *Willem₁

- b. ?wees Max₁ per ongeluk (aan) zichzelf₁ Lucie en hem₁ toe.
 assigned Max₁ accidentally (to) himself₁ Lucie and him₁
 'Max accidentally assigned (to) himself Lucie and him.'
- c. *wees Max₁ per ongeluk (aan) zichzelf₁ hem₁ toe.
 assigned Max₁ accidentally (to) himself₁ him₁
 'Max accidentally assigned (to) himself him.'

The nature of the variation that we observed among speakers and sentence types indicates that the judgments involve more factors than just binding and chain theory.

A further case to consider in this context is (iv), where at the interpretation stage both predicates are reflexive, but only (ivb) is reflexive-marked.

- (iv) a. ??Perhaps we could reintroduce me to Max?
 b. Perhaps we could reintroduce me to myself?

gedraagt hem₁, remains just as bad as sentences violating both: adding a minor violation to a dramatic one can hardly be expected to be noticeable.⁴⁸

It seems safe to conclude that the Chain Condition and Condition B are clearly distinct, yielding different results in different contexts, and different degrees of grammaticality. Neither of them can be reduced to the other.

7 On the Subject of Nonfinite Clauses

7.1 ECM and Raising Structures

The subject of ECM and small clauses is defined (by (40)) as a syntactic argument of the matrix verb, since it is assigned its Case by the latter. This entails that an anaphor in this position reflexive-marks the matrix predicate. Hence, an anaphor cannot be logophoric in this position, as in (98).

- (98) *Lucie thought that Max saw [herself talk to herself].

In (99) and (100), then, *himself* and *Max* are coarguments of the matrix (reflexive-marked) syntactic predicates.

- (99) Max heard [himself criticize Lucie].

- (100) Max expects [himself to pass the exam].

Condition A is met for these (matrix) predicates, since the two arguments are coindexed. The problem, however, is that *himself* is also a syntactic argument of the embedded predicate, and hence it reflexive-marks that predicate as well. This appears to be a Condition A violation, since the lower predicate is not reflexive. To see what may be involved here, let us look at the Dutch translation of (99), in (101).

- (101) . . . dat [IP Max₁ [IP zichzelf₁ Lucie t₁] [v₁ hoorde, critiseren₁]]
 that [Max [himself Lucie t₁] heard criticize]

The S-Structure form (101) is derived by V-raising of the lower V, *critiseren*, and adjoining it to the matrix V, *horen* 'hear'. In this structure, Condition A is satisfied with no further stipulation. The ECM subject—*zichzelf*—is no longer an argument of the

⁴⁸ Although, perhaps due to dialectal variation (see footnote 36), some speakers observe a difference here as well.

Another way to check the relative judgments is to compare basic cases like the following:

- (i) a. **Felix praised him.
 b. Felix praised himself.
 (ii) a. *Felix praised Lucie and him.
 b. Felix praised Lucie and himself.
 (iii) **Felix expects [him to win].

(iii) is less bad than (ia); moreover, the contrast between (ia) and (ib) is much greater than that between (iia) and (iib). If a sentence violates only the Chain Condition, as in (iii), it remains just as bad as if it violates both, as in (ia).

raised verb here: recall that we assumed in section 4, as is standard, that the VP rather than the V assigns the external argument. The subject is thus never a θ-argument of V_i , but it is included as an argument by definition. In (101) the anaphor is no longer the external subject of *critiseren*, so regardless of whether *critiseren* forms a syntactic predicate at all here, the anaphor cannot reflexive-mark it. By contrast, *zichzelf* is still a syntactic (Case) argument of the new complex predicate: this predicate preserves the properties of the original matrix predicate (as illustrated by the V-indexing in (101)), so it is the Case assigner of the anaphor. As before, the anaphor is appropriately coindexed with the external argument of this predicate, so Condition A is met.

The same operation of V-raising can be found in a great variety of languages (see Baker 1988 for many examples of non-Indo-European languages; but see also the extensive literature on Dutch, for example, Evers 1975, Reuland 1983, Rutten 1991, where V-raising, which includes the infinitival inflection, is obligatory when the complement subject is licensed by the matrix predicate). Since this is an operation permitted by Universal Grammar, it must be available also at LF in English. Among the LF derivations of the English (99)–(100), then, we find (102)–(103).

- (102) Max [criticize_i-hear_j] [himself_i t_i; Lucie]
- (103) Max [to-pass_i-expect_j] [himself_i t_i; the exam]

Condition A is satisfied here in precisely the same way as it is in (101). (Derivations where this did not happen will be filtered out by Condition A.)

Following Chomsky (e.g., Chomsky 1991), we assume that both LF raising (as in (102)–(103)) and LF lowering back into the original position are (optionally) permitted, and the sentence will be grammatical as long as it has one grammatical derivation. So the raised verb in (101) is permitted to lower at LF; but if it does, the derivation will be filtered out by Condition A. When the embedded predicate is appropriately reflexive, as in (104), Condition A is met, in English, at S-Structure, for both the matrix and the embedded predicate, so there is no need to raise the verb at LF. (In Dutch it nevertheless raises at S-Structure, for independent reasons, but it can lower back at LF.)

- (104) Max₁ heard [himself₁ criticize himself₁].

On this view, examining the full range of anaphora options in ECM structures may shed an important light on the details of the definition of syntactic predicates, which, for reasons of space, we review here only in a footnote.⁴⁹

⁴⁹ To see what is involved, let us repeat the definition of syntactic predicates in (40a).

(40) a. The syntactic predicate formed of (a head) P is P, all its syntactic arguments, and an external argument of P (subject).

The syntactic arguments of P are the projections assigned θ-role or Case by P.

By this definition, the raised verb in, say, (101)–(103) (unlike the complex new predicate) does not form a syntactic predicate at all, since it lacks a subject. Although this has no consequences in these cases, it is relevant for ruling out (ia) and (ii).

In raising configurations such as (105a), t_i is not defined as a syntactic argument of *appear*, since *appear* does not assign Case, but the subject *herself* is a syntactic argument.

- (105) a. Lucie, believes [herself_i to appear [t_i to be smart]].
- b. Lucie, appear-believes [herself_i to t_i [t_i to be smart]]

The *appear* predicate is therefore reflexive-marked but not reflexive. For it to be allowed by Condition A, V-raising must apply, as in (105b).

Whereas Condition A, which is stated in terms of syntactic predicates, applies successfully in ECM structures, Condition B applies to semantic predicates. It therefore cannot rule out anaphora in (106). If V-raising applies in (106), the ECM subject will become a semantic argument of the matrix predicate, which will now be reflexive with no reflexive marking. Condition B therefore rules out such a derivation. But since this is only optional, a derivation still exists with the structure of (106), in which the ECM subject is not a semantic argument of the matrix verb.

- (106) a. *Lucie, considers [her, smart].
- b. *Lucie, expects [her, to leave soon].

- (i) a. *Max₁ heard [Lucie criticize himself₁].
- b. *Max₁ criticize-heard [Lucie t himself₁]
- (ii) *... dat [t_i Max₁ [t_i Lucie zichzelf, t_i] [v_i hoorde_i critiseren_i]].
that Max₁ [Lucie himself, t_i] heard criticize

If the LF representation in English remains as in (ia), or if the verb of the Dutch (ii) lowers at LF, Condition A is clearly violated, since *criticize* is reflexive-marked. The problem is what rules out the derivations in (ib) and (ii). The object anaphor in both cases is still a Case argument of the raised verb, *criticize*. (As is standard, we assume that *critiseren* in the S-Structure representation of (ii) assigns Case to its object via its trace.) Thus, the object reflexive-marks this verb. If Condition A applies here, it rules out anaphora successfully, since there is no coargument of the verb coindexed with the anaphor. However, this verb no longer forms a syntactic predicate, by (40a), so it turns out to be exempt from Condition A, incorrectly. What is at stake here is what counts as the property necessary to enable a head P to form a syntactic predicate. We took the subject as this property, primarily in order to accommodate the traditional judgments of NP anaphora. However, in view of the unclarity of these judgments, which we mentioned in section 5.1, both Voskuil (1991) and Ben-Shalom and Weijler (1990) propose to take eventhood as the defining property: only Ps that denote an event or contain an e-role form syntactic predicates. If this is so, then the raised verbs in all these examples still form a predicate, though they do not have a subject, but NPs never do. Though in the long run this may be precisely the correct move, we propose here a compromise modification of the definitions of syntactic predicates and arguments that will account for all the facts of this article:

- (iii) t is the syntactic predicate formed of P iff
 - a. t consists of P and all its syntactic arguments, and
 - b. either P has an e-role or P has a subject.
- The syntactic arguments of P are the projections assigned θ or Case by P and its external argument (subject).

Given (iii), the subject, if present, is always a syntactic argument by definition. But in its absence, a verb, unlike a noun, still may form a syntactic predicate. In (ib) and (ii) the raised verbs form the syntactic predicate *criticize himself*, which is reflexive-marked. However, no coargument exists; hence, Condition A cannot be met. (This also entails that in (104) the only grammatical derivation is the one where the verb does not raise at LF; accordingly, in its Dutch translation, the verb must lower at LF.)

As noted earlier, we believe that this is a correct result, and that anaphora here is blocked only by the Chain Condition (80), rather than by Condition B. (The pronoun forms a chain via the matrix verb, as in the cases discussed in the previous section.) Let us repeat in more detail the major argument for this, which we discussed briefly in connection with (75) and (91) and which was based on the following paradigm:

- (107) a. *Henk₁ hoorde hem₁.
Henk heard him
 - b. *Henk₁ hoorde zich₁.
Henk heard SE
 - c. Henk₁ hoorde zichzelf₁.
Henk heard himself
- (108) a. *Henk₁ hoorde [hem₁ zingen].
Henk heard [him sing]
 - b. Henk₁ hoorde [zich₁ zingen].
Henk heard [SE sing]
 - c. Henk₁ hoorde [zichzelf₁, zingen].
Henk heard [himself sing]

(The same pattern is found in Norwegian.⁵⁰ Condition B rules out both the pronoun and the SE anaphor in (107). (The pronoun is also ruled out here by the Chain Condition.) But in the ECM subject position of (108) these two split up, and only the pronoun is ruled out. This is precisely what we expect, if Condition B does not apply to this position. The pronoun is ruled out as being a +R expression, violating (80), whereas the SE anaphor does not form an illicit chain. Since a SELF anaphor is independently allowed in this position by Condition A, we derive the fact that SE and SELF anaphors are in complementary distribution in the V-complement position, but not in ECM subject position.⁵¹

⁵⁰ Parallel data from Norwegian are as follows (see Hellan 1988 for discussion):

- (i) a. *Jon₁ hørte ham₁.
Jon heard him
 - b. *Jon₁ hørte seg₁.
Jon heard SE
 - c. Jon₁ hørte seg selv₁.
Jon heard himself
- (ii) a. *Jon₁ hørte [ham₁, bli omtalt].
Jon heard [him be mentioned]
 - b. Jon₁ hørte [seg₁, bli omtalt].
Jon heard [SE be mentioned]
 - c. Jon₁ hørte [seg selv₁, bli omtalt].
Jon heard [himself be mentioned]

⁵¹ ECM constructions with *zich* and *zichzelf* as subject may yield distinct interpretations. Contrasts of this kind are discussed by Voskuil and Wehrmann (1990) and Voskuil (1990). The difference is clearest in the interpretation of resultative small clauses, as illustrated by the contrast in (i).

- (i) a. Münchhausen trok [zichzelf uit het moeras].
Münchhausen trok [zich uit het moeras].
- b. Münchhausen pulled [himself/SE out of the swamp]

7.2 A Contrast between ECM and Object Control Clauses

As mentioned in section 2.3, under the view of binding proposed here, binding facts may shed some light on an ongoing controversy between different schools in linguistic theory regarding the status of ECM and small clause structures. The alternative view is that they do not exist, and ECM subjects are objects of the matrix verb, just like objects of control verbs. (A most sophisticated and comprehensive development of this view is provided in Chierchia 1984.) Under the standard formulation of the binding theory, the two structures are indeed indistinguishable with respect to binding, but, given our analysis, there are contexts where objects of control verbs and ECM subjects are predicted to display different anaphora properties. One such contrast arises in the case of SE anaphors. As noted in connection with (108b), repeated in (109a), they are allowed as ECM subjects; but in complement position, as in (109b), our version of Condition B rules them out correctly. (Dutch does not have *to-infinitival* ECM structures.)

- (109) a. Henk₁ hoorde [zich₁ zingen].
Henk heard [SE sing]
- b. *Henk₁ overreedde zich₁ [PRO₁ te zingen].
Henk persuaded SE [PRO to sing]
- c. Henk₁ overreedde zichzelf₁ [PRO₁ te zingen].
Henk persuaded himself [PRO to sing]

Another context is conjunction anaphora. As noted earlier, conjunction anaphora (which was discussed in detail in section 4) is ruled out only by Condition B, since the conjoined pronoun does not form a chain with the V. If Condition B does not apply, we would expect such anaphora to be acceptable with ECM subjects, regardless of the collective-distributive distinction. The contrast in (110) suggests that this is indeed so.

- (110) a. *Max₁ convinced both Lucie and him₁, [PRO to leave early].
 - b. Max₁ expects [both Lucie and him₁ to leave early].
- (111) a. */?We allow me [PRO to run for this job].
 - b. We expect [me to run for this job].

Similarly, no chain is involved in either case of (111) (since *we* and *me* are not coindexed). If *we* is interpreted distributively, then in (111a) a reflexive predicate is entailed ($\lambda x (x \text{ allows } x (x \text{ runs for the job}))$ applying to *me*), which is ruled out, as unlicensed, by Condition B. But in (111b) the entailed predicate is not reflexive ($\lambda x (x \text{ expects } (x \text{ run for the job}))$ applying to *me*), so Condition B allows it.

Only (ia) can carry the reading intended in the original story whereby Münchhausen got out of the swamp by pulling his own hair (i.e., literally pulling himself out). (ib) has the more standard resultative reading, whereby Münchhausen's pulling something led to the situation of his being out of the swamp. Under our analysis, this follows from the fact that to allow for the SELF anaphor in (ia), *uit* must raise to the matrix verb; hence, in this case the anaphor is an argument of the matrix complex predicate. But in (ib) Condition B allows only the derivation in which the anaphor is just the subject of the result clause.

It is far from obvious how such contrasts can be captured in a theory assuming that the pairs in (109)–(111) have identical syntactic and argument structure.

7.3 For-To Infinitives

While on the topic of nonnominate subjects, let us look at another case, which has attracted much attention in the standard binding theory.

- (112) a. Max would like very much [_{CP} for [himself to win]].
- b. *John; would like very much [_{CP} for [him; to leave]].
- c. ?She; has recently requested for her; to be allowed to attend the meeting. (Kayne 1984:43)

In the standard binding theory (112a–b) are believed to fall under Conditions A and B (since the governing category of the embedded subject is the matrix CP). In our framework neither condition can relate the matrix subject to the anaphor or the pronoun in the embedded subject, since these are neither syntactic nor semantic coarguments at any level, nor can they form a chain via the matrix V. It may appear, furthermore, that the embedded anaphor in (112a) should be ruled out by Condition A, since it reflexively marks the nonreflexive predicate (as its subject). We doubt, however, that any theory should be modified just to accommodate this type of case. The use of an explicit anaphoric subject here is very marginal, anyway, because of the availability of a structure with PRO. We assume that *himself* in (112a) is used as a focus logophor, designed to distinguish the reading from the standard anaphoric reading obtained with a PRO. As focus it is not in an argument position, hence exempt from our Condition A. The facts regarding Condition B effects here are known to be unclear. For example, Kayne (1984) compares (112b) to the minimally different (112c), which he considers acceptable. We believe that, if such effects exist here, they should be attributed to principles like "Avoid pronoun" rather than to the binding theory.

8 Hierarchical Effects

As we have stated the binding conditions and reflexive marking, no hierarchical relations are built into them; a predicate is equally reflexive-marked if its subject or its object is a SELF anaphor. The binding conditions therefore cannot distinguish (113a) and (113b). In both cases the *criticize* predicate is defined as reflexive-marked and as reflexive, so Conditions A and B are met in both.

- (113) a. Max said that [he, criticized himself].
- b. *Max said that [himself, criticized him].

Though it is conceivably possible to build either c-command or argument hierarchy relations into the definition of reflexive marking, we believe that the binding conditions should not, in fact, distinguish these cases, and that all hierarchical effects follow independently from the Chain Condition.

As shown in section 6.2, the A-chain domain of a given NP is a subdomain of its c-command domain. It follows, therefore, that the Chain Condition (80) imposes hierarchical requirements on the relations of referential dependency within an A-chain. Given (80), the referentially independent (+R) element of the chain must be its head; that is, it must c-command the referentially dependent (–R) element. In (113) a chain is formed in the embedded IP. Although this chain is well formed in (113a), in (113b) the chain formed between *himself* and *him* is tailed by a +R element and headed by a deficient –R element. Thus, it violates the Chain Condition on both ends. The way the Chain Condition yields the hierarchical effects is further illustrated in (114) and (115).

- (114) a. Max heard [himself criticize himself].
- b. *Max heard [himself criticize him].
- (115) a. *Himself criticized Max/him.
- b. *Himself criticized himself.
- c. *Zichzelf/Hemzelf critiseerde zich.
 himself criticized SE

In (114a) the chain, headed by *Max*, appropriately contains only one +R element in its head position. But in (114b) the tail too contains a +R NP, violating the Chain Condition. (115a) is ruled out on both ends, like (114b). In (115b–c) the tail is appropriately a deficient –R element, but the chain is not headed by any +R expression, so it is ruled out.⁵²

But our claim is, in fact, stronger: it is not only unnecessary to incorporate hierarchy into the binding conditions, it is also wrong. In other words, it can be shown that the binding conditions are insensitive to any such hierarchy. This claim is based, first, on an examination of SE anaphors in Dutch. Although we have observed several times that *zich* is prevented by Condition B from being bound within its predicate, as in (116), Everaert (1991) notes that it can be bound within its predicate in (117).

- (116) a. *Jan critiseerde zich.
 Jan criticized SE
- b. *Jij hoorde [Jan zich critiseren].
 you heard [Jan SE criticize]
- (117) Jan hoorde [zichzelf zich critiseren].
 Jan heard [himself SE criticize]

⁵² For the standard cases, there is also no need to assume the nominative constraint on anaphors, since, for example, (115b) is ruled out independently by the Chain Condition. However, this constraint may still be needed in the case of focus logophors, which, as we argued in section 3.2, can occur in argument position. (See also the discussion of (112a).)

- (i) a. *Max, only said that *himself*; criticized Bill.
- b. *Max, only said that [himself, [t; criticized Bill]].

As focus, *himself* of (ib) is no longer a syntactic argument of *criticize*. Hence, as in (112a), it is exempt from Condition A. However, (ia–b) are still ruled out, since *himself* is not nominative, contrary to what its position requires, and it lacks a nominative form in its paradigm. (See Everaert 1990 for discussion.)

This is precisely what the binding conditions predict. In (116) the *criticize* predicate is not reflexive-marked; hence, reflexivity is ruled out by Condition B. But in (117) the SELF anaphor reflexive-marks both the matrix predicate and the embedded predicate (which both end up reflexive as well, satisfying Condition A). Since the *criticize* predicate is reflexive-marked here, Condition B is satisfied. Since *zichzelf* does not head a chain, but is only a link in a chain, the Chain Condition is observed as well. For clarity, let us look at the full paradigm of this structure in Dutch:

- (118) Jan hoorde
 - a. *[*zich* *zich* *critiseren*].
 - b. [*zich* *zichzelf* *critiseren*].
 - c. [*zichzelf* *zich* *critiseren*].
 - d. ??[*zichzelf* *zichzelf* *critiseren*].
 - e. *[*zichzelf* *hem* *critiseren*].

(118a) is ruled out by Condition B, since the embedded predicate is reflexive, but there is no reflexive-marking SELF anaphor. (118c) (= (117)) and (118b) are indistinguishable, and they are both allowed. (118d) is allowed by the binding conditions, but is highly marked because of the redundant use of SELF marking, in the same way that ??*Hij schaamt zichzelf* 'He shames himself' is disfavored (see footnote 15). Just like its English counterpart in (114b), (118e) is ungrammatical. However, with respect to the binding theory it is indistinguishable from (118c), so we conclude that it is not Condition B that rules out this sentence, but the Chain Condition alone. If we were to build hierarchy requirements into the binding conditions themselves, these would equally rule out both the bad (118e) and the good (118c).

As noted in section 6.3, another way to test the different scopes of the Chain Condition and the binding conditions is with conjoined or plural NP anaphora. In such cases the pronoun does not form a chain with its antecedent; hence, it can only be blocked by Condition B. Relevant cases are the following, where (119) repeats (95):

- (119) a. *I can't imagine you denouncing you or me.
- b. I can't imagine myself denouncing you or me.
- c. *I can't imagine myself denouncing me.
- (120) a. *?Did you ever hear [us praise me] in the past?
- b. Did we ever hear [ourselves praise me] in the past?

As in the Dutch example in (117), here we are examining anaphora in the embedded IP. In neither of these cases is a chain formed (since the pronoun is in an embedded NP, in (119), or not even coindexed with its antecedent, in (120)). However, unlike the (a) cases, in the (b) cases our nonhierarchical Condition B is satisfied, since the SELF reflexive-marks the embedded predicate. Though the judgments may be as subtle as always with this type of anaphora, they clearly favor the (b) cases over the (a) cases.

If Condition B were formulated to require the reflexive marker (the anaphor) to be the internal argument, the predicate in the (b) cases would end up non-reflexive-marked, and the sentences would be ruled out.⁵³

Finally, let us look at the famous problem in (121), which is often cited as indicating that the binding theory must incorporate a thematic hierarchy (e.g., Kiss 1991) or a functional hierarchy (Pollard and Sag 1992).

- (121) a. We talked with Lucie₁ about herself₁.
- b. *We talked about Lucie₁ with herself₁.

As pointed out to us by Barbara Partee, the contrast in (121) follows, in our system, if we assume that the *with* PP is a θ-argument of the verb, but the *about* PP is not (thus functioning as an adjunct). In this case, in (121a) the anaphor is logophoric and does not reflexive-mark the verb, but in (121b) it does. Hence, Condition A requires that the predicate in (121b) be reflexive, which is not the case, since the coindexed *Lucie* is not a coargument. Indeed, the *about* PP shows all other adjunct properties relevant to anaphora: a pronoun is not excluded, as shown in (122), and a first person logophor is much easier in (123b) than in the argument position in (123a).

- (122) We talked with Lucie₁ about her₁.
- (123) a. *Can you talk with myself about Lucie?
- b. Can you talk with Lucie about myself?

We conclude that the binding conditions themselves contain no reference to either configurational or thematic hierarchy. What we have tried to show here is that the work of capturing anaphora is divided between two modules. The binding theory is sensitive only to the reflexivizing function, taking care of matching it with predicate reflexivity. All other aspects of local anaphora, which have to do with the R property, fall under chain theory. Traditionally, what was always believed to be sensitive to c-command, or other hierarchical restrictions, is precisely the issue of referential dependency, which we reduced here to R-relations. It is not surprising, therefore, that this issue is the territory of chain theory.

⁵³ Fox (1993) suggests that the Chain Condition must be allowed to apply to singleton chains, since sentences such as (i) must be ruled out and Condition B cannot do this. (Because the verb *wash* is inherently reflexive, Condition B is not violated.)

(i) *Himself washed.

Although it might appear that *himself* heads only a singleton chain, it is not obvious that this is in fact so. If the verb is reflexive, it has, lexically, two positions on its grid. Therefore, the null hypothesis is that in *John washed*, just like in *John washed himself*, an object argument position is projected, which is then realized as an empty category (pro). Consequently, (i) does in fact contain a two-member chain, as represented in (ii); thus, the sentence is ruled out, without modifying the domain of the Chain Condition.

(ii) *Himself₁ washed e₁.

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Remarks and Replies

Grammatical Continuity in Language Development: The Case of Subjectless Sentences

Paul Bloom

1 Introduction

It has long been known that children acquiring English sometimes produce utterances such as *Want water*. These are unacceptable for adult speakers and must be explained by any descriptively adequate theory of language development.

Explanations fall into two classes. Discontinuous theories posit that children lack the appropriate adult competence; they do not yet understand that sentences require overt subjects. Some such theories posit an initial nonsyntactic understanding of language (e.g., Greenfield and Smith 1976), others involve principles that are not present in adult grammars (e.g., Borer and Wexler 1988), and still others suggest that children lack certain aspects of Universal Grammar, such as functional categories (e.g., Guilfoyle 1987). One particularly interesting proposal is that children acquiring English initially possess grammars where null subjects are acceptable (as in Italian or Chinese), and for some reason go through a long period before determining that the target grammar requires overt subjects (e.g., Hyams and Wexler 1993).

In contrast, continuous theories of language development adopt the strong position that young children have the same cognitive and grammatical capacities as adults. Given that 2-year-olds acquiring English are exposed to a non-null subject language, this implies that they should know that subjects are obligatory. Consequently, utterances such as *Want water* must be the result of performance factors, not deficient linguistic knowledge. There is considerable theoretical and empirical motivation for the view that young children suffer from severe production limitations, and that these sometimes lead to the

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Anaphora

The term *anaphora* is used most commonly in theoretical linguistics to denote any case where two nominal expressions are assigned the same referential value or range. Discussion here focuses on noun phrase (NP) anaphora with pronouns (see BINDING THEORY for an explanation of the types of expressions commonly designated “anaphors,” e.g., reflexive pronouns).

Pronouns are commonly viewed as variables. Thus, (1b) corresponds to (2), where the predicate contains a free variable. This means that until the pronoun is assigned a value, the predicate is an open property (does not form a set). There are two distinct procedures for pronoun resolution: *binding* and *covalueation*. In binding, the variable gets bound by the λ -operator, as in (3a), where the predicate is closed, denoting the set of individuals who think they have the flu, and where the sentence asserts that Lili is in this set.

- (1) a. Lucie didn't show up today.
- b. Lili thinks she's got the flu.
- c. Lili ($\lambda x (x \text{ thinks } z \text{ has got the flu})$)
- d. Binding: Lili ($\lambda x (x \text{ thinks } x \text{ has got the flu})$)
- e. Covalueation: Lili ($\lambda x (x \text{ thinks } z \text{ has got the flu}) \& z = \text{Lucie}$)

In covalueation, the free variable is assigned a value from the DISCOURSE storage, as in (3b). An assumption standard since the 1980s is that, while processing sentences in context, we build an inventory of discourse entities, which can

further serve as antecedents of anaphoric expressions (Heim 1982; McCawley 1979; Prince 1981). Suppose (1b) is uttered in the context of (1a). We have stored an entry for the pronoun is covalueated with this entry.

The actual resolution of anaphora is governed by discourse strategies. Ariel (1990) argues that pronouns look for the most accessible antecedent, and discourse topics are always the most accessible. For example, (3b) is the most likely anaphora resolution for (1b) in the context of (1a), since *Lucie* is the discourse topic that will make this minimal context coherent.

Given the two procedures, it turns out that if *Lili* is identified as the antecedent of the pronoun in (1b), the sentence has, in fact, two anaphora construals. Since *Lili* is also in the discourse storage, (1b) can have, along with (3a), the covalueation construal (4).

- (4) Lili ($\lambda x (x \text{ thinks } z \text{ has got the flu}) \& z = \text{Lili}$)
 (5) Lili thinks she has got the flu, and Max does too.

Though (3a) and (4) are equivalent, it was discovered in the 1970s that there are contexts in which these sentences display a real representational ambiguity (Keenan 1971). For example, assuming that *she* is *Lili*, the elliptic second conjunct of (5) can mean either that Max thinks that Lili has the flu, or that Max himself has it. The first is obtained if the elided predicate is construed as in (4), and the second if it is the predicate of (3a).

Let us adopt here the technical definitions in (6). ((6a) differs from the definition used in the syntactic binding theory). In (3a), then, *Lucie* binds the pronoun; in (4), they are covalueated.

- (6) a. Binding: α binds β iff α is an argument of a λ -predicate whose operator binds β .
- b. Covalueation: α and β are covalueated iff neither binds the other and they are assigned the same value.

Covalueation is not restricted to referential discourse-entities—a pronoun can be covalueated also with a bound variable. Indeed, Heim (1998) showed that covalueation-binding ambiguity can show up also in quantified contexts. In (7a), the variable *x* (*she*) binds the pronoun *her*. But in (7b) *her* is covalueated with *x*.

- (7) Every wife thinks that only she respects her husband.
- a. Binding: Every wife ($\lambda x (x \text{ thinks that } [\text{only } x (\lambda y (y \text{ respects } y \text{'s husband}))])$)
 - b. Covalueation: Every wife ($\lambda x (x \text{ thinks that } [\text{only } x (\lambda y (y \text{ respects } x \text{'s husband}))])$)

In many contexts the two construals will be equivalent, but the presence of *only* enables their disambiguation here: (7a) entails that every wife thinks that other wives do not respect their husbands, while (7b) entails that every wife thinks other wives do not respect her husband. This is so, because the property attributed only to *x* in (7a) is respecting one's own husband, while in (7b) it is respecting *x*'s husband.

The binding interpretation of pronouns is restricted by syntactic properties of the derivation (see BINDING THEORY).

A question that has been debated is whether there are also syntactic restrictions on their covaluation interpretation. On the factual side, under certain syntactic configurations, covaluation is not allowed. For example, in (9), binding is independently excluded. The NP *Lucie* is not in a configuration to bind the pronoun (since it is not the argument of a λ-predicate containing the pronoun). Suppose, however, that (9) is uttered in the context of (8), so that *Lucie* is in the discourse storage. The question is what prevents the covaluation construal in (10) for (9) (# marks an excluded interpretation). It cannot be just the fact that the pronoun precedes the antecedent. For example, in (11), the preceding pronoun can be covalued with *Max*.

(8) Can we go to the bar without *Lucie*?

(9) She said we should invite *Lucie*.

(10) #She ($\lambda x x$ said we should invite *Lucie*) & she = Lucie

(11) a. The woman next to him kissed *Max*.
 b. The woman next to him ($\lambda x (x$ kissed *Max*) & him = Max)

In the 1970s, it was assumed that there is a syntactic restriction blocking such an interpretation (Langacker 1966; Lasnik 1976). Reinhart (1976) formulated it as the requirement that a pronoun cannot be covalued with a full NP if c-commands, which became known as Chomsky's "condition C" (1981). (In (11), the pronoun does not c-command *Max*.) Another formulation in logical syntax terms was proposed by Keenan (1974): The reference of an argument must be determinable independently of its predicate.

The empirical problem with these restrictions is that, as shown in Evans (1980), there are systematic contexts in which they can be violated. Reinhart (1983) argued that this is possible whenever covaluation is not equivalent to binding.

(12) [Who is the man with the gray hair?] He is *Ralph Smith*.
 a. He ($\lambda x (x$ is *Ralph Smith*) & he = Ralph Smith)
 b. He ($\lambda x (x$ is *x*) & he = Ralph Smith)

- (13) Only he (himself) still thinks that *Max* is a genius.
 a. Only he ($\lambda x (x$ thinks *x* is a genius) & he = Max)
 b. Only *Max* ($\lambda x (x$ is a genius) & he = Max)
- In (12), it is not easy to imagine a construal of the truth conditions that would not include covaluation of the pronoun with *Ralph Smith*. But this covaluation violates condition C, as does (13). In both cases, however, the covaluation reading (a) is clearly distinct from the bound reading (b). (12b) is a tautology, whereas (12a) is not. (13a) attributes a different property only to *Max* from what (13b) does. Believing oneself to be a genius may be true of many people, but what (13) attributes only to *Max* is believing *Max* to be a genius (13a).
- The alternative (proposed by Reinhart 1983) is that covaluation is not governed by syntax, but by a discourse strategy that takes into account the options open for the syntax in generating the given derivation. The underlying assumption is that variable binding is a more efficient way to obtain anaphora than covaluation. So whenever the syn-

tactic configuration allows, in principle, variable binding, obtaining an equivalent anaphora-interpretation through covaluation is excluded. Given a structure like (9), variable binding could be derived, with a different placement of *Lucie* and *her*, as in *Lucie said we should invite her*. The result would be equivalent to the covaluation construal (10) (for (9)). Hence, (10) is excluded. In (11a), no placement of *he* and *Max* could enable variable binding, so the covaluation in (11b) is the only option for anaphora. When a variable binding alternative exists, but it is not equivalent to covaluation, covaluation is permitted, as in (12)-(13).

A relevant question is why variable binding is more efficient than covaluation. One answer, developed in Levinson (1987), is purely pragmatic and derives this from the Gricean maxims of quantity and manner. The other, developed in Fox (1998), is based on the notion of semantic processing: variable binding is less costly since it enables immediate closure of open properties, while covaluation requires that the property is stored open until we find an antecedent for the variable.

The optimality account for the covaluation restriction entails a much greater computational complexity than the syntactic approach (condition C), since it requires constructing and comparing two interpretations for one derivation. This is among the reasons why covaluation is still a matter of theoretical debate. Nevertheless, evidence that such complexity is indeed involved in computing sentences like (10) comes from the acquisition of anaphora. Many studies (e.g., Wexler and Chien 1991) report that children have much greater difficulties in ruling out illicit covaluation than in violations of the syntactic restrictions on variable binding. Grodzinsky and Reinhart (1993) argue that this is because their working memory is not yet sufficiently developed to carry such complex computation.

See also PRAGMATICS; SEMANTICS; SENTENCE PROCESSING; SYNTAX-SEMANTICS INTERFACE

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