

Primitives of Binding

Eric Reuland

This article explains the conditions on the binding of pronouns, simplex anaphors, and complex anaphors, distinguishing the roles of the computational system, interpretive procedures, and discourse storage. It argues for a general principle of economy counting interpretive steps. Locality conditions on binding are shown to follow from this economy principle and independent principles of (minimalist) syntax, providing the means to encode certain dependencies, most economically, within the computational system. It shows that the role of complex anaphors in licensing reflexivization follows from an interpretive condition holding at the conceptual-intentional (C-I) interface.

Keywords: binding theory, minimalism, reflexivity, feature checking, division of labor, economy

1 Introduction

It is an intriguing question why natural languages generally have a contrast between pronominals and anaphors, and, within the latter category, a further contrast between simplex and complex anaphors. Ideally, we should be able to relate this fact to more general design properties of the human language capacity. In this article I will focus on two specific questions that emerge from this larger issue and that will be shown to be closely related: (a) How are binding relations encoded in the grammatical system? and (b) Why do reflexive predicates require special licensing in natural language? These questions are further elucidated in the next two sections.

1.1 The Grammatical Encoding of Binding Relations

The canonical binding conditions show a mix of syntactic and semantic factors. Consider the formulation given in Chomsky 1981:188, 211.

- (1) A. An anaphor is bound in its governing category.
- B. A pronominal is free in its governing category.

This article builds on and extends the reflexivity framework developed in Reinhart and Reuland 1993. It contains material presented at the 18th GLOW Colloquium (Tromsø), NELS 26 (Harvard/MIT), the Atomism of Binding Workshop (Leiden), the Syncom Project (NIAS-Wassenaar), the 1997 Workshop on Reflexives and Reciprocals (Boulder, Colorado); in courses taught at Eötvös Loránd University (Budapest), Innovationskolleg (University of Potsdam), and the 1996 LOT Summer School (Amsterdam); and in a minicourse taught in May 2000 at UCLA. I wish to thank members of the various audiences for their encouraging comments, and in particular Norbert Hornstein for his comments during NELS. For important comments on various written versions I would like to thank Denis Delfitto, Martin Everaert, Iris Mulders, Tanya Reinhart, Tigran Spaan, and *LI*'s anonymous reviewers. All errors are mine.

where β is a *governing category* for α if and only if β is the minimal category containing α , a governor of α , and a SUBJECT (accessible to α); and α *binds* β iff α and β are coindexed and α c-commands β .

Notions such as ‘‘contain,’’ ‘‘governor,’’ ‘‘subject’’ are clearly syntactic. The notion of an index is in principle semantic, as is the notion of binding itself. One of the prerequisites for attaining the goals of the Minimalist Program (MP) developed in Chomsky 1995, 2000, to appear, is to draw the boundaries of syntax in a principled way. The MP proposes that the computational system of human language (C_{HL}) reflects the combinatorial properties of a purely morphosyntactic vocabulary. Furthermore, its guiding hypothesis is that C_{HL} is an optimal solution for a system pairing form and interpretation that is to meet the specific conditions imposed by the human systems of thought and perception/articulation. A ‘‘perfect language’’ should meet the Inclusiveness Condition: any structure formed by the computation is constituted of elements already present in the lexical items selected. No new objects such as indices are added in the course of the derivation. Hence, indices, the core ingredient of the canonical binding theory, are not available within C_{HL} . Chomsky therefore proposes that binding conditions can apply only at the conceptual-intentional (C-I) interface.

Let us consider first how far minimal assumptions could get us. A minimal assumption about the interpretive system is that the interpretation of the syntactic (LF) structures proceeds compositionally: for any constituent $K = [_L \alpha \beta]$, where L is K ’s label reflecting the way in which α and β have been merged, $\|K\|$ is determined by $\|\alpha\|$, $\|\beta\|$, and $\|L\|$. The issue, then, is what aspects of the binding theory can be accommodated in a compositional interpretation procedure. On a conceptual level it is easily seen that referential dependence finds a natural expression, and so do semantic differences between anaphoric expressions. At this level binding can be straightforwardly understood as ‘‘logical syntax binding.’’ Following Reinhart (2000), one may say that binding is just the procedure of closing a property, which can be implemented as binding a free variable to a λ -operator, as in (2).

(2) *A-binding* (logical-syntax-based definition, Reinhart 2000)

α A-binds β iff α is the sister of a λ -predicate whose operator binds β .

This is illustrated in (3), where (3a) can be interpreted either as (3b), with a variable left free, or as (3c), with binding.

- (3) a. Only Lucie respects her husband.
 b. only Lucie (λx (x respects y ’s husband)) (y could be valued as any female individual)
 c. only Lucie (λx (x respects x ’s husband))

Like other approaches, this conception of binding expresses that variable binding is intrinsically unbounded and not sensitive to syntactic islands, as shown by sentences like (4).

- (4) a. *Every* boy was afraid that Mary would inform Zelda as to why the attic in *his* house was such a mess.

- b. every boy (λx (x was afraid that Mary would inform Zelda as to why the attic in x 's house was such a mess))

Yet, as indicated by the binding conditions in (1), the well-formedness of binding anaphors or pronominals is subject to locality conditions referring to syntactic properties of the structures containing them.

Such locality requirements find no natural expression in a logical syntax conception of binding. Of course, the option exists of building locality requirements into the interpretive procedure. However, since locality cannot be a characteristic of interpretive dependencies per se, such a step would only state the problem, rather than solve it. Also, from the perspective of the overall structure of C_{HL} the binding conditions in (1) are arbitrary as stated. They reflect no conceptual necessity, nor do they obviously follow from any of the basic properties of the grammatical system. For instance, no other property of Universal Grammar (UG) is affected if the notion “governing category” is replaced by “complete functional complex” (Chomsky 1986) or by another domain definition introducing further syntactic factors.¹

The question is, then, why binding of anaphors and pronominals is sensitive to locality. The central status within C_{HL} of the locality conditions on Move indicates that the locality conditions on binding should ideally be derived from those on Move (or any of its components). If correct, this challenges the hypothesis that all binding pertains to the C-I interface. In this article I will show that there is indeed an irreducible syntactic residue in binding.²

Prima facie support for this position (and a challenge to any different view) is the considerable microvariation in binding. For instance, within Germanic there are differences in the binding possibilities of pronominals among Dutch, German dialects, and Frisian (see Reuland and Reinhart 1995). Reuland and Reinhart show that these differences follow from (sometimes subtle) differences in Case systems. As is well known from work such as Zribi-Hertz 1989, French and the Germanic languages differ considerably with respect to binding into PPs. There is further variation within the Romance languages—for instance, between Italian on the one hand and French, Spanish, and Portuguese on the other (see, e.g., De Jong 1996 and Menuzzi 1999 for relevant facts and discussion). Even apart from particular explanations, the mere existence of such microvariation indicates that binding is sensitive to properties of the language system that are syntactic. The

¹ At least, this is so in current conceptions of grammar in which the interpretation of traces has been dissociated from the binding theory (cf. Chomsky 1995).

² As we saw, if the binding theory applies at the C-I interface, this raises questions about locality. It also raises questions about c-command. Chomsky (1995) and others (basing their work on Epstein 1994), propose that the c-command requirement on movement be derived from mechanisms intrinsic to C_{HL} . To the extent to which A-binding has a syntactic residue, the c-command requirement on movement could easily generalize to the c-command requirement on A-binding. It is difficult to see, however, how the general c-command requirement on variable binding, including its well-known exceptions, could be derived in this manner. Note, however, that Reinhart (1983) already suggested that the c-command requirement on variable binding follows from trivial principles of compositionality and a processing condition requiring early closure of open expressions, which goes back to Kimball 1973 (see Reinhart 2000 for further discussion). Ideas along these lines are elaborated in Reuland 1998 and generalized to c-command within C_{HL} . However, since this issue is orthogonal to present concerns, let it suffice to note that it can in principle be solved.

question is, then, whether it is possible in principle to develop an approach to binding that is compatible with the Inclusiveness Condition and yet sensitive to syntactic factors.

1.2 Licensing Reflexivity

Crosslinguistically, reflexive constructions have a special status. Let us take a simple transitive construction as a core case. From the perspective of a logical syntax it is impossible to see why the reflexive counterpart of a structure we may represent as $DP_1 V DP_2$ or $DP_1 (\lambda x (x V DP_2))$ could not be obtained by simply replacing DP_2 by an element that can be interpreted as a variable bound by the λ -operator and valued by DP_1 . For instance, since we know that pronominals can be rendered as variables (as in *Everyone expected Bill to hate him*), it is a real question why *Everyone hated him* cannot mean that everyone hated himself. Of course, that this interpretation is impossible is stated in the canonical Condition B of the binding theory. However, Condition B is a descriptive generalization, not a principle for which either Government-Binding Theory or minimalist approaches provide intrinsic reasons. Furthermore, many languages distinguish between pronominals and simplex anaphors, SE anaphors in the terms of Reinhart and Reuland (1993). In Dutch the SE anaphor *zich* differs from the pronominal *hem* in that it must be bound. That is, it appears to be a true anaphor. Yet the Dutch counterpart of *Everyone hated him* with the pronominal replaced by a SE anaphor (*Iedereen haatte zich*) is still ill formed. In such cases the complex anaphor (SELF anaphor) *zichzelf* instead of *zich* is required. This fact follows neither from the canonical Condition B, nor from the canonical Condition A. This is not an idiosyncrasy of Dutch and a few languages in the same area. As observed by, for instance, Schladt (2000), languages go to great lengths to avoid simple reflexive instantiations of transitive predicates. Schladt (2000) surveys over 140 languages from many different language families, all of which require special marking for reflexive predicates instead of simply having a locally bound simplex anaphor or pronominal. The means languages employ to license reflexive predicates are varied (reflexive clitics, verbal affixes, body part expressions, putting the reflexive in a PP, etc.), but the need to do so is general. This phenomenon must therefore reflect a deep property of natural language.³

The special status of reflexive predicates also shows up in a pervasive contrast between transitive and exceptional-Case-marking (ECM) constructions. Whereas the canonical binding theory treats the relations between arguments α and β in (a) $[\alpha V \beta]$ and (b) $[\alpha V [_\gamma \beta \dots]]$ as equivalent (assigning identical governing categories to β in (a) and β in (b)), in fact they are not. In Dutch and Frisian, for instance, canonical transitive predicates of the *haten* 'hate' type require a SELF anaphor in (a), but no predicate does in (b). Whereas in English a distributive reading requires a SELF anaphor in the position of β in a structure like (c) $[\alpha V [DP \text{ and } \beta]]$ with β

³ Schladt mentions four languages that he claims do not require special marking, among them Frisian. For Frisian this is mistaken (see section 6). I will assume that the others can be put aside until they have been investigated in detail. Another case that may challenge the conclusion in the text is Old English (see Keenan 2000 and Van Gelderen 2000 for contrasting views on this matter). So far, however, the patterns found in Old English do not appear to differ significantly from those found in Frisian.

bound by α , in (d) $[\alpha \text{ V } [_\gamma[\text{DP and } \beta] \dots]]$ this is not required (see Reinhart and Reuland (R&R) 1993 for discussion). Spanish shows no delayed Condition B effects in the acquisition of direct object clitics, but such an effect does show up in ECM constructions (see Baauw 2000 for extensive discussion). This contrast between these positions is unaccounted for in the canonical binding theory and its elaborations. However, it follows from the revised Condition B in R&R 1993. Yet, just like the canonical Condition B, the revised Condition B is essentially a (more accurate) descriptive generalization. Ideally, it should be derived from more basic properties of the grammatical system. The second question, then, is why reflexivity must be linguistically licensed.

1.3 Goals and Limits of the Analysis

In answering the first question, I will focus on binding of SE anaphors (Dutch *zich*, Icelandic *sig*, etc.) versus pronominals, in positions of structural, objective Case. I will show that binding of SE anaphors in these positions can be encoded within C_{HL} and that their locality properties follow from that encoding. Furthermore, I will show that binding of pronominals cannot be encoded within C_{HL} and that the requirement for pronominals to be locally free follows from this result together with a general principle governing the division of labor between C_{HL} and the interpretive components. In order to establish this, I will include a substantial discussion of the linguistic components involved in binding and coreference. This will lead to a proposal concerning the division of labor among the syntactic, semantic, and pragmatic systems underlying language.

I will refrain from providing more than a summary discussion of binding into PPs. As indicated above, it is an area with considerable microvariation. Detailed discussion of derivations would require taking into account various language-specific parameters, which, moreover, leave open many questions from the perspective of current theory—an undertaking beyond the scope of an article. For present concerns it will be important only that the approach developed here can in principle be extended to SE anaphors and pronominals in other environments, including PPs.

The limitation of this part of the discussion to SE anaphors reflects the empirical claim that the process of binding SE anaphors is different from the processes involved in binding other anaphoric elements, such as reflexive clitics in Romance or Slavic languages on the one hand, and SELF anaphors in Dutch and Icelandic, but also English, on the other. In section 6 I will briefly discuss the binding of SELF anaphors. For relevant discussion of the role of reflexive clitics, see Reinhart, to appear.

The need to license reflexive predicates will be shown to follow from the fact that binding of a simplex element (in fact, either a SE anaphor or a pronominal) by a coargument effectively eliminates one argument and hence leads to a violation of thematic requirements.

2 A Preliminary Question

Within the standard binding theory based on Chomsky 1980 and subsequent work (e.g., Chomsky 1981, 1986, Chomsky and Lasnik 1993), the notions “anaphor” and “pronominal” are used as primitives. This is independent of whether the contrast between pronominals and anaphors is

expressed in a feature system [$+/-$ anaphoric, $+/-$ pronominal]. Such features do not clarify what it means to be a pronominal or anaphor. Here, I will assume that such features have no independent existence. My working hypothesis is that the behavior of pronominals and anaphors can be fully understood on the basis of the ϕ -features they possess, and the way these interact with properties of the grammatical system.

Let us, then, take as a starting point the existence within UG of a collection of lexical and grammatical features providing the basis for possible lexical entries.

Assume that among these features are categorial features and ϕ -features (person, number, gender, and, presumably, Case (putting aside the question of whether some of these features have a finer articulation)). The null hypothesis is that any combination of values for these features will exist—in particular, the set of bundles of ϕ -features [α person, β number, γ gender] with categorial feature D (or perhaps N), which characterizes the set of pronominals, and, in the absence of motivated restrictions, also any element bearing categorial feature D and characterized by a subset of these features. SE anaphors in Dutch, Icelandic, and the like, precisely fit that bill. They are Ds that are marked neither for gender nor for number, but are marked for person.⁴ According to the null hypothesis, then, their existence comes at no cost.⁵ (I will henceforth occasionally use the term *pronoun* for both pronominals and SE anaphors.)

Consider next complex anaphors (SELF anaphors). Faltz (1977) presents an extensive overview of reflexivization types. All complex anaphors he discusses, whether they are *head reflexives* or *adjunct reflexives*, to use his terms, are made up of combinations of morphemes (pronouns, elements like *self* or their cognates, body parts, etc.) that exist independently. Again, the existence as such of these combinations cannot be prevented.⁶

We conclude that the existence of the various pronominal and anaphor forms comes for free. The core question we must answer is why they behave and contrast the way they do, on the basis of features that are independently motivated.

⁴ These properties are illustrated in the following paradigm:

- (i) a. *Gender*
 Hij_i/Zij_i voelde zich_i wegglijden.
 he/she felt SE slide away
- b. *Number*
 Hij_i/Zij_i voelde/voelden zich_i wegglijden.
 he/they felt_{sing}/felt_{pl} SE slide away
- c. *Person*
 Hij_j/*Ik_i voelde zich_i wegglijden.
 he/I felt SE slide away

⁵ There may well be principles that regulate what are admissible combinations. I simply assume that a cost is associated with ruling a particular combination out, not with ruling it in.

⁶ Head reflexives are instantiated by the body part reflexives found in many languages, such as Basque, Fula, Malagasy, and Hebrew. Under the analysis proposed by Helke (1971) and many others, including R&R (1993), SELF anaphors in English are head reflexives as well. Faltz (1977) analyzes English *himself* as an adjunct reflexive, with SELF as the adjunct. Here, I will not take a firm stand on the issue.

3 Properties of the Anaphoric System

3.1 The Binding Requirement on Anaphors

It is generally taken for granted that anaphors (both SE anaphors and SELF anaphors) have an intrinsic property that forces them to take a linguistic antecedent (the binding requirement of Condition A). That is, they are referentially defective.⁷ The question is why this is so. A common line is that (5) holds (Bouchard 1984).

- (5) In order for an argument α to be interpreted, it must have a full specification for ϕ -features.

From a theoretical perspective, however, (5) is a stipulation. (5) cannot be reduced to known properties of features, as the role lexical and formal features play is to constrain the interpretation of the elements carrying them. Thus, one should expect (6) to hold, rather than (5).

- (6) If α has fewer ϕ -features than β , there are fewer constraints on the interpretation of α than on the interpretation of β .

So, a SE anaphor such as Icelandic *sig*, which carries only the feature 3rd person, should have a broad range of application—namely, to all objects distinct from speaker and addressee. From this perspective, a general binding requirement on anaphors as commonly assumed, if true, is a mystery. The question is, then, is it true?

In fact, it has been known for some time that anaphors need not always have a syntactic binder. Under certain conditions they may be used logophorically (e.g., Hagège 1974, Clements 1975, Sells 1987, Thráinsson 1991, Zribi-Hertz 1989, Pollard and Sag 1992, R&R 1991, 1993, Reuland and Sigurjónsdóttir 1997). The following Icelandic examples should suffice for illustration. Here, the same element *sig* that requires a local binder in (7) occurs grammatically without a syntactic binder in (8) and (9). ((8) and (9) are from Thráinsson 1991.)

- (7) *Jón_i veit að María elskar sig_i.
Jon knows that Maria loves-INDIC him
- (8) Skoðun Jóns_i er [að þu hafir svikið sig_i] . . .
opinion Jon's is that you have betrayed self
- (9) María var alltaf svo andstyggileg. Þegar Ólafur_j kæmi segði hún
Maria was always so nasty when Olaf would come would tell she
sér_{i/*j} áreiðanlega að fara . . .
himself certainly to leave
'Maria was always so nasty. When Olaf would come, she would certainly tell himself
[the person whose thoughts are being presented—not Olaf] to leave.'

⁷ To my knowledge virtually all of the current linguistic literature (including R&R 1991, 1993) takes this position.

In (8) *Jón* fails to c-command *sig*, hence cannot be a syntactic binder (*sig* is not interpreted as a bound variable in such cases (Thráinsson 1991)); in (9) a linguistic antecedent is lacking altogether.

Within the standard binding theory, this logophoric use of unbound anaphors is an exception that must be explained. Two factors have been claimed to play a role: the presence of subjunctive mood, and discourse factors such as the availability of a discourse entity holding the perspective of the sentence (e.g., Thráinsson 1991, Hellan 1988, 1991). Subjunctive mood, however, is not a necessary condition. Crosslinguistically, only the discourse factors appear to be constant. In other languages, varying from English to Chinese, logophoric interpretation of anaphors is also possible without subjunctive mood.⁸ From the perspective of the standard binding theory this makes logophoricity a rather puzzling phenomenon: if a discourse element is prominent enough, this prominence can override a principle that otherwise should lead to ungrammaticality. Such a role for interpretability goes against all other known properties of C_{HL} . Thus, from this perspective logophoric use of anaphors is not just an exception, but a real anomaly.

We thus have two anomalies: (a) property (5), instead of the expected (6); and (b) the status of logophoricity. (7)–(9) warrant the following conclusion:

(10) There is no intrinsic property of anaphors that prohibits an unbound interpretation.

(10) is in line with (6). This does not imply that the choice of an element with low content such as a (logophoric) anaphor over an element with higher content such as a pronoun is free. Rather, we expect the selection to be governed by accessibility conditions (Ariel 1990). That is, free anaphors, having a low descriptive content, can only be used for elements that are of the highest accessibility, in terms of discourse factors such as center of consciousness and point of view. And this is what we find. Yet it is not always the case that an unbound anaphor can be interpreted. In fact, there are many languages and environments where they never can be or are at least highly marked.

We have made some progress. We started with two anomalies. These anomalies have been obviated, still leaving us with a question. But the question has shifted. The standard binding theory leads to the question why, under certain conditions, logophoric interpretation is allowed. From the present perspective the proper question to ask is instead (11).

(11) Why, under certain conditions, is logophoric interpretation of anaphors blocked?

In the next section we will see that a question with a similar format has arisen in a different area of the binding theory, and has been resolved. I will show that (11) can be answered by exploiting this parallel.

⁸ See Pollard and Sag 1992 for extensive discussion and relevant examples of discourse effects in English. The possibility of logophoric interpretation may depend on real-world knowledge, such as whether the envisaged discourse antecedent is alive or dead, as is the case in Chinese (C.-T. James Huang, personal communication).

3.2 Coreference versus Bound Variable Binding

There is an extensive literature, starting with Keenan 1971, on the issue of *bound variable binding* versus *coreference* (see in particular Evans 1980, Reinhart 1983, Wexler and Chien 1985, Grodzinsky and Reinhart 1993, Chierchia 1995, and, from a different perspective, Fiengo and May 1994). In sentences such as (12) the pronoun is either interpreted as a bound variable (the sloppy reading) or assigned a value from the discourse storage (the strict reading).

(12) Bill liked his cat and Charles did too.

This ambiguity is standardly represented as in (13) and (14).

(13) Bill λx (x liked a's cat) & Charles λx (x liked a's cat)

(14) Bill λx (x liked x's cat) & Charles λx (x liked x's cat)

In (13) the pronoun *his* is interpreted referentially. Given that (13) is insensitive to the specific value of *a*, the interpretation where *a* = Bill is covered as well. In (14) the pronoun is interpreted as a variable and must be linked to a suitable binder, *Bill* in the first conjunct, *Charles* in the second.

Since C_{HL} is restricted to computations in a strictly morphosyntactic vocabulary (see section 1), the choice between (13) and (14) as the translation of (12) cannot be syntactically encoded.⁹ Hence, up to the interface with the interpretive system (the C-I interface of Chomsky 1995 and subsequent work), pronouns are characterized only by their ϕ -features. This leads to (15).

(15) At the C-I interface pronouns can be translated either as expressions receiving a value directly from a discourse storage or as variables to be bound by an antecedent.

This choice must be intrinsically free, which has the well-known consequence illustrated on the basis of (16), with *him* identical to *Bill*.

(16) **Bill* adores *him*.

Given (15), (16) has two representations at the interface, one where *him* is a variable bound by *Bill*, the other where *him* is referential.

(17) a. Bill λx (x adores x)

b. Bill λx (x adores a)

⁹ I do not think that a strong version of the thesis that indices are morphological objects can be seriously entertained. Of course, the grammatical system may comprise more than C_{HL} and contain (subparts of) the interpretive system. Thus, indices can be grammatical objects in an extended sense. This is how I understand the approach taken in Fiengo and May's (1994) detailed discussion of the binding theory. Their insights do not depend on indices' being morphological objects as such objects are understood here. Rather, what is at stake is how the means to express relations between arguments are distributed among the components of the language system. This article constitutes an argument that the lines should be drawn differently than Fiengo and May do. Given the intended scope of the article, it is impossible to go into the wealth of facts they discuss. Later I briefly return to one of the general issues they raise.

Since the value of *a* can be freely chosen, one interpretation of (17b) is (18).

(18) Bill λx (x adores Bill)

Reading (17a) is ruled out under the standard Condition B (whatever its proper formulation), but (18) is not, even though (16) does not obviously allow this reading.

As is well known, ruling out this interpretation under all circumstances would be wrong, since this would incorrectly also rule out (19) (from Reinhart 1983) under the intended interpretation.

(19) I know what Mary and *Bill* have in common. Mary adores *him* and *Bill* adores *him* too.

Here, *him* must admit Bill as its value, yielding coreference between *Bill* and *him*. Any theory must represent the fact that coreference is allowed in (19), but impossible in (16).

Here I will pursue the line of thought set out by Reinhart (1983) and Grodzinsky and Reinhart (1993).¹⁰ Instead of formulating a rule that exceptionally allows the coreference option, Grodzinsky and Reinhart formulate an interpretive condition expressing when the coreference option is blocked.

(20) *Rule I: Intrasentential coreference*

NP A cannot corefer with NP B if replacing A with C, C a variable A-bound by B, yields an indistinguishable interpretation.

Applied to (16), (20) lets through only the bound variable structure represented in (17a). (17a) in turn is ruled out by Condition B. Hence, (16) under the intended interpretation will end up being ruled out altogether.

Although it is possible to simply stipulate the *cannot corefer* part of (20), Reinhart (1983) proposes a rationale. Coreference is not grammatically “impossible” in (16); instead, the option cannot be used given the availability of a process that is preferred for independent reasons (“early closure” of an open expression; see the discussion in Reinhart 1983). Thus, Rule I uses an economy principle, reflecting a division of labor within the linguistic system: the process of encoding a dependency in the semantic structure by variable binding is, then, more readily accessible, or “less costly,” than establishing coreference by using the discourse storage.¹¹ In section 5 I will propose a somewhat different rationale and discuss the metric involved in detail.

¹⁰ Heim (1993) and Thornton and Wexler (1999) elaborate an alternative to the bound variable/coreference contrast based on the notion of a *guise*. Strictly speaking, under this approach *Bill* and *him* in the second clause of (19) are interpreted not as the same semantic object, but as different guises (where the assignment of guises is governed by pragmatic considerations). Assuming that Condition B is sensitive to difference in guise, *Bill adores him too* does not violate Condition B. The choice between approaches based on coreference or on guises is orthogonal to present concerns. In a guise-based approach one still needs a principle to tell why different guises are required and when, precisely, this requirement obtains. Hence, all the relevant lines of the present argument are preserved. (See Baauw and Delfitto 1999 for a discussion of various implications of a guise-based approach.)

¹¹ An approach using guises either has to stipulate that (16) is ill formed if *Bill* and *him* refer to the same guise of some entity, or has to derive this from whatever difference in fate befalls the *one guise twice* option as compared to the *two guises once* option. Reinhart (2000) discusses a number of problems arising with Rule I as formulated, and shows how they can be obviated given certain modifications, including adopting the definition of binding given in (2). She

What is relevant for present purposes is that the distribution of bound versus logophoric interpretation of anaphors reflects a similar logic. Accessing the discourse storage resulting in a logophoric interpretation is only possible where the otherwise more readily accessible alternative of assigning an interpretation via computation is not available. (For detailed discussion of this procedure, see section 4.5.) As in the case of Rule I the preferred option may be blocked for independent reasons; if it is, there is no way to get around it.

This preference for the bound interpretation of anaphors is like a *residue of Condition A*. In section 5.2 we will see that it too can be made to follow from the division of labor between components of the language system.

Before addressing this broader issue, we will have to consider in detail the contrast between anaphors and pronominals. I will conclude this section by arguing that the choice of anaphors over pronominals involves the same logic, but different components—namely, narrow syntax (C_{HL}) versus semantic structure (logical syntax) at the C-I interface.¹² In section 4 I will present a detailed analysis of the nature of the syntactic computation of anaphoric dependencies.

argues that what underlies Rule I is a cooperation strategy, giving the following intuitive statement of a general principle that could be involved: ‘‘If a certain interpretation is blocked by the computational system, you would not sneak in precisely the same interpretation for the given derivation, by using machinery available for the systems of use.’’ This view is not incompatible with the view of economy adopted here. I will defer further discussion to another occasion.

¹² Fiengo and May (1994) find Reinhart’s Rule I problematic, since a token sentence *S* does not contain enough information to evaluate it anaphorically. One must have access to at least one other token sentence *S*’ to evaluate it. This introduces a transderivational aspect to the theory of anaphora, which Fiengo and May imply is undesirable. However, this argument is inconclusive. Whether or not transderivational properties are problematic depends entirely on their empirical import. As we have seen, Grodzinsky and Reinhart (1993) explain delays in the acquisition of pronominal binding precisely by hypothesizing that children compare derivations and are prevented from reaching the adult conclusion by their processing limitations.

Fiengo and May also present another argument in favor of the notion that coindexing is grammatically meaningful. Comparing the inferential patterns in (i)–(iii), they claim that all three are similar in that their triviality is a matter of language.

- (i) People respect only themselves.
John respects himself.
Therefore, John respects himself.
- (ii) People think only they themselves are crazy.
John₁ thinks he₁ is crazy.
Therefore, John thinks he, John, is crazy.
- (iii) Pictures of people’s fathers belong only to those people.
Pictures of John₁’s father belong to him₁.
Therefore, pictures of John’s father belong to John.

This similarity should be captured, they argue. In (i) and (ii) the relation between antecedent and pronoun in the second premise can be analyzed as bound variable binding; but, owing to the lack of c-command, in (iii) it cannot. This failure to generalize over (i)–(iii) they consider problematic for Reinhart’s approach. However, it could equally easily be argued that one should not even generalize over (i) and (ii), since the dependency in (i) is morphosyntactically encoded, whereas the one in (ii) is not. It is important to observe in matters of this type that language results from the interaction of different mental faculties. Some phenomenon may well be a matter of language, without being a matter of C_{HL} proper, or even a matter of grammar in a broader sense.

3.3 *Bound Variables_{pron} versus Bound Variables_{anaph}*

One of the basic binding facts is that pronominals are locally free (the canonical Condition B). The Dutch examples (21) and (22) illustrate this (avoiding interference of the predicates involved; see section 4).

(21) *Oscar* voelde [*zich* wegglijden].

Oscar felt himself slide away

(22) **Oscar* voelde [*hem* wegglijden].

him

The main predicate *voelde* ‘felt’ takes an ECM complement, and, following standard definitions, the matrix subject is in the governing category of the complement subject. Therefore, Condition B excludes the pronominal in (22) but not the anaphor in (21). However, by itself, Condition B is just a descriptive generalization. We must discover why it holds.

Both pronominals and anaphors can be translated as bound variables. Hence, both (21) and (22) can be assigned the same interface representation, (23).

(23) Oscar λx (x felt (x slide away))

We must express that (21) is preferred over (22) as a source for (23). Preferably, inherent properties of anaphors and pronominals should be determined from which their behavior follows. Pursuing the parallel with Rule I, logical binding should be compared with some other way of establishing a relation (which, in the end, should be preferred). *Hem* ‘him’ and *zich* ‘himself’ are distinct in morphosyntax but may yield identical expressions at the interface. Therefore, we will look for a syntactic process that can link *zich* to an antecedent, but cannot do so with *hem*. This process should be general, but sensitive to the difference in feature composition between *hem* and *zich*. For ease of reference, I will format this desideratum like Rule I, repeated here, but will replace *indistinguishable interpretation* by *indistinguishable interface representation*, which is precisely what is at stake here.

(24) *Rule I: Intrasentential coreference*

NP A cannot corefer with NP B if replacing A with C, C a variable A-bound by B, yields an indistinguishable interpretation.

(25) *Rule BV (to be revised)*

NP A cannot be A-bound by NP B if replacing A with C, C an NP such that B R C, yields an indistinguishable interface representation.

Given (25), we must identify a syntactic relation *R* such that *Oscar R zich* (see (21)), but not *Oscar R hem* (see (22)). Moreover, *R* must be able to ensure a corresponding interpretive dependency. In section 4 I will show that *R* derives from syntactic feature-checking relations. In section 5 I will present a simple metric indicating that this dependency can indeed be formed more readily than a variable binding dependency.

4 Encoding Dependencies within C_{HL}

In this section I discuss in detail how the relation R distinguishes between anaphors and pronominals.

4.1 Chains and Predicates

Reinhart and Reuland (R&R) (1993) show that the canonical Conditions A and B of the binding theory do not reflect unitary phenomena. Properties of reflexive predicates and properties of chains yield distinct effects. When conditions on reflexivity are satisfied, local binding of pronominals may still be excluded. R&R show that this follows from chain theory, properly revised.¹³

There are nontrivial differences between chains in R&R 1993 and chains as conceived in Chomsky 1995. Chains in R&R 1993 are representational and based on coindexing. MP-type chains are derivational and not based on coindexing. Yet the results of the Chain Condition can also be derived within the more restricted framework of Chomsky 1995 given further elaboration of its consequences. I will develop a precise reconstruction of the relation R and the distinction between pronominal binding and anaphor binding.

Before doing so, I will briefly recapitulate the differences between reflexivity effects and Chain Condition effects. Consider a language like Dutch, which has a three-way contrast in the anaphoric system (pronominals, simplex anaphors, complex anaphors). The binding theory must account not only for the contrast in (26) and (27), but also for the contrasts with (28) and (29).

(26) *Oscar haat zichzelf***zich*.

Oscar hates himself

(27) *Oscar gedraagt zich*.

Oscar behaves SE

¹³ For ease of reference, I summarize the relevant definitions and conditions.

(i) *Definitions*

- a. The *syntactic predicate* formed of (a head) P is P , all its syntactic arguments, and an external argument of P (subject).
- b. The *syntactic arguments* of P are the projections assigned θ -role or Case by P .
- c. The *semantic predicate* formed of P is P and all its arguments at the relevant semantic level.
- d. A predicate is *reflexive* iff two of its arguments are coindexed.
- e. A predicate (of P) is *reflexive marked* iff either (i) P is lexically reflexive or (ii) one of P 's arguments is a SELF anaphor.

(ii) *Binding conditions*

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

(iii) *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 , $1 < j < n$, α_j carries that index, and
 - b. for all j , $1 < j < n$, α_j governs α_{j+1} .

(iv) *Condition on A-chains* (condition on well-formedness)

- A maximal A-chain $(\alpha_1, \dots, \alpha_n)$ contains exactly one link— α_1 —that is completely specified for grammatical features.

In (26) a complex anaphor is required; in (27) it is not. Yet the syntactic environments are identical, and the distinction cannot be captured in the standard binding theory. It is captured by R&R's Condition B, which expresses that a reflexive predicate must be reflexive marked. It is reflexive marked if one of its syntactic arguments is a SELF anaphor, as in (26), or if the predicate is lexically reflexive, as in (27). The role of the Chain Condition is illustrated in (28) and (29).

(28) **Oscar* haat *zich/hem*.

Oscar hates SE/him

(29) **Oscar* gedraagt *hem*.

Oscar behaves him

In (28) both *zich* and *hem* violate R&R's Condition B, but *hem* is worse than *zich*. In (29) Condition B is satisfied, just as in (27) with *zich*, yet *hem* is ruled out. (29), then, reflects just the effect of the Chain Condition. The same holds true of (30), where *hem/zich* are ECM subjects bound by a matrix antecedent.

(30) *Oscar* voelde [*zich/*hem* wegglijden].

Oscar felt SE/him slide away

(30) does not contain a reflexive predicate since *Oscar* and *zich/hem* are not coarguments. Therefore, both options are equally compatible with Condition B. However, as in (29) the *hem* option is ruled out.¹⁴

The pair (*Oscar*, *zich*) forms a chain. The Chain Condition requires that the head and only the head be fully specified for ϕ -features (person, gender, number, and structural Case). Here, the head is fully specified for ϕ -features. *Zich* is specified only for person, not for gender and number. Assuming coindexing, the pair (*Oscar*, *hem*) also forms a chain, but in this case the Chain Condition is violated, since both elements are fully specified (*hem* being specified for number and gender, in addition to person). Thus, the necessary distinction follows.

This sets the stage for the following question:

(31) How can the effects of the Chain Condition be derived?

In the remainder of this section I will focus on (31). The answer will in turn provide the basis for an answer to the following question raised in section 1.2:

(32) Why do reflexive predicates need special licensing?

This question will be discussed in section 6.

4.2 Syntactic Encoding of Anaphoric Dependencies

As indicated earlier, my main goal is to show that a syntactic encoding of interpretive dependencies that obeys the Inclusiveness Condition is in principle possible. I will therefore limit discussion as much as possible to those environments and subcases that are relevant for this goal.

¹⁴ Cases such as (30), just like *zich* in PPs, preclude any attempt to analyze *zich* as a nonargument.

Chomsky's MP approach limits the means available to express dependencies within C_{HL} .

- (33) a. The only ways to establish a dependency: Move/Attract and checking
 b. The only way to force a dependency: checking grammatical features in a checking configuration

The antecedent-antecedee relation by itself does not provide a checking configuration. This precludes reinterpreting R&R-type chains directly as MP-type chains. However, we can do so indirectly.

We know independently that a subject DP enters into a dependency with the I system, that an object DP enters into a dependency with the V system, and that the I and V systems are related by some dependency relation as well. Note that these dependencies are real and must be taken into account by any theory. Within an MP-style system the dependencies involved are implemented by checking relations; within the framework of Chomsky 2000, to appear, they are to a large extent encoded in the Agree relation. Here I base the analysis on the framework in Chomsky 1995, since its properties have been more thoroughly explored, but the essence should carry over to any framework allowing the syntactic encoding of the dependencies involved.

If these dependencies can be expressed, they will in principle allow composition. As we will see, composition yields a dependency between subject and object that can be interpreted only in case the object is not fully specified for ϕ -features. So, the basic picture is as follows:

- (34) DP I V pronoun
 └───┘ └───┘ └───┘
 R1 R2 R3

If and only if the pronoun is defective (a SE anaphor, or equivalent) will composing R1, R2, and R3 yield a composite dependency (DP, SE) that carries over as an interpretive dependency at the relevant level.¹⁵ In the next section I will present a precise implementation of this proposal within the framework of Chomsky 1995, given certain changes, which are independently justified.¹⁶

¹⁵ Note that conceptually little changes if one considers prepositional complements.

- (i) DP I V P pronoun
 └───┘ └───┘ └───┘ └───┘
 R1 R2 R3? R4

Whether a syntactic dependency between the pronoun and the DP can be formed depends on the nature of the relation between V and P. If the dependency between V and P is syntactically expressed (e.g., by covert movement), and assuming there is also a syntactic relation between P and the pronoun (e.g., by checking), composition can take place. If neither condition is met, no syntactic dependency between the pronoun and the subject DP can be formed.

¹⁶ The objects formed are effectively chains in the framework of Chomsky 1995, which is adopted here. This is clearly not the case in the extensions developed in Chomsky 2000, to appear. Although it is still possible to encode the relations under discussion syntactically, under the approach envisaged there the absence of feature movement precludes encoding them as chains. In general, the approach taken in Chomsky 2000, to appear, raises far-reaching questions about the syntax-semantics interface, and specifically about the computational structure of the interpretive component, which merit separate discussion (see Chierchia 1999 for discussion of highly pertinent facts). For the sake of concreteness I limit myself to the framework of Chomsky 1995, in the expectation that the results obtained bear directly on the question of how narrow narrow syntax is, or how syntactic the interpretive component can or must be.

4.3 Chains and Checking

Chomsky (1995) states the following assumptions about lexical items and their features:

(35) *Lexical items and their features*

- a. Lexical items are associated with a set of grammatical features (formal features).
 - i. In the lexicon lexical items are listed with inherent features (e.g., person and gender for N).
 - ii. Upon insertion into the numeration, optional features are added (e.g., number and Case for N, person and number for V).
- b. Features are of two kinds: interpretable (e.g., number for N) and uninterpretable (e.g., Case for N, all ϕ -features for V).
- c. At the interface the uninterpretable features must be erased.
- d. Movement is triggered by an attracting feature.
- e. Covert movement moves formal features only.
- f. The features of a complement move at most as far as (the features of) its head.

Chomsky (p. 297) assumes that feature movement is governed by attraction as in (36).

- (36) K *attracts* F if F is the closest feature that can enter into a checking relation with a sublabel of K.

There is no separate checking operation. Being in a checking relation simply has the following automatic effects:

- (37) a. A checked feature is deleted when possible.
 b. A deleted feature is erased when possible.

Intuitively, (37) expresses that checking takes place as soon as a checking configuration has been established. The consequence of being in a checking relation is that as many features are deleted/erased as possible. (I will follow Chomsky in taking erasure to be the standard for uninterpretable features.) *The core syntactic dependency is that between two ‘‘occurrences’’ of a feature, one being deleted/erased by the other.* Syntactic dependencies between constituents are thus derivative on dependencies between features they contain.

With Chomsky, I will assume that ‘‘possibility’’ in (37) is to be understood relative to other principles of UG. Specifically, a checked feature cannot delete if deletion contradicts the *principle of recoverability of deletion* (PRD). As Chomsky points out, the PRD will not bar an uninterpretable feature from erasing. Effectively, *being in a checking configuration* entails *deletion/erasure up to recoverability*.

For reasons that will become clear below, we will have to allow dependencies based on occurrences of features that are both interpretable. Yet Chomsky (1995) states that, as a consequence of the PRD, interpretable features cannot be deleted. If so, we must either find a significant relation between feature occurrences other than deletion/erasure or reject the claim that interpretable features can never be deleted. Here I will pursue the latter possibility, since, perhaps surprisingly, it is fully consistent with all relevant assumptions.

Note that the claim that interpretable features cannot be deleted entirely depends on the PRD. Consequently, nothing bars deletion of an interpretable feature if no violation of the PRD results. As we will see, the PRD can in fact be met for certain interpretable features (though, crucially, not for all). It may be useful to add that these features are not necessarily visible for attraction, since there is never a need for them to be deleted. (Since for what I have to say about interpretable features the weaker notion of deletion suffices, I will take *deletion* as the standard term for these cases.)

I will now show how the possibility of a syntactic encoding of interpretive dependencies between anaphors and antecedents can be derived. I will base my exposition on the structure in (21), the relevant aspects of which are given in (38). In (38) antecedent-trace relations are indicated by subscripts (for conventional reasons I will occasionally use the term *trace*, although from the perspective of current theory *copy* would be more appropriate). For the implementation to be general, we must distinguish two cases: one in which V-to-I movement applies in the overt syntax (yielding an Icelandic-type structure) and another in which V-to-I movement is a covert operation (as in Dutch subordinate clauses). In all cases I will abstract away from operations such as ‘‘verb raising,’’ V-to-C movement, and object scrambling (which I will assume is not Case driven). For uniformity of exposition I will use a Dutch vocabulary in Icelandic-type structures as well as in Dutch-type structures. Note that also in examples with covert V-to-I movement any resemblance to actual Dutch sentence structures will be mostly superficial.

I will base the discussion on a structure with overt V-to-I movement, since this structure makes the exposition simplest. Later I will discuss covert V-to-I movement and show that the complications it involves do not affect the result obtained for overt V-movement.¹⁷

4.3.1 Overt V-to-I Movement When V-to-I movement is overt, (39) results from (38) by first adjoining *voelde* ‘felt’ to I and then moving *Oscar* to [Spec, IP]. For present purposes we may abstract away from the finer articulation of the V/I system into light *v*, Agr_O, Asp, Agr_S, T, and so on. Such articulation is immaterial, since, by assumption, the finite verb will end up in the highest position anyway. (Throughout, adjunction structures are represented by a label of the form [_{X,X}·])

(38) [—[I [Oscar [_{voelde}_{+fin} [_{zich} I [_{wegglijden}_{−fin}]]]]]]
 Oscar felt_{+fin} SE slide away_{−fin}

(39) [Oscar [[_{I,I} voelde_{+fin} I] [_{t_{Oscar}} [_{t_V} [_{zich} I [_{wegglijden}_{−fin}]]]]]]]

Next consider the effect of Case checking by *zich*. Assuming that Case is a weak feature, checking takes place in the covert syntax, after all overt movements have taken place. As noted by Chomsky (1995:304), the trace of the moved V is not a possible target for movement; hence, the formal

¹⁷ Currently, there is extensive discussion of the nature of Dutch clause structure, and of SOV structure in general (see, e.g., Zwart 1997, Koopman and Szabolcsi 2000). There is no reason to assume that these approaches prevent a syntactic encoding of the dependencies studied in the present article.

features of *zich* (FF_{zich}) must move higher, adjoining to the matrix V/I complex.¹⁸ The pair (FF_{zich} , *zich*) has the properties of an A-chain, since both positions are L-related and FF_{zich} is nondistinct from an X^{max} (see Chomsky 1995:270–276 for discussion).¹⁹

As discussed earlier, *zich* is characterized as having only D- and 3rd person features; it has no gender or number feature. The effect of movement is represented in (40), where FF_{zich} contains only a D-feature and a person feature.

- (40) [Oscar [[_{LI} FF_{zich} [_{LI} voelde_{+fin} I]] [_{toscar} [_{tv} [*zich* I [*wegglijden* –_{fin}]]]]]]]

We know independently that *Oscar*, having raised to [Spec, I], checked and erased the verb's ϕ -features, since these are uninterpretable. This happened as soon as *Oscar* moved into [Spec, I]. The verb's features were visible to *Oscar* as they constitute a sublabel of I. One of the verb's features that was checked and deleted is the feature for 3rd person. Note now that FF_{zich} contains a 3rd person feature as well. After FF_{zich} adjoins to the V/I complex, the latter again contains a 3rd person feature. Checking applies blindly. As discussed below (37), it is merely the existence of a checking configuration that is required for checking to take place. The 3rd person feature of *Oscar* will check any occurrence of 3rd person that it stands in a checking configuration with. Thus, the category and person features of *zich* will also be checked. Given (37), this leads to deletion of these features and establishment of a formal dependency, provided no violation of the PRD ensues.

4.3.2 Checking *zich*'s Features As we know, both features of *zich* (D- and 3rd person) are inherent (see the assumptions listed in (35)). They are also interpretable. The question is, then, whether deleting them violates the PRD.

The concept behind the PRD is that deletion is possible provided an interpretively equivalent copy of the deleted element is retained. In other words, no information may be lost. In the case of deletion of lexical elements this requirement can never be satisfied. If some lexical item LI has been selected twice in a numeration, each instance may be assigned a different interpretation. Hence, trivially, one instance of LI cannot perform the role of two. However, by their very nature, formal features such as category and person features are interpretive constants. The contribution they make to interpretation is not contextually determined (for person features, at least within one reportive context). All occurrences of such features are therefore interchangeable. Therefore, if we have a pair $\langle F_C, F_C \rangle$ and one member is used to delete the other, the remaining member can take over the role of the deleted one in full. In other words, different occurrences of such features are indeed just copies of one another. It appears, then, that in the framework of Chomsky

¹⁸ Note that Chomsky (1995) must assume generalized pied-piping of the verb and any functional material it picks up as it raises. If the verb were allowed to excorporate, intermediate functional material would still constitute a potential target for other movements, contrary to what must be assumed. At this point I leave open how, precisely, pied-piping of intermediate functional projections takes place.

¹⁹ An anonymous reviewer expresses the concern that an analysis allowing the features of the object to raise as high as I for checking purposes may cause a mix-up in checking of subject versus object features. For extensive discussion about how such a mix-up is avoided, see Chomsky 1995:370ff.

1995 nothing bars deletion of the D- and 3rd person features in FF_{zich} under identity with the person and D-features of *Oscar*.

If so, according to (37) these features will be deleted. However, given their contribution to interpretation they must be recovered. It is this recovery that expresses that there is a dependency between *Oscar* and FF_{zich} . Note that this is a real dependency enforced by (37) together with the PRD. Since Move/Attract has already created a dependency between FF_{zich} and *zich*, the result is a dependency between *Oscar* and *zich*. This dependency is mediated by FF_{zich} and established by the checking of FF_{zich} 's features by *Oscar*. Deletion of a feature F_α in DP_1 and recovery of F_α under identity with F_α in DP_2 is tantamount to treating F_α in DP_1 and F_α in DP_2 as copies, and in fact as occurrences of the same feature in the sense of the notion ‘‘occurrence’’ in Chomsky 2000:115. This operation is therefore conceptually similar to the operation Agree in Chomsky 2000, to appear, which copies feature values into feature matrices that are underspecified, and in fact returns to a much more traditional view of syntactic dependencies. I will briefly come back to this later in this section.²⁰

4.3.3 Linking In order to be explicit about the relation between this formal dependency and the chain dependency formed by Move/Attract, I will define the notion of *checking chain*, abbreviated as *Chain*, formed by checking/deletion, in addition to *chain*.

(41) *Chain*

(α , β) form a Chain if (a) β 's features have been (deleted by and) recovered from α , and (b) (α , β) meets standard conditions on chains such as uniformity, c-command, and locality.

(42) If (α , β) is a Chain, and both α and β are in A-positions, (α , β) is an A-Chain.

Note that, under this definition, not all pairs (α , β) such that one deletes a feature of the other qualify as Chains. For reasons to be made clear below, (41) singles out those cases where β 's features are exhaustively deleted (and recovered). However, since (41) is just a definition, no theoretical cost is involved. (I will leave open whether other significant relations can be encoded in a manner not meeting the definition of a Chain. This is in principle possible, but need not concern us here.)²¹ Note also that there is no recovery without previous deletion; hence, *deleted by* is redundant and can be omitted. Applying these definitions, the pair (*Oscar*, FF_{zich}) in (40) can be said to form an A-Chain.

There is no significant difference between this case and the result of feature movement. The uniformity condition is met, just as for the pair (FF_{zich} , *zich*). C-command and locality are satisfied as well. The same reasoning that makes (FF_{zich} , *zich*) an A-chain also makes (*Oscar*, FF_{zich}) an A-Chain.

²⁰ Agree could also be used to express the dependency between an anaphor and its antecedent, in such a way that the antecedent fills a gap in the feature matrix of the anaphor (essentially the view defended in R&R 1991). This, however, would not carry over to the binding behavior of 1st and 2nd person pronouns, to be discussed shortly. I will defer further discussion of possible alternatives to another occasion.

²¹ Thanks to Tanya Reinhart for helpful discussion.

A-Chains are similar to A-chains, since the objects they consist of have the same syntactic types (DP, ϕ -feature bundles). Chains differ from chains in two respects. (a) Chains have been derived by checking instead of movement. (b) In Chains the full DP c-commands a head-adjoined ϕ -feature bundle; in chains either the head-adjoined ϕ -feature bundle c-commands the DP or the chain consists of a DP and a copy (trace).

Given this, the proposal for chain linking developed by Chomsky and Lasnik (1993) provides a straightforward means to compose the relevant syntactic dependencies. Slightly adapting their definition, let us allow A-Chains to be linked with A-chains, as in (43), calling these objects *CHAINs*.

- (43) If (α_1, α_2) is a Chain and (β_1, β_2) is a chain and $\alpha_2 = \beta_1$, then $(\alpha_1, \alpha_2 / \beta_1, \beta_2)$ is a CHAIN.

If linking applies to the objects (α_1, α_2) and (β_1, β_2) , the member to be eliminated is α_2/β_1 . The ensuing CHAIN is (44).

- (44) (α_1, β_2)

In the next section I will discuss how CHAINs compare with chains. Independent of the outcome of this discussion, the present argument already establishes an important result: *SE anaphors enter into a real dependency with their antecedents within C_{HL}* . This gives us part of what is needed to demonstrate that there is a syntactic relation that meets the conditions on the relation *R* of (25). However, we must also derive that pronominals cannot enter the same relation with an antecedent.

To this end, consider (45), where binding of the pronominal *hen* by *de jongens* is not allowed.

- (45) **De jongens* voelden *hen* wegglijden.
the boys felt them slide away

Up to checking, the derivations are equivalent. The relevant structure is (46), with FF_{hen} representing the formal features of *hen*.

- (46) [de jongens [[_{L,I} FF_{hen} [_{L,I} voelden_{+fin} I]] [t_{de jongens} [t_v [hen I [wegglijden_{-fin}]]]]]]]

FF_{hen} contains category, person, gender, and number. As noted earlier, category, gender, and person are inherent. Number as a nominal feature, however, is both interpretable and optional. Number is like a lexical element; different occurrences of it in the numeration make independent contributions to interpretation. As can be easily seen, the contribution each occurrence of number makes is highly context dependent. Consider an example such as *The times were rough. Men were betraying men (and women were betraying women)*. Whereas features such as category, person, and gender have identical effects on the interpretation of the two occurrences of *men* and even the contributions of the set expressions of the two occurrences of *men* are identical, the two occurrences of *men* may, even must, pick out different sets of individuals, with potentially different cardinalities. Hence, the contribution of the two occurrences of plural on *men* must differ.

Context dependence can also be seen by comparing the respective contributions of plural in *I saw no men* and *I saw men*, or in *Mary was wearing pants yesterday* and *Mary was wearing dresses yesterday*. Similar cases can easily be constructed for singular, as in *A lion is a mammal* versus *A lion caught a snake*. Therefore, the interpretation of a number feature cannot in general be recovered on the basis of some occurrence used to delete it. Thus, its deletion would violate the PRD. Hence, although the subject will be in a checking relation with FF_{hen} , this will not lead to the deletion of (features of) FF_{hen} . Therefore, no dependency is established between the subject and FF_{hen} , and consequently none is established between the subject and *them* in its English equivalent either.²²

So, nothing more than conceiving of the PRD as a real, contentful principle is needed to derive the asymmetry between pronouns and anaphors with respect to syntactic binding.

4.3.4 Features and Feature Bundles In comparing CHAINS with chains, a number of assumptions will be clarified. In line with Pesetsky 2000, I will assume that features are visible for attraction, and so forth, but that the objects to be interpreted are always feature bundles that have an independent status in C_{HL} . Within C_{HL} ϕ -feature bundles (such as pronominals, SE anaphors) correspond to morphological objects. Furthermore, ϕ -feature bundles, but not the individual ϕ -features, correspond to variables at the C-I interface. I will therefore assume that only ϕ -feature bundles can be manipulated by C_{HL} and enter syntactic dependencies that can be interpreted. Consider, for instance, (46). I argued that no dependency between *de jongens* ‘the boys’ and *hen* ‘they’ can be formed since establishing a CHAIN would violate the PRD owing to the nature of the number feature. Yet *de jongens* and *hen* do share the features of category, person, and gender. From the assumption that interpretable dependencies can only be established between entire bundles of ϕ -features, it follows that no such dependency can be established between *de jongens* and *hen*, since identifying $\phi_{\text{de jongens}}$ and ϕ_{hen} violates the PRD and there are no identifiable linguistic objects in the structure corresponding to subparts of these bundles.²³ With *zich* instead of *hen* relevant conditions are met: ϕ_{zich} corresponds to a linguistic object that as such can depend on $\phi_{\text{de jongens}}$.

This brings us back to the discussion of (41), repeated here.

(41) *Chain*

(α , β) form a Chain if (a) β ’s features have been (deleted by and) recovered from α , and (b) (α , β) meets standard conditions on chains such as uniformity, c-command, and locality.

²² This view of the role of number goes beyond the requirement that the cardinality of the set picked out be > 1 . Even if the latter view could be maintained, some semantic differences remain. Denis Delfitto (personal communication) points out the following contrast between pronouns and common nouns. If pronouns are generally of type $\langle e \rangle$, number (PL or SING) will be of type $\langle e, e \rangle$, yielding a mapping $\langle e \rangle \rightarrow \langle e \rangle$. Since common nouns are of type $\langle et \rangle$, depending on whether the application of number yields $\langle e, t \rangle$ or $\langle et, t \rangle$, number in this case is either $\langle et, et \rangle$ or $\langle ett, et \rangle$, which is different.

²³ Thanks to an anonymous reviewer for raising this issue.

²⁵ This case was brought up by an anonymous reviewer.

the formulation of (41), a Chain cannot be formed; hence, no CHAIN and no interpretive dependency can be established in this manner.

4.3.5 CHAINS and chains Earlier we discussed how Chains and chains can be linked and form a CHAIN. The question is, then, how CHAINS relate to chains. Within chain theory as it is elaborated in the framework of Chomsky 1995, 2000, to appear, a reduction of CHAINS to chains requires careful scrutiny. If nouns (proper or common) are syntactically simplex, such a reduction is impossible. In this framework a chain can only be represented as a sequence (or set) of occurrences of some element α , where occurrences of α are identified in terms of their (differing) environments: an occurrence of α in K is the full context of α in K (see the discussion in Chomsky 2000:115). It is clearly impossible for *zich* in (40) to be an occurrence of *Oscar* or vice versa. However, if the ϕ -feature content of a noun is analyzable for C_{HL} , things are different. Assuming the same execution that enables one to identify occurrences of a lexical item α , abstracting away from differences in, for instance, Case, the anaphor *zich* and the ϕ -features of a DP to which it has become syntactically linked may well be identified as occurrences of the same ϕ -feature bundle. If so, CHAINS can indeed be reduced to chains.

Here, however, I will not elaborate on this, since for present purposes it is not crucial whether CHAINS are eventually reducible to chains. Minimally, we can assume that (44) is a CHAIN. CHAINS reflect a type of syntactic dependency that comes theoretically at no cost, and is real, irrespective of whether it can be further reduced. In the remainder of the discussion I will continue to use the term *CHAIN* for this type of dependency.

Thus, CHAIN formation resulting from checking and Move/Attract gives a precise reconstruction of the relation R in (25).²⁶ Hence, for the moment, we can replace (25) by (50).

²⁶ As is well known, SE anaphors and pronominals are in free variation in Dutch locative PPs (see, e.g., Everaert 1986). We know independently that languages may vary in the way in which the Case systems of the verbs and prepositions are linked, reflecting the structural-inherent contrast. For instance, Hoekstra (1991) shows that in Frisian a preposition assigns inherent Case to its complement independent of the verb (see Reuland and Reinhart 1995 for further discussion). A difference between German and Frisian is that in German the Case of the complement of the preposition is not determined by P alone, as witnessed by the contrast between (i) and (ii).

- (i) Er warf das Buch ins Zimmer.
he threw the book in the room (ACC)
'He threw the book into the room.'
- (ii) Er warf das Buch im Zimmer.
he threw the book in the room (DAT)
'He threw the book (while being) in the room.'

In German, Case features of the complement of P are therefore in a sense dependent on the verb. Whereas this by itself does not determine a specific implementation (although a form of covert P-to-V movement seems reasonable), it definitely shows that a type of syntactic dependency V-P-complement is established obligatorily. This tallies with the fact that in German the anaphor *sich* is obligatory, as in (iii).

- (iii) Er legte das Buch neben sich/*ihn.
he put the book next to him

The obligatory dependency between V and P, then, serves as a vehicle for the dependency $DP \dots sich$.

Given this, it is sufficient to assume that Dutch is in-between German and Frisian, in that the Case of the complement of P may, but need not be, V-dependent (structural). Evidence to this effect is that the Dutch cognates of certain pronominal forms that are barred from Frisian PPs are allowed in Dutch PPs (Reuland and Reinhart 1995). Such an in-between status

(50) *Rule BV: Bound variable representation* (to be revised)

NP A cannot be A-bound by NP B if replacing A with C, C an NP such that B heads an A-CHAIN tailed by C, yields an indistinguishable interface representation.

In section 5 I will discuss how both Rule I and Rule BV fall under a more general principle, but first I briefly discuss structures with covert V-to-I movement.

4.3.6 Covert V-to-I Movement The main complication in the case of covert V-to-I movement resides in the internal articulation of the I system. With overt V-to-I movement, the formal features of the object will be attracted by V within the highest I element, whatever the internal structure of the I system, since the successive traces of V are invisible (assuming pied-piping of the intermediate functional material). In the case of covert V-to-I movement we may wish to make sure that the formal features of the object indeed end up high enough to be checked by the subject. Let us assume, then, that ‘V-to-I’ movement is covert and that there is an articulated I system. Since qualitative differences can be abstracted away from, I will represent the I system as I_1 - I_n , where I_1 stands for the highest element (T) and I_n for the lowest element (perhaps light v). I assume that I_1 has a strong EPP-feature, triggering overt movement of the subject, as indicated in (51).

- (51) [Oscar [I_1 - I_n [_{t_{Oscar}} [voelde_{+fin} [zich I [weggliden_{-fin}]]]]]]]
 Oscar felt_{+fin} SE slide away_{-fin}

Thus, *Oscar* has moved to [Spec, I_1] overtly, but covert operations such as V(-to-I) movement have yet to take place. What about V-movement? Although Chomsky (1995) does not explicitly discuss covert V-movement in more articulated I systems, it is clear that the verb should not be able to skip intermediate positions such as v and Asp. Allowing intermediate positions to be skipped would dissociate covert V-movement from overt V-movement. This would be unmotivated, since in fact, in overt and covert V-movement alike, all inflectional elements reflect different aspects of the verb and are best viewed as together forming the extended V projection in Grimshaw’s (1991) sense.

of the Dutch system, which would have to be acquired on the basis of rather subtle evidence, is supported by the considerable interspeaker variation in this area.

For the sake of concreteness we may assume an implementation in which a V-P dependency is reflected by covert head movement of the preposition, adjoining to the governing verb (but keeping its own Case feature, barring pseudopassives). If it moves, its Case feature becomes part of the verbal complex, and when the latter moves up to I, P will be able to attract from that position the Case feature of its complement. The resulting structure shares the relevant properties with the structure discussed above, and a CHAIN between subject and P complement can be formed, hence is preferred, as indicated in (iv).

- (iv) DP FF_P-V-I [... v ... [_{PP} P *hem/zich]]

In the alternative derivation FF_P does not move up. Hence, no CHAIN between DP and the complement of P can be established; hence, there is no preference.

- (v) DP V-I [... v ... [_{PP} P hem/zich]]

Whether or not *zich* is preferred over *hem* is only evaluated with respect to a derivation that is kept constant in other respects. For the evaluation of the options in (v) it is irrelevant that a chain could have been formed if P had adjoined to V as in (iv). Thus, the coexistence of pronominal and SE anaphor is accounted for.

Details of execution will depend on specific theoretical assumptions. If one may assume some principle like the Head Movement Constraint, the successive adjunction of V's formal features to intermediate positions on the way up to I_1 is enforced. However, as Chomsky (1995: 307) notes, its status as a general principle is dubious in the MP. Alternatively, each of the intermediate inflectional elements must carry a weak feature triggering the required movement. I will take the latter route: each I_i ($1 > i > n - 1$) has a weak feature I_{i+1} , reflecting the fact that it selects I_{i+1} . Covertly, then, triggered by $I_1 - I_n$'s weak features, the matrix verb's formal features FF_V , successively adjoining to the intermediate positions, end up adjoined to I_1 .

The first step of covert V-movement will now adjoin FF_V to I_n , to the left of t_{oscar} , as in (52).

- (52) [Oscar [$I_1 \dots I_{n-1}$ [$[I_n, I_n]$ FF_V I_n] [t_{oscar} [voelde_{+fin} [zich I [wegglijden_{-fin}]]]]]]]

We may assume that the Case of *zich* will be checked in the lowest I position. If so, (53) will result (as discussed earlier, *zich* is characterized as having only D- and 3rd person features, and FF_{zich} contains only a D-feature and a person feature).

- (53) [Oscar [$I_1 \dots I_{n-1}$ [$[I_n, I_n]$ FF_{zich} [I_n, I_n] FF_V I_n] [t_{oscar} [voelde_{+fin} [zich I [wegglijden_{-fin}]]]]]]]

In this position FF_{zich} is not in a checking configuration with *Oscar*. However, by assumption, I_n is attracted by I_{n-1} and adjoins to it, and so on. In order to obtain a configuration in which FF_{zich} is checked by *Oscar*, movement of I_n has to carry FF_{zich} along. In fact, if some instance of I_n is to move, there are two candidates: either its minimal instantiation, I_n proper, or its maximal instantiation, [I_n, I_n] FF_{zich} [I_n, I_n] FF_V I_n], assuming that intermediate instantiations are invisible for Move. Even if otherwise allowed, moving the former would entail that FF_V remains stranded, leaving the uninterpretable features of FF_V unchecked. (Note that the economy argument against pied-piping does not apply here, since all features involved are formal features.) The only possibility is that it is the largest instance of I_n that moves, moving along FF_V and, as a consequence, FF_{zich} as well. If so, all formal features within $\langle I_n, I_n \rangle$ will move along and end up adjoined to I_1 , which for reasons of legibility I will simply represent as follows:

- (54) [Oscar [[I_1, I_1] FF_{zich} [I_1, I_1] FF_V I]] [t_{oscar} [voelde_{+fin} [zich I [wegglijden_{-fin}]]]]]

After FF_V adjoins to the highest element in the I complex the latter contains the ϕ -features of the finite verb as a sublabel, but also, as in the case of overt V-to-I movement, the 3rd person feature of FF_{zich} . This configuration is similar to the one discussed earlier. Again, checking applies blindly as soon as a checking configuration obtains. Mediated by FF_{zich} , a CHAIN will be formed between *Oscar* and *zich*, but not between *Oscar* and a pronominal. Thus, the results obtained for structures with overt V-movement carry over unchanged to structures with covert V-movement.

4.4 First and Second Person Pronouns

The relation between checking and the PRD discussed above explains a hitherto puzzling property of 1st and 2nd person pronouns. It is well known that there is a contrast between 1st and 2nd

person pronouns and 3rd person pronouns with respect to local binding (see Burzio 1991). In all Romance languages and most Germanic languages 1st and 2nd person pronouns, unlike 3rd person pronouns, appear to be immune to the Chain Condition, allowing local binding. Compare:

- (55) a. *Oscar voelde hem wegglijden.
 Oscar felt him slide away
 b. Oscar voelde zich wegglijden.
- (56) a. Ik/Jij voelde mij/je wegglijden.
 I/you felt myself/yourself slide away
 b. Wij/Jullie voelden ons/je wegglijden.
 we/you felt ourselves/yourself slide away

So far this has been a puzzle for all versions of the binding theory. Generally, it has been either ignored or stipulated away by stating that 1st and 2nd person pronouns are ambiguous between being anaphors and being pronominals. True as this may be in some sense, the question remains why it should be so. One might entertain the possibility that 1st and 2nd person pronouns are always referential and cannot be bound variables. However, this position is untenable since these pronouns allow variable binding, as demonstrated in (57).

- (57) a. Wij voelden ons wegglijden en jullie ook.
 we felt ourselves slide away and you too
 b. wij λx (x voelden (x wegglijden)) & jullie λx (x voelden (x wegglijden))

Therefore, 1st and 2nd person pronouns must be allowed to enter CHAINs. I will argue that this contrast with 3rd person pronouns correlates with a difference in the conditions on their interpretation and more specifically with a difference in their specification for number. It has been argued (Benveniste 1966, Kayne 1995) that the 1st person pronouns *I* and *we* do not stand in a grammatical number opposition to each other: *we* does not denote a plurality of I's (speakers). In all cases the number of 1st and 2nd person pronouns is *inherently* specified. (In 2nd person number is not an obligatory grammatical category, but it may be specified inherently.)²⁷ Most crucially, the

²⁷ More generally, one may speak of the *orientation* of the utterance within the associated coordinate system. (See Reuland 2000a for more discussion.) For convenience I summarize the tentative implementation of the notion of inherent number given in Reuland 1996.

Assume that any speech event is associated with values for speaker and addressee. This yields a binary feature system for "person," with the following possibilities:

- (i) a. [+speaker, –addressee] → 1st person
 b. [–speaker, –addressee] → 3rd person
 c. [–speaker, +addressee] → 2nd person

Let [–speaker, –addressee] abbreviate as [other]. Now, (ia) is an inherent singular, but [+speaker, +addressee] yields a plural: inclusive *we*. This is not "the plural of" *I*. Plurality is determined by the lexical feature composition, not grammatically marked. Exclusive *we* is [+speaker, +other]. Again, plurality follows from the lexical features; it is not an optional grammatical feature.

Following Benveniste (1966), one may assume that [–speaker, +addressee] is inherently singular, or unmarked for number. An inherently plural 2nd person can be specified as [+addressee, +[other]]. (Note that this specification is structured; hence, no contradiction between positive and negative atomic feature values arises.)

Number is not determined by the values [–speaker, –addressee] for 3rd person in (ib). Therefore, for 3rd person pronouns number is an optional feature, and its interpretation is free, as we have been assuming.

interpretations of different occurrences of the same pronoun are not independent, but are determined by the parameters of the speech event in terms of source/speaker (1st person) and goal/addressee (2nd person). All occurrences of *ik/mij* have the same value in a given sentence. For *wij/ons* the same holds true; within the same sentence it is impossible for an occurrence of *wij* to refer to a different collection of individuals than *ons*. This entails that checking and deletion of number in 1st and 2nd person pronouns is not barred by the PRD. For 1st person this is illustrated in (58).

- (58) [ik/wij [[_{I,I} FF_{mij/ons} [_{I,I} FF_V I]] [t_{ik/wij} [voelde_{(n) + fin} [mij/ons I [wegglijden_{-fin}]]]]]]
 I/we felt me/us slide away

Under the standard movement and checking mechanisms, the formal features of the 1st person subject of the ECM clause covertly adjoin to the matrix I for reasons of Case checking. But this time, after deletion the interpretation of the number feature is fully recoverable from the element used to delete it. Hence, CHAIN formation takes place as required.

Note that 2nd person pronouns have slightly different properties from 1st person pronouns, yet in crucial respects they are equivalent. According to Benveniste (1966), the notion of an addressee does not imply a number contrast. If for some 2nd person form number is unspecified or specified inherently, we have the case of (58): checking by the subject, with CHAIN formation, is possible. (I take it that this is the case in the majority of Germanic and Romance languages.) However, there is a contrast with 1st person pronouns: whereas a plurality of I's is pragmatically odd, a plurality of you's is not. If so, it is still possible that some language marks number on a 2nd person pronoun by syntactic means. If this happens, we predict that such a marked form cannot enter a CHAIN with the subject. This is borne out.

In Dutch the 2nd person pronoun object form has two shapes: *je*, which can be used for both singular and plural (and for subject and object), and *jou*, which is explicitly singular and can only be used as an object form. It has always been a puzzle why, unlike (59a), (59b) is ill formed (compare (58), which has also bound tonic object pronouns yet is fine).

- (59) a. Jij voelde je wegglijden.
you felt you slide away
b. *Jij voelde jou wegglijden.

We see now how this follows. The form *jou* is grammatically marked accusative. This marking is optional (given the existence of *je*), and, in addition to Case, it marks number (unlike, for instance, German *dich*, which is only inherently marked as singular). But then, it realizes a situation where the PRD blocks checking and deletion of its features by the subject. Therefore, no CHAIN is formed; and, in accordance with (50), the form *je*, which tolerates CHAIN formation, must be chosen.

4.5 Binding versus Logophoricity

We now return to the question in (11) about binding and logophoricity, repeated here.

- (60) Why, under certain conditions, is logophoric interpretation of anaphors blocked?

The logic of Rule I is that the coreference option is blocked when the bound variable option is available with the same result. The logic of Rule BV (50) is that the option of binding a pronoun is blocked if the same result can be obtained by CHAIN formation (which requires using an anaphor instead). Using a similar logic, we should formulate a rule specifying when logophoric interpretation is blocked. Logophoric use is a kind of pronominal use. (See Thráinsson 1991 and Reuland and Sigurjónsdóttir 1997 for cases where the “logophor” is interpreted as a bound variable just like any pronominal.) What should be blocking pronominal use is the possibility for the anaphor to be interpreted in some other way. What should be blocked is the canonical way for such an anaphor to be interpreted, namely, by CHAIN formation. This yields the interpretive condition (61).

(61) *Rule L: Logophoric interpretation*

NP A cannot be used logophorically if there is a B such that an A-CHAIN ⟨B, A⟩ can be formed.

Given the mechanism just described, whenever a CHAIN can be formed, it will be formed. Thus, whenever SE can be hooked up as a CHAIN link, this will block any other mode of interpretation. Conversely, we should find logophoric interpretations of SE if and only if a CHAIN-forming mechanism is blocked. Let us look at various cases.

4.5.1 Subjunctive A common view about the relation between the subjunctive and logophoricity is that the subjunctive extends the domain in which an anaphor may be bound (or signals that a last resort interpretation must be assigned). In the present view, however, there is only one role the subjunctive can have: it should block, for purely syntactic reasons, CHAIN formation between anaphor and antecedent.

Let us consider how this follows. It has been shown that subjunctives (of the Icelandic/Romance type) are licensed by an operator (see, e.g., Kempchinsky 1986, Manzini 1993).²⁸ Assuming this to be a morphosyntactic property of the subjunctive, this licensing relation must be syntactically encoded. Within the present framework encoding involves (covert) movement of the formal features of the V/I complex. Consider, then, the structure in (62), where Op is the relevant operator and the verb is marked subjunctive, and where V moves overtly into I as in Icelandic.

(62) Op [_{IP} Oscar [[_{I,I} FF_{sig} [_{I,I} V_{subj} I]]] [t_{Oscar} [t_V [sig . . .]]]]

Suppose Op (weakly) attracts the subjunctive. This may cause the full set of formal features in the V/I complex to move to Op. The resulting structure will then be as follows (omitting details):

(63) [Op, Op [_{I,I} FF_{sig} [_{I,I} FF_{vsubj} I]]_i Op] [_{IP} Oscar_φ . . . [[δ] V_{subj_i}] . . . sig_φ . . .]

Irrespective of certain details of the execution, CHAIN linking will be blocked. Under a movement analysis all formal features have been removed from the V/I position δ between *Oscar* and *sig*.

²⁸ Manzini's analysis does not apply to the German subjunctive, which is not operator licensed. Consequently, one need not expect subjunctive to license logophors in German.

There is an alternative derivation, in which feature movement applies only to FF_{vsubj} . Since subjunctive is morphologically encoded on the V, it is possible for just FF_{vsubj} to move to Op , leaving the other formal features in the position of the V/I complex behind. (Note that the argument requiring pied-piping in (53) does not apply here, because of the direct relation between V_{subj} and Op .) If this route is taken, *sig* is able to enter a CHAIN with the subject, and a binding relation obtains. Hence, in this case one expects to find the usual complementarity between *sig* and the pronominal *hann* ‘him’. This expectation is borne out (Sigga Sigurjónsdóttir, personal communication).²⁹

Note that the present approach has direct implications for the issue of whether verb-second (V2) phenomena in Germanic (V/I-to-C movement) fall under the LF or PF part of the grammatical system. If V2 were an LF phenomenon, we would expect logophoric interpretation to abound in root clauses of V2 languages. It does not. On the contrary, in many of them, which lack subjunctive, there is hardly any logophoric interpretation of SE anaphors at all. Therefore, with Chomsky (1995) I will posit that V2 in Germanic is a PF phenomenon. In the absence of clear interpretive effects of V2, this seems entirely straightforward.

(64) * $[\text{ik } [_{I,I} \text{ FF}_{\text{zich}} [_{I,I} \text{ FF}_V \text{ I}]] [\text{t}_{\text{ik}} [\text{voelde}_{+\text{fin}} [\text{zich I } [\text{weggliden}_{-\text{fin}}]]]]]$
 I felt SE slide away

²⁹ I am indebted to Tanya Reinhart (personal communication) for bringing this case to my attention.

a logophoric interpretation of *zich* to be possible, an incorrect result. The situation has all the characteristics of leading to a canceled derivation in the sense defined in Chomsky 1995:309. A canceled derivation is like a convergent derivation in that it blocks any less optimal derivation (Chomsky 1995:309). How, then, can a combination of checking and Move/Attract lead to a canceled derivation in (64) without incorrectly ruling out a sentence such as *Ik voelde hem wegglijden* with *hem* instead of *zich*?

The answer follows from the properties of the different types of features involved. FF_{zich} contains a D-feature and a person feature (3rd person). FF_{hem} contains the same features and in addition a number feature (singular). (It also has a gender feature, which we need not discuss.) Although these are all interpretable, they exhibit a contrast, as we have already seen. The D-feature and the person feature are interpretive constants; both contribute to the interpretation in a manner independent of their position in the numeration. All occurrences of such features are interchangeable (for person features, at least within one reportive context), which is why they can be shared, as the PRD requires when one occurrence is deleted.

This is not true of the number feature of the pronominal. Different occurrences in the numeration receive independent interpretations, as we have seen; hence, the PRD prevents deletion. (Perhaps this may be considered a last reflex of the traditional notion of an index.) Therefore, in the *ik ... zich* case there could have been a CHAIN if the features had matched (i.e., there is “almost” a CHAIN); in the *ik ... hem* case there could not have been a CHAIN even if the features had matched. Hence, in the former case the effect of a canceled derivation obtains, whereas in the latter case CHAIN formation would violate a fundamental principle of grammar. Hence, it is not even considered; there is no CHAIN, not even a canceled one.³⁰

³⁰ This discussion can be made more precise along the following lines. Following Chomsky (1995:309), let us distinguish between a checking configuration and a checking relation. (For the motivation of this distinction, see the original discussion in Chomsky 1995.) Suppose *K* attracts *F*, which raises to form $\{H(K), \{F, K\}\}$. Each feature of $FF[F]$ including *F* is in the checking domain of each sublabel *f* of *K*. At this point (i) will be taken to hold.

- (i) Feature *F'* of $FF[F]$ is in a *checking configuration* with *f*; and *F'* is in a *checking relation* with *f*, if, furthermore, *F'* and *f* match.

Consider now the difference between (iia) and (iib).

- (ii) a. *Ik* (FF_{zich}) *voelde zich* ...
 b. *Ik* (FF_{hem}) *voelde hem* ...

(Note, incidentally, that $FF_{zich/hem}$ and FF_V , despite being sublabels of the *I* complex, are different feature bundles and hence may have a different fate.) According to Chomsky's assumptions, in (iia) there is a checking configuration, but no checking relation, *although there could have been one if the features had matched*. (The italicized condition is precisely what characterizes when a derivation is canceled.) In (iib) there is a checking configuration; there is no checking relation, *and (on our assumptions) there could not have been one even if the features had matched*. As this italicized clause expresses, since the existence of a checking relation would violate a fundamental principle of grammar—namely, the PRD—the option of checking is not considered. There is no CHAIN, not even a canceled one.

An anonymous reviewer wonders why the derivation *must* be canceled because of feature mismatch between *ik* and *zich*, since there is no feature in (60) that is left dangling whose checking remains unsatisfied. All we need is the preference for syntactic encoding expressed in Rules L (61) and BV (50) and a strictly derivational view of syntactic and interpretive processes. Assume a bottom-up procedure for the formation and interpretation of syntactic objects in which all decisions are made as soon as possible. Given a sentence with a pronoun (SE anaphor or pronominal), Rule L says first to launch a syntactic procedure to assign the element an interpretation, that is, to link it up as a CHAIN tail. The task here is to determine what makes (i) ... 1st SUBJ SE different from (ii) ... 1st IND SE and the latter, in turn, different from (iii) ... 1st IND PRON. In cases (i) and (iii) there can be no CHAIN for general reasons. Hence, an alternative procedure

4.5.3 SE as a Subject It has always been a puzzle why in Icelandic a VP-internal nominative argument cannot be an anaphor. This is so, regardless of whether it would have a logophoric or a bound variable interpretation. However, since a SE anaphor is not required to have a binder, the same problem arises for nominative SE anaphors higher up in [Spec, TP]. We know independently that a possessive anaphor within a DP occupying a nominative position can be bound (Everaert 1992). Also, there is no general prohibition against anaphors in nominative position (Anagnostopoulou and Everaert 1999). Clearly, then, some aspect of the specific relation between the SE anaphor and finite inflection is involved.

Suppose a nominative anaphor occupies the highest specifier position, as in (65).

(65) [SE [T + V_{fin} [. . .]]]

This structure is ruled out, since SE, lacking number, will not be able to check and erase all uninterpretable features of V_{fin}. Hence, the possibility of a logophoric reading for SE will not arise.

Suppose SE occupies nominative position in a construction with an expletive or a quirky subject, as in (66).

(66) [XP [T + V_{fin} [. . . SE_{nom} . . .]]]

The XP will in any case have checked T's EPP-feature, which yields a dependency with the V/T complex. However, according to Taraldsen (1995:310), quirky subjects never agree with the finite verb (for reasons that are not entirely clear, but need not concern us here); because they lack certain features, the same holds true for expletives. Since other DPs in the position occupied here by SE may show agreement with the V/T complex, the following possibilities arise: (a) The V/T complex has a full set of ϕ -features (as in the case where a nominative DP would show full agreement). For convergence, SE must then check the ϕ -features (by covert movement); when SE fails to delete number, the derivation crashes as required. (b) The V/T complex has a set of ϕ -features with default values (see also Chomsky 2000:127, where it is suggested that some unspecified reduction strategy may apply). If so, further deletion is not required, but we now obtain a mismatch between V/T's and SE's ϕ -features, the former being *reduced/impersonal*, the latter being *personal*. This results in a canceled derivation along the same lines discussed in section 4.5.2. Hence, neither a bound nor a logophoric interpretation is possible, and the structure is ruled ill formed, as required.³¹

can be initiated. In case (ii) there could have been a well-formed CHAIN if the features had matched. Instead, there is a feature mismatch in precisely the sense discussed by Chomsky: interpreting SE by forming a CHAIN link fails since it gives rise to an illegitimate syntactic object. Therefore, we are not allowed to pursue the less optimal alternative of assigning it an interpretation by nonsyntactic means. In other words, *blocking an interpretive procedure within C_{HL} is final*. This consequence can immediately be understood in terms of limiting computational space, if not within C_{HL} proper, then within a somewhat broader system.

³¹ As is well known, the Chinese anaphor *ziji* and the Japanese anaphor *zibun* may appear in the subject position of tensed clauses. This is consistent with the analysis developed here, since there do not seem to be independent reasons to assume that such languages have an agreement system with ϕ -features that must be deleted for convergence.

This concludes the argument showing that the relation R can be implemented as a formal dependency within the framework of Chomsky 1995. The semantic consequence of $a R b$ is that b is dependent on a for its interpretation (equivalent to a bound variable structure at the relevant semantic level).³²

4.6 Summary

I have characterized a relation R that holds between SE anaphors and their antecedents but not between pronominals and their antecedents, which is syntactically encoded as a CHAIN relation. The CHAIN relation obeys the Inclusiveness Condition, as required. The CHAIN relation was defined in terms of properties of movement and checking assumed in Chomsky 1995. The only difference between the system proposed here and the system developed in Chomsky 1995 concerns the PRD. It is claimed that the PRD allows deletion of interpretable features just in case the copy used to delete is interpretively equivalent. Under this interpretation the PRD is a somewhat weaker condition than under Chomsky's, but closer to conceptual necessity.

5 Interpretive Conditions Explained

5.1 Comparing Interpretive Procedures

We have seen that, limiting ourselves to minimalist assumptions, we can characterize the relation R in the original version of Rule BV, (25), as the composition of checking and Move/Attract, as in (50), repeated here.

(50) *Rule BV: Bound variable representation*

NP A cannot be A-bound by NP B if replacing A with C, C an NP such that B heads an A-CHAIN tailed by C, yields an indistinguishable interface representation.

I will now show that the preference expressed in (50) need not be stipulated, but can be derived from more general properties of the language system.

First, note that the first clause of (50) merits further discussion. We no longer have a traditional notion of binding in terms of coindexing. The only independent notion of binding we have is the logical syntax notion given in (2), repeated here.

(2) *A-binding* (logical-syntax-based definition, Reinhart 2000)

α A-binds β iff α is the sister of a λ -predicate whose operator binds β .

The question arises, What is the status of the level at which (2) can be expressed? Clearly, a derivation of expressions with λ 's does not obey the Inclusiveness Condition. Yet we know

³² The configuration *SE F DP*, which fails to establish a Chain and CHAIN given the impossibility of exhaustive deletion, is reminiscent of the expletive-associate relation. In the latter case a defective element that by assumption has only a D-feature is in a checking configuration with the formal features of the associate (the associate's features must be visible on the V/I complex owing to agreement/Case). Since the D-feature may end up being shared, a type of dependency may be established, although not a Chain as defined here. Given that expletive and associate do stand in a real relation, the result that a syntactic dependency exists is correct. Since the expletive should not end up as a variable at the interface, the fact that the dependency does not qualify as a Chain/CHAIN is also correct. Further investigation of various types of syntactic dependencies seems worthwhile, but leads beyond the scope of an article.

independently that some properties of sentences can only be expressed at a level of representation that violates this condition.

Consider, for instance, the contrast between distributive and collective predicates. As discussed in R&R 1993, a contrast between *We elected me* and *??We voted for me* has been noted in the literature. *Elect* is collective, but *vote for* is more easily construed as distributive. Hence, *We voted for me* entails one instantiation of the *vote for* relation that is reflexive and hence subject to R&R's revised Condition B. *We elected me* does not entail a reflexive instantiation. However, the relation between *We voted for me* and its entailment *x voted for x* cannot be established without violating the Inclusiveness Condition.

This property of reflexive entailments is clearly linguistic, not a property that one would wish to attribute to general systems of thought. In fact, such contrasts are most naturally handled at the C-I interface. The conclusion is warranted that, like the mapping to the PF interface, the mapping to representations at the C-I interface does not obey the Inclusiveness Condition (see the discussion in Chomsky 1995, 2000, to appear). Henceforth I will assume that expressions reflecting λ -abstraction or some equivalent mechanism are available at the C-I interface, or, minimally, that we can use the devices of logical syntax to generalize over C-I interface expressions and their properties.

This necessitates the following refinement of the relation between C_{HL} and the language of thought (Chomsky 2000:91). Chomsky defines a language L to be a device that generates expressions $Exp = \langle Phon, Sem \rangle$, where *Phon* provides the instructions for sensorimotor systems, and *Sem* for systems of thought. On the basis of this, C_{HL} can be defined as generating expressions $Exp' = \langle Phon', Sem' \rangle$ that obey the Inclusiveness Condition. The C-I interface, then, contains a translation procedure T , which maps Sem' onto Sem (on the sensorimotor side some similar procedure or procedures are assumed).

For reasons of space, I will not elaborate on such a translation procedure (but see Heim 1993, Reinhart 2000). All that is needed for current purposes are the following conventions:

1. An expression $DP [\dots t \dots]$ is translated as $DP (\lambda x (\dots x \dots))$, or any alphabetic variant (in general, we will say that vbl_{DP} is the variable of the λ -expression derived by translating DP).
2. A SE anaphor (bundle of ϕ -features) is translated as a variable (in general, we will say that vbl_{SE} is the variable the translation procedure assigns to SE).
3. A pronominal (also a bundle of ϕ -features) either is translated as a variable (vbl_{PRO}) or undergoes QR and is treated as a DP.
4. If XP is CHAIN-linked to DP , their ϕ -features are copies. If so, $vbl_{XP} = vbl_{DP}$ (in particular, $vbl_{SE} = vbl_{DP}$).

On this basis we can formulate the following more explicit form of Rule BV:

(67) *Rule BV: Bound variable representation* (final form)

T may not translate an expression E' in Sem' with syntactically independent NPs A' and B' into an expression E in Sem in which A is A-bound by B , if there is an expression E'' resulting from replacing A' in E' with C' , C' an NP such that B' heads an A-CHAIN tailed by C' and T also translates E'' into E .

We formulated the condition in (61), repeated here, to express when anaphors can(not) receive a logophoric interpretation.

(61) *Rule L: Logophoric interpretation*

NP A cannot be used logophorically if there is a B such that an A-CHAIN $\langle B, A \rangle$ can be formed.

Both rules have been modeled on Grodzinsky and Reinhart's (1993) Rule I, repeated here.

(20) *Rule I: Intrasentential coreference*

NP A cannot corefer with NP B if replacing A with C, C a variable A-bound by B, yields an indistinguishable interpretation.

All three rules express that, other things being equal, one way of assigning an interpretation to some element is preferred over another. I will now elaborate on this.

Together these three rules imply a ranking: processes within C_{HL} proper are less costly than processes involving the C-I interface, and these in turn are less costly than processes involving the discourse storage. It is *prima facie* possible that there are intrinsic differences between the workings of each of these components. It appears to be uncontroversial that the operations of C_{HL} (narrow syntax) are subliminal. They are automatic, hence, plausibly, cheap. Computations within the interpretive component (broad syntax/semantics) may well be generally more costly. They appear to be automatized to a considerably lesser extent, witness the problems speakers encounter processing and interpreting complex quantificational structures. The same has been argued for processes involving the discourse storage (for a recent discussion, see Van Geenhoven 1998). Note that often the task of establishing a referent for some pronoun on the basis of preceding context requires processes that involve conscious access to various data structures, and hence may be slowed by nonlinguistic factors.³³ However, even apart from the possibility that there are intrinsic differences in cost between processes in each component, a relevant asymmetry can be established.

5.2 An "Economy" Perspective on Interpretation

Starting with Chomsky's earliest work, theorists have argued for an asymmetry within the language system that can be summarized as "syntax is generative." In minimalist terms, the core recursive property of language resides in C_{HL} .³⁴ This asymmetry is sufficient for an economy metric with the required properties.

³³ Krämer (2000) investigates the acquisition of indefinites. She presents convincing evidence that in a scrambling language like Dutch, children master the various syntactic options before they master the correct interpretation, and that the interpretation for indefinites they master first is precisely the one they can compute without recourse to discourse information.

³⁴ The issue merits a more extensive discussion than I can present here. To my knowledge, the last extensive discussion appeared in Chomsky 1972, concluding that the recursive property of natural language resides in the syntactic component. In recent years this matter has not received much attention. Syntax-first strategies in language processing provide evidence from a different angle. Saddy (1999) and Piñango (2000), for instance, provide different types of evidence for a syntax-first strategy in adults with normal brain function on the basis of processing differences between adults with and without

Reconsider the relevant contrasts in (21) and (22), repeated in (68).

- (68) a. *Oscar* voelde [*zich* wegglijden].
 b. **Oscar* voelde [*hem* wegglijden].
 Oscar felt [him(self) slide away]
- (69) a. *Oscar*_φ voelde [*zich*_φ wegglijden]
 b. *Oscar* λ*x* (*x* voelde (*x* wegglijden))
 c. *Oscar* λ*x* (*x* voelde (*a* wegglijden)) & *a* = *Oscar*

The contrasts can be summarized as follows:

1. In (69a) the dependency between the arguments is expressed within C_{HL} , by CHAIN formation indicated by the shared ϕ -features, yielding (69b) as the next step in the derivation.
2. In (69b) the dependency between the arguments is linguistically expressed in the bound variable structure (irrespective of whether it was encoded in C_{HL} or not).
3. In (69c) the dependency is not linguistically expressed at all, but can only be established by accessing the discourse storage.

Rule I expresses that, all things being equal, the route of interpreting (68b) via (69b) is taken, instead of interpreting (68b) via (69c), even though the derivation (68b) \rightarrow (69b) is ultimately blocked (by the further preference expressed by Rule BV).

Rule BV expresses that deriving (69b) syntactically from (68a) via (69a) by CHAIN formation is preferred over deriving (69b) from (68b).³⁵ It may be worthwhile to emphasize once more that the derivation yielding (69b) from (68b) does not crash. No property of C_{HL} is violated by translating (68b) as (69b). Hence, Rule BV cannot reflect nonconvergence of such a derivation. This is the correct result, because only if it converges can it block (69c).

Four types of linguistic processes for representing a relation between arguments can be distinguished:

- (70) a. Processes relating C-I interface representations to the discourse storage
 b. Processes applying at the C-I interface
 c. Processes relating syntactic representations to C-I interface representations
 d. Processes applying within C_{HL}

In order to derive the ranking involved in Rules I and BV, it is sufficient to assume that a detectable amount of cost is associated with cross-modular operations. This will allow us to state the economy ranking in terms of formal properties of the interpretive procedure.

agrammatic aphasia. I will not review the extensive literature on processing here (see, e.g., Frazier 1999 for an overview and discussion).

³⁵ If local binding of pronominals does not yield a crash within C_{HL} , both types of derivation should coexist within the system and a preference for one over the other is determined by the systems of use, in line with what happens in the case of Rule I. This predicts the possible existence of delayed Condition B effects in language acquisition with regard to bound variable anaphora as well. Such effects have indeed been reported (see, e.g., Hestvik and Philip 1997).

For expressions α and β the following cases are to be distinguished:

- (71) a. Discourse storage (values) a a
 \uparrow \uparrow
 x_1 x_2
 \uparrow \uparrow
 C_1 C_2
 α ... β
- b. Discourse storage (values) a
 \uparrow
 x_1 \leftarrow x_1
 \uparrow \uparrow
 C_1 C_2
 α ... β
- c. Discourse storage (values) a
 \uparrow
 x_1
 \uparrow
 C_1 \leftarrow C_1
 α ... β

If α and β are to be assigned the same value via the discourse storage, as in (71a), they represent different CHAINS and different variables. The number of cross-modular operations is 4. If α and β are to be related by variable binding, as in (71b), they are represented by different CHAINS but an identical variable. The number of cross-modular operations is 3; hence, this operation is cheaper. This derives the effect of Rule I. The cheapest derivation is shown in (71c): CHAIN formation creates one object to be translated as a variable. Only 2 cross-modular operations are required. Thus, when it comes to assigning a value to some element β , the cheapest way to do it is in the syntax (by linking it to some element α , creating a syntactic CHAIN), and the costliest way to do it is by interpreting it independently, accessing the discourse storage. Intermediate in cost is to do it in the interpretive process, turning it into a variable that is stored until it can be logically bound by an antecedent. If we keep the elements α and β constant, this metric gives Rule L; if we keep the envisaged representation in Sem constant, it gives Rule BV.³⁶

5.3 Discussion

Since Chomsky's (1995) extensive discussion of the role of economy considerations in linguistic theory there has been a growing awareness that incautious use may lead to computational blowup. Hence, the approach taken in Chomsky 2000, to appear, substantially limits look-ahead. Both for

³⁶ As Tanya Reinhart (personal communication) points out, this approach has implications that go beyond what has been established here. One would expect to find a preference for the interpretation of any element α by "blind" processes of C_{HL} , where there is competition, everywhere else in the grammar as well. To establish this would require a research project of considerably wider scope. Let it suffice for the moment to note that other instances conforming to this pattern have been reported. As argued by Authier (1998), the selection of expletive *ce* versus expletive *il* in French is an instance of precisely this sort. Acquisitional evidence regarding *there* (expletive *there* is acquired earlier than locative *there*; Schafer 1998) and indefinites (Krämer 2000) supports such a pattern. Further research will be necessary for a more complete understanding.

narrow and broad syntax the look-ahead in the present approach stays on the same order as in those works.

As discussed earlier, the point of departure for the present approach is the widely adopted assumption that the recursive property of human language resides in C_{HL} . Neither Rule BV nor Rule L affects the workings of C_{HL} proper. Therefore, the need to restrict the computational complexity of C_{HL} in order to avoid computational blowup does not a priori carry over to present concerns. However, it is easily seen that, although the notion of economy underlying Rule BV and Rule L is technically global, there is no danger of a computational explosion even in this domain. Consider first Rule BV. The features of a SE anaphor are a subset of the features of the corresponding pronominal. This entails that the comparison does not require selecting a different lexical item, but that the SE anaphor involved in the comparison can be constructed from information already available in the pronominal itself.

Assume that, as a structure develops by Merge and Move, a representation in Sem (reflecting variable binding relations) is constructed in parallel (see Reuland 1998). The comparison carried out by Rule BV requires that whenever T maps an expression in Sem' generated by C_{HL} onto an expression in Sem, the process checks whether a bound variable relation is established and if so, whether the potential binder is in a position such that it could head an A-CHAIN tailed by the bindee (if the latter were a SE anaphor). But this is entirely locally determined. If the binder of a variable x does not occupy the position of the first possible CHAIN link for x , a SE anaphor is not a viable alternative; hence, if the "first try" fails, no further computing is necessary. Note, perhaps superfluously, that we are not comparing different derivations of "the same interpretation," but minimally different derivations of the same *expression* in Sem.

The same holds true for Rule L. Whether or not there is, for some A, a B such that an A-CHAIN $\langle B, A \rangle$ *can* (in the sense discussed above) be formed is entirely locally determined. Hence, again, no danger of excessive computational complexity exists. Only Rule I does involve a clearly global evaluation. At this point I have little to add to the discussion in the literature cited.³⁷

³⁷ As should be clear by now, this analysis does not directly depend on substantive assumptions about differences in intrinsic cost of the processes within each of the components involved. However, it does raise the issue of whether such differences can be expected to exist, and if so, in which direction they would go. On a very general level, it is quite uncontroversial that the human organism allows a trade-off between autonomic processes and conscious control. Whereas people cannot consciously control their heartbeat, breathing and eye blinking are autonomic processes that can be consciously influenced, but only at a cost, and for some reason. If the reason ceases to exist, the autonomic system automatically takes over, and the processes are again regulated subliminally. From the perspective of the notion of economy, it seems quite appropriate to say that using the autonomic system to control breathing rate is more economical than using conscious control. But note that this concept of economy is global and compares different processes.

We need not doubt that various components of the systems of language use allow the same type of freedom. This entails that a similar concept of economy should at least be considered in a discussion of linguistic phenomena given the biological basis of language. Since no phenomenon wears its analysis on its sleeve, the possibility that global economy plays some role cannot be rejected on a priori grounds. The only issue is an empirical one: are there areas where it does play a role?

In the face of evidence that processes involving the discourse storage are intrinsically more costly than those pertaining to semantic objects, and if the same were to hold for operations within the semantic components as compared to operations with C_{HL} , general objections of a conceptual nature against global economy would entirely lose force. As noted before, there is evidence that this is indeed the case, from Reinhart 1983:chap. 10 through Van Geenhoven 1998 and Reinhart's (2000) modification of her (1983) position. From an acquisitional perspective, the guessing pattern accompanying the

6 The Contrast between SE and SELF Anaphors

Whereas the previous section discussed the relation between SE anaphors and pronominals, we still face the question of why natural language displays a contrast between simplex and complex anaphors. As the question was put in (32), repeated here:

(32) Why do reflexive predicates need licensing?

As noted in section 1.2, languages may use SELF-type elements as in various branches of Germanic, but duplication of the bound element, verbal affixes, “body parts,” and prepositional constructions are also used (Schladt 2000).³⁸

Each of these means warrants extensive study by itself. Since such a study lies far beyond the scope of an article, I will concentrate on just one case—namely, SELF anaphors—with an open eye for the implications this case holds for the others. The question we will focus on, then, is this:

(72) What is the role of SELF in licensing a reflexive predicate?

6.1 Interpreting CHAINS

From Chomsky 1981 on, it has been standardly assumed that syntactic A-chains correspond to semantic arguments. Compare (73a) with (73b).

- (73) a. He admires her.
b. She_i is admired t_i.

Whereas *admire* in (73a) is a 2-place predicate with two arguments, each syntactically realized in a different argument position, the two argument positions in the passive (73b) together realize one argument only. The agent remains unexpressed. Any semantics of (73b) should reflect this: the chain (*she*, *t*) is the overt argument of the predicate in (73b).

6.2 SE Anaphors and Chains

If checking leads to the formation of antecedent-anaphor CHAINS, what consequences does this have for semantic interpretation? Consider (74), where *Willem* and *zich* form a CHAIN (nothing hinges on the use of indices here).

delayed Condition B effect discussed by Grodzinsky and Reinhart (1993) is independent evidence that some process using up limited resources is involved. Any attempt to do justice to the extensive literature on the status of the delayed Condition B effect is well beyond the scope of this article. For present purposes these brief remarks must suffice.

³⁸ The use of body part reflexives is especially pervasive. Such reflexives are based on an element that occurs independently as a nominal head designating a body part such as *head* or *bones*; designations such as *soul*, *spirit*, and *reflection* are found as well. They often occur with a pronominal specifier. The relation may be understood as one of inalienable possession (Pica 1987, 1991).

- (74) Willem_i schaamt zich_i.
 Willem shames SE

Earlier we discussed two possible elaborations of the theory. In one elaboration, which requires assuming that ϕ -feature bundles are syntactic objects, CHAINs can be fully reduced to chains. Identification of the ϕ -feature bundles of *Willem* and *zich* entails that these are in fact occurrences of one another; hence, a chain is formed. Under this implementation the verb *schamen* has as its syntactic argument (two occurrences of) one syntactic object. Upon translation into Sem this yields one semantic object.

In the other elaboration the CHAIN relation expresses a syntactic dependency between *Willem* and *zich*. The existence of this syntactic dependency entails that under the mapping onto Sem (the set of expressions at the C-I interface), $\text{vbl}_{\text{SE}} = \text{vbl}_{\text{Willem}}$, as in (75).

- (75) Willem λx (x schaamt x)

(75) shows two occurrences of a variable, bound by the same operator and not distinguished by any property except their position. They are effectively copies of each other. Under the empirical assumption that Sem is a linguistic level, sequences of copies constitute a chain (given that structural conditions on chains are satisfied). Thus, both elaborations yield just one object within Sem. The verb *schamen* is inherently reflexive, hence must be interpreted as a 1-place predicate. Therefore, semantically the presence of only one argument is precisely the required result, and nothing more need be said. Thus, being a CHAIN, (*Willem*, *zich*) yields an object that upon interpretation yields the only semantic argument of *schamen*. (Upon proper consideration, this line of reasoning can be pushed even further. After translation into Sem, within the framework of Chomsky 1995 only terms (minimal and maximal categories) remain visible. Intermediate stages of projection are not. Unless one stipulates order, given the definition of occurrence in Chomsky 2000:115 this entails that occurrences of arguments that can be distinguished in syntactic structure become literally indistinguishable at the interface. If so, notations like $P(x, x)$ are in fact misleading. They effectively contain only one argument, to be interpreted by just one semantic object.)

Now consider an instance of a true transitive verb such as *haten* ‘hate’.

- (76) *Willem_i haat zich_i.
 Willem hates SE

Here too (*Willem*, *zich*) forms a CHAIN, which in turn is interpreted as one semantic argument. Since there is no other argument, it is the only semantic argument of *haten*. But *haten* must be interpreted as a 2-place predicate; hence, it needs two semantic arguments. As this requirement is not met, the sentence is ill formed.³⁹ Note that the ill-formedness does not reside within C_{HL} .

³⁹ Reinhart (to appear) discusses lexical operations on argument structure. Clearly, if in a certain language a lexical operation is available reducing the arity of a predicate, further licensing of a reflexive use of this predicate is not required. In such a case we will expect both the SE anaphor and the SELF anaphor to be possible. This is the case with predicates such as *verdedigen* ‘defend’ in Dutch, with subtle differences in the interpretation of the SE anaphor and the SELF anaphor. For reasons of space further discussion will have to be presented elsewhere.

The derivation does converge. There is just a mismatch between the syntactic structure and semantic properties of *haten*. In the next section we will discuss how adding a SELF morpheme helps to remedy this effect. But first consider a further case where no special marking is needed:

- (77) Jan_i voelde [_τ zich_i wegglijden].
 Jan felt [SE slide away]

(77) is well formed. The predicate is not inherently reflexive; in fact, it is not reflexive at all. Take a compositional interpretation procedure. *Zich* is combined with *wegglijden*. Within τ *zich* does not tail a chain. *Wegglijden* sees only one argument, namely, *zich*. Since it is a 1-place predicate, thematic conditions on its interpretation will be satisfied. Note that nothing prevents *zich* from counting as an argument, since ϕ -feature deficiency does not lead to uninterpretability, as we have seen. Therefore, locally, within τ , no condition is violated. Next consider the matrix clause. Since *voelen* is a 2-place predicate, it requires two arguments. One argument is *Jan*, the other is τ . *Jan* and τ are not coindexed, hence do not form a CHAIN. Therefore, upon interpretation, the binarity of *voelen* is respected.⁴⁰ The distribution of *zich* thus follows from the status of CHAINS/chains with respect to interpretation, and from the general requirement that interpretation respect the arity of predicates.

For this reasoning nothing hinges on the anaphoric status of the bound element. This can be seen by considering a language allowing pronominals instead of SE anaphors in local binding relations. In such a language the binding relation is not encoded in the syntax. (Since a derivation based on CHAIN formation is lacking, this derivation will not be blocked by (50)/(67).) Frisian is such a language, using pronominals where Dutch uses *zich*. At the interface the situation will be identical to the cases above.

Consider:

- (78) Willem skammet him.
 Willem shames him

Since there is no syntactic encoding of a dependency between *Willem* and *him*, translating (78) into Sem could in principle lead to either (79a) or (79b).

- (79) a. Willem λx (x shames x)
 b. Willem λx (x shames y)

(79b) is ruled out for semantic reasons: the verb *skamje* ‘shame’ has only one θ -role to assign, which leaves one of its arguments without a θ -role. The two occurrences of the variable x in (79a) form a chain, along the lines discussed above; they constitute one object, which is interpreted just like the Dutch case with a SE anaphor instead of a pronominal.

The same situation arises with verbs like *haatsje* ‘hate’, with the same consequence as in Dutch.

⁴⁰ The relation between chains and arguments within the framework of R&R 1993 was discussed in Fox 1993. Fox’s suggestion that chains may share their members with different predicates was adopted in R&R 1993. The present approach derives rather than stipulates this.

- (80) *Willem_i hatet him_i.
 Willem hates him

The coindexing representation of (80) corresponds to (81) at the interface (the alternative with the second argument free just leads to the standard interpretation of the pronominal).

- (81) Willem λx (x hates x)

Here too, (x, x) forms a chain; as a consequence, upon interpretation arity will not be respected. Therefore, (80) has the same status in Frisian as (76) has in Dutch. With respect to the need to license reflexive predicates, Dutch and Frisian are therefore identical.

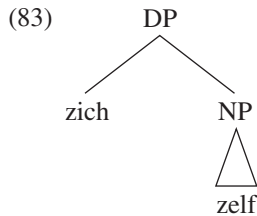
6.3 Preserving Arity

Let us return to Dutch and consider the effect of adding SELF.

- (82) Jan_i haatte zichzelf_i.
 Jan hated himself

(82) is well formed. The question is why. Since it *is* well formed, binding must be prevented from leading to an arity violation. I will now show how this is effected by SELF.

I will assume that the structure is (83) (in line with Helke's (1971) analysis for English).⁴¹



Let us assume furthermore that *zich* is the pronominal element to be coindexed with the antecedent, not *zelf* (leaving open for the moment at what level this dependency is encoded). Given all this, the relevant structure for (82) is (84).

- (84) Jan_i haatte [_τ zich_i [_N zelf]]

(84) is structurally similar to (77): the coargument of *Jan* is τ , not *zich*. Hence, the arity of *haten* is not violated.⁴² Note that at this point we will ignore the details of how a CHAIN/chain between

⁴¹ Note that little has to be changed if one assumes an alternative structure for English with *himself* as a syntactically simplex focus marker construed with a null pronominal (e.g., Solà 1994).

⁴² Of course, this analysis requires that *zich* and *zichzelf* not be coindexed in (i).

(i) Jan_i haatte [_τ zich_i [_N zelf]]

Apart from other considerations, note that coindexing would be ruled out in principle by the i-within-i Condition if this is a principle governing interpretation (see Chomsky 1986).

(ii) *[_i ... i ...]

zich and *Jan* is formed in (84). This depends on specific properties of determiners, possessors, and the SELF morpheme. A number of further questions arise: for example, what the role of D is with respect to Case checking, whether a specifier *zich* moves to I in the (covert) syntax, whether SELF incorporates into the verb (see, e.g., Anagnostopoulou and Everaert 1999 for discussion). These are empirical questions subject to more extensive investigation. We will come back to some of them in the next section.

In Frisian the SELF element has the same function as in Dutch.

- (85) a. Willem hatet himself.
 Willem hates himself
 b. Willem_i hatet [_τ him_i [_{N'} sels]]

Whereas in Dutch *zelf* already prevents an offending CHAIN/chain structure from arising within C_{HL}, in Frisian it is prevented from arising at the interface.

The interface structure that arises from SELF marking is given in (86).

- (86) NP λx (x hates f(x))

The verb takes two arguments, one identical to *x*, the other to the value of some function of *x*. This is, then, the essence of SELF marking as a protective strategy.⁴³

Note that this analysis does not rely on specific assumptions concerning the interpretation of SELF. Specifically, it does not require that SELF represent an identity predicate (see R&R 1991). Rather, from the perspective of the interaction between C_{HL} and the interpretive system, any element introducing a branching structure will do (for a similar conclusion, see Jayaseelan 1997). In section 6.4.2 we will see that construing SELF as an identity predicate along the lines of R&R 1991 avoids an arity violation in a different manner.

In the protective strategy such an element may be a duplicate of the pronoun, an element designating a body part, a focus marker, and so on. At this level of generality it is, then, immaterial whether the SELF element of SELF anaphors is a focus marker (as Jayaseelan (1997) argues for Malayalam and English; see also Solà 1994) or whether it is a head, implying that SELF anaphors

⁴³ R&R (1993) show that Condition B applies to semantic predicates. That is, it must apply at a level of representation where the distributive properties of predicates are reflected. Thus, (ia) is ill formed, since one of the *love* relations is reflexive and hence must be reflexive marked.

- (i) a. **Oscar loves Cindy and him*.
 b. Oscar λx (x loves Cindy & x loves x)

Just as in cases discussed in the text, (ia) can be saved by adding *self* to the pronoun.

- (ii) *Oscar loves Cindy and himself*.

This entails that the requirement that arity be preserved is a semantic, not a syntactic, requirement. One would expect that at the level of representation where the arity violation shows up, *himself* is no longer a syntactic element, hence, a fortiori, no longer syntactically complex. It must therefore be the case that (ii) is saved by virtue of having the interpretation in (iii).

- (iii) Oscar λx (x loves Cindy & x loves f(x))

No doubt, the nature of the level of representation where distributivity is represented requires more extensive study.

are modeled on body part reflexives. Of course, there are restrictions on the complexity marker that go beyond mere structure. It surely is no accident that the equivalent of *his head* is a possible anaphor, and the equivalent of *his table* is not. But these restrictions, discussed briefly in the next section, will follow from their semantics.

6.4 The Semantics of Protective SELF

Any analysis of SELF as a protective element has to deal with two issues. One is why SELF can be used to license a reflexive interpretation of a predicate. This is the issue we have been primarily dealing with so far. The other is why under certain conditions SELF must be used as a reflexivizer, even if this yields ill-formedness, whereas under other conditions it need not. This is the property that is reflected in Condition A of R&R 1993. It follows from our approach that these must be distinct properties of SELF, which need not even be related. Jayaseelan's (1997) discussion of reflexivity in Malayalam shows that this consequence is correct. Just as in English or Dutch, in Malayalam the bound element must be complex in local binding contexts. This is illustrated in (87a), which shows that local binding of *tan-ne* 'self' is possible only if it is doubled by *tanne*. But, unlike what is found in English and Dutch, this complex element does not require a local antecedent: the marker licenses a reflexive interpretation, but does not force it. This is shown by (87b), where *tan-ne tanne* in the embedded clause is bound by the matrix *Raaman*.

- (87) a. Raaman_i tan-ne_i *(tanne) sneehikunnu.
 Raman SE-ACC self loves
 b. Raaman_i wicaariccu [penkuttikal tan-ne_i tanne sneehikkunnu enno].
 Raman thought girls SE-ACC self love COMP
 c. *Penkuttikal tan-ne_i (tanne) sneehikkunnu.
 girls_{pl} SE-ACC_{sing} self love

That *tan-ne* is indeed an anaphor is shown by (87c), where a mismatch in number between *tan-ne* and its envisaged antecedent leads to ill-formedness. Any discussion of the role of SELF must then distinguish between its roles in licensing and forcing a reflexive interpretation. In its semantics, as well, these properties must be kept apart.

6.4.1 Protective SELF as a Licenser As we have seen, at the interface the structure of nonintrinsic reflexives with a protective element must be (88).

- (88) $x \text{ R } f(x)$

What about the semantics of *zelf* or *zichzelf* as a licensor of reflexive interpretation? The core of the issue is that the linguistic system must overcome the following conflict: on the one hand, the reflexivity of the predicate cannot be represented either in the syntax or at the interface without a violation of arity, and on the other, it must be possible to obtain interpretations with precisely this property. There is only one way for the system to meet both requirements: the interpretation of the second argument, $f(x)$, must approximate that of the first argument, x , without being formally

indistinguishable from it. This approximation must be close enough to x to be “useful.” In other words, $\|f(x)\|$ must be able to stand proxy for $\|x\|$ wherever necessary.⁴⁴

It is easily seen that the latter condition puts significant restrictions on the choice of the element to be interpreted as f . So it would seem that *body*, *head*, *soul*, and the like, are reasonable candidates. In order to prevent an arity violation in expressing a hitting act where hitter and hittee are the same, using an expression like *x hits x's body* is entirely adequate semantically. Of course, to what extent *x's body* is appropriate as a reflexive object in general depends heavily on the semantic transparency of the noun for *body* in such constructions. Clearly, the choice of the relevant head noun has been completely grammaticalized in many languages. However, given the approach advocated here, one should not be surprised to find languages in which the head of the reflexive actually varies with the selectional properties of the predicate. In fact, Papiamentu (spoken in the Antilles) is such a language (Muysken 1993, Muysken and Smith 1994).

Note that I am making a very strong claim, namely, that some aspect of the grammatical system is in fact dysfunctional: in language an obvious requirement on any communicative system—namely, that it can represent reflexive acts—can only be met by what looks like a trick. (Another possibility for resolving the conflict is to add a morphological marker on the predicate head, reducing its arity, thus equating its thematic structure with that of an intrinsic reflexive. This is the role of reflexive clitics in Romance (Reinhart, to appear). This may also be the role of the verbal affix *kol* in Kannada (Lidz 1995). For reasons of space, I defer discussion to another occasion.)⁴⁵

Ideally, this approach to licensing should also be motivated for SELF anaphors. The relevant evidence is found in contexts allowing both *zich* and *zichzelf*. Such contexts are provided by ECM constructions (see R&R 1993 for discussion). Under certain conditions the value of *zichzelf* can indeed be distinguished from the value of its antecedent, whereas the value of *zich* cannot. Such a contrast between *zichzelf* and *zich* is quite unexpected from the perspective of the standard binding theory.⁴⁶

⁴⁴ An anonymous reviewer wonders how to understand a function like f . If one takes body part reflexives as a general model for the interpretation of reflexives, the semantics is straightforward. In that case $\lambda x (x R f(x))$ reads as $\lambda x (x R B(x))$, where B is a function that for each x renders x 's body as its value. If *body* is taken literally, it would be a matter of pragmatics to account for its being able to stand proxy for x . Alternatively, *body* may be associated with an idiomatic meaning that allows $B(x)$ to be assigned some more abstract element as its value, which stands proxy for x .

⁴⁵ Approaches to reflexivity such as Keenan's (1988) in which reflexives are treated as detransitivizers appear to use this alternative as a basic model. The current discussion suggests that these approaches are not empirically equivalent, but reflect different options of UG.

⁴⁶ In the case of *X-SELF* there appear to be two options. Again (see footnote 44), both may be realized. This construction type can be subsumed under the second version of the body part analysis if an abstract entity SELF exists such that x 's SELF may stand proxy for x just as in other languages x 's body does. Alternatively, the value of x 's SELF is a set of elements such that they stand in some equivalence relation to x that allows each of its members to stand proxy for x . In that case one would need a choice function to pick out a particular member of that set. These are details, however, which neither C_{HL} nor BV structures much care about. Crucial is only that f maps x onto an object that may stand proxy for x . What objects may stand proxy for x may well be a matter more of convention than of computation.

Two illustrative contexts are given in (89) and (90).

(89) “*Madame Tussaud*” context⁴⁷

Consider the following discourse in Dutch: Marie is beroemd en liep bij Madame Tussaud’s binnen. Ze keek in een spiegel en

- a. ze zag zich in een griezelige hoek staan.
- b. ze zag zichzelf in een griezelige hoek staan.

Translation: Marie is famous and walked into Madame Tussaud’s. She looked in a mirror and

- a. she saw SE in a creepy corner stand. (i.e., she saw SE standing in a creepy corner)
- b. she saw herself in a creepy corner stand. (i.e., she saw herself standing in a creepy corner)

Favored interpretations:

- a. *zich* = Marie: Marie saw herself
- b. *zichzelf* = Marie’s statue: Marie saw her statue

(90) “*Münchhausen*” context⁴⁸

- a. De baron trok zich uit het moeras.
the baron pulled SE out of the swamp
- b. De baron trok zichzelf uit het moeras.
the baron pulled himself out of the swamp

Favored interpretations:

- a. Normal situation: the baron pulls himself out by grabbing a branch of a tree hanging over him
- b. The story situation: the baron pulls himself out by his hair

In both contexts *zich* gives an interpretation in which subject and object are identical. If *zichzelf* is chosen, subject and object are presented as distinguishable. In (89b) the distinction is effected by interpreting *zichzelf* as a *representation of Marie* rather than as *Marie* itself. In (90b) the baron is viewed as an agent distinct from his body.

In both cases the sentence with *zichzelf* expresses a relation between an x and an $f(x)$ that bears a systematic resemblance to x , but can be distinguished from it. This implies that the structure in (88) is not just an artifact of the analysis, but reflects a real property of *zichzelf* and its interpretation.

6.4.2 SELF as a Reflexivizer So far this analysis only explains the role of SELF as a protective element in obviating Condition B effects. We have not discussed why anaphors such as English *himself* or Frisian *himsels* are subject to Condition A, since unlike Dutch *zich* in *zichzelf*, here

⁴⁷ See Jackendoff 1992 for discussion of binding in this context from a different perspective.

⁴⁸ See Voskuil 1991.

the pronominal element need not be syntactically linked. Nor have we discussed how protection relates to earlier insights that SELF is essentially an identity predicate.

Safir (1996) investigates a wide array of types of anaphoric dependencies, including SAME, BODYPART, OTHER, OWN, and MET(onymy) (which includes SELF), and proposes that such elements all denote relations (SELF an identity relation). He essentially assumes that conditions on their interpretation derive from intrinsic semantic properties. Such an analysis is needed for contentful elements like SAME, OTHER, and OWN. If it holds for SELF as well, little more needs to be said.

R&R (1991) derive Condition A from a head movement analysis of SELF. SELF is interpreted as an identity predicate that adjoins to the predicate head, restricting its interpretation (as is independently motivated for compounds such as *self-admiration*). It reflexive-marks a syntactic predicate (R&R's (1993) Condition A) precisely in those environments where it is a syntactic argument of that predicate and where it is allowed to (covertly) adjoin to the head of the predicate. This excludes adjunct positions, coordinate structures, or focus (see R&R 1993 for further discussion). Covert adjunction leads to the LF representation in (91b).

- (91) a. DP ... [H] [PRON [SELF]]
 b. DP ... [SELF H] [PRON [e]]

For the corresponding logical syntax, consider a structure *pronoun-SELF* (where a dependency between the pronominal and the antecedent is not yet linguistically encoded). If SELF is a relational noun $\text{SELF}_{\langle x, y \rangle}$ that is interpreted as an identity relation and composes with the main predicate, we obtain the representations in (92) (see R&R 1991:286–291).

- (92) a. ... [$V_{\langle y, x \rangle}$... [... $\text{SELF}_{\langle x, y \rangle}$]]
 b. $\text{SELF}_{\langle x, y \rangle}$ & $V_{\langle y, x \rangle}$

Thus, the interpretation of the second argument of the SELF-marked head will be restricted to values of x . (91b) therefore may be assigned the logical syntax representation (93a)/(93b).

- (93) a. DP λx (hates (x , him) & him = x)
 b. DP λx (him λy (hates (x , y) & $y = x$))

This structure is both formally and interpretively reflexive, but arity is respected as well since at the relevant level the two arguments of *hates* are formally distinct.

We see, then, that the need for arity to be respected can be satisfied both by protection and by identification. Reflexive elements in different languages may vary with respect to whether they are used in one or the other of these strategies or in both.⁴⁹ The choice will also depend on the environment. In coordinate structures, for instance, the head movement/identification strategy is unavailable for syntactic reasons; hence, protection is the only option.

⁴⁹ The absence of configurationality effects of SELF marking discussed in R&R 1993 follows from the availability of a protection strategy, which is sufficient by itself when SELF is in subject position, but which also blocks unwanted chains in intermediate position.

At this point we could speculate about an intrinsic trigger for this type of head movement. The trigger could involve the semantics of SELF; but it could also involve Case deficiency, since *himself* lacks a structural Case contrast with nominative (see Reuland and Reinhart 1995). This may reflect a weak Case (De Hoop 1992) and enforce incorporation of SELF.

The simplest option is that no intrinsic trigger is involved at all. Head movement is independently available within C_{HL} . If it applies, it is effectively a syntactic encoding on the predicate of the dependency between its arguments. Hence, on the basis of the economy approach discussed, this way of encoding takes precedence. I will leave further discussion to another occasion.

7 Summary and Conclusion

In this article I have shown that locality conditions on binding follow from independent principles of (minimalist) syntax. Dependencies between simplex anaphors and their antecedents can be encoded in the form of syntactic CHAINS/chains, thus satisfying the Inclusiveness Condition. Complementarity between binding of pronouns, simplex anaphors, and complex anaphors follows from the interaction between independent subsystems of the grammar. To this end, the roles of C_{HL} , interpretive procedures, and accessing the discourse storage must be distinguished. Division of labor among these subsystems is governed by a general principle measuring cost by counting interpretive steps.

Whereas the encoding of dependencies is by itself a very general notion, which could even be stated without the specific technical assumptions made, languages may differ in the specific means they have available (such as Case sharing in languages such as Telugu (Dravidian) and Caxur (Dagestanian)). Discussion of such variation will, however, have to wait for another occasion.

Restrictions on CHAIN formation and checking explain the different properties of anaphors and pronominals. The syntactic environments where logophors are allowed in a language are precisely those where the syntactic encoding operations of that language cannot apply. The role of complex anaphors in licensing reflexivization follows from chains' being semantic arguments, together with the requirement that interpretation respect the arity of a predicate.

Appendix

One of the main theses of Reinhart and Reuland (R&R) 1993 is that reflexive predicates must be *reflexive marked*, either intrinsically or extrinsically (the revised Condition B). That is, reflexivity as a property of predicates must be *linguistically licensed*. As we saw in section 6, the reason is that in reflexivization structures the output of C_{HL} would otherwise violate requirements of argument structure. Thus, n-place predicates do not generally allow their reflexive instantiations to be realized as a logical syntax expression (94a); instead, they require a representation like (94b) where a SELF element “protects” the bound element from causing an arity violation.

- (94) a. $\lambda x [P(x, \dots, x, \dots)]$
 b. $\lambda x [P(x, \dots, f(x), \dots)]$

In the protection case $f(x)$ is assigned an interpretation that stands proxy for $\|x\|$. For such predicates (94b) is as close as one can get to a reflexive interpretation. In cases where for structural or thematic reasons a SE anaphor and a SELF anaphor are both allowed, a contrast in interpretation between (94a)- and (94b)-type cases may arise, as illustrated in (89) and (90). (See R&R 1993: fn. 51 and references cited there for earlier observations, and Reuland 2000b for further examples and discussion.) As noted, natural language grammar has a variety of tools to license reflexivity. The analysis presented here derives, without extra machinery, that reflexivity of predicates must be licensed, thus explaining R&R's Condition B.

Lidz (2001) also discusses these issues. Referring to an earlier version of this article, cited as Reuland 1995, Lidz too characterizes the relevant contrasts in terms of the structures in (94). He adduces a number of further observations from Kannada (and also Dutch) that show systematic contrasts along the lines of (94a) and (94b), thus confirming and extending the basic claim of the present work.

His article has two parts, discussing first the differences in the semantic interpretation of SE anaphors and SELF anaphors and then how Condition B may apply to predicates that require a plural object. Though the article contains very interesting facts and insights, the criticisms it voices are not convincing.

Lidz argues that the existence of the contrast in (94) is problematic for the approach taken in R&R 1993. He states that R&R's theory "erroneously" predicts that reflexive-marked predicates are *semantically uniform*, a prediction that would be violated by those cases for which the representation (94b) is necessary; in fact, according to Lidz, structures giving rise to (94b)-type representations are not reflexive at all. This objection is difficult to evaluate, however, because Lidz does not define this notion of semantic uniformity. Nor is it clear why this would be relevant. R&R (1993) define reflexivity in terms of *coindexing*: a predicate is reflexive iff two of its arguments are coindexed, and a predicate is reflexive marked iff (a) it is lexically reflexive or (b) one of its arguments is a SELF anaphor. Both of these statements are independent of whether or not predicates are, or should be, semantically uniform. Both (94a) and (94b) are logical syntax translations of expressions that are reflexive as defined. Although the contrasts discussed do show that the semantics of SELF is indeed more complicated than just being a restriction imposing identity on two arguments of a predicate as suggested by R&R (1993:659), no further conclusions are warranted.

Lidz, however, proposes to reinterpret the contrast between SE anaphors and SELF anaphors as one between *pure reflexives* and *near reflexives*, moving away from what he calls the predicate-centered approach of R&R 1993 to an approach in which the lexical content of the anaphor determines its interpretation. Since, in view of the facts discussed in R&R 1993 this change alone would lead to significant empirical problems, Lidz formulates a new condition, Condition R.

$$(95) \lambda x [P(x, x)] \leftrightarrow (\theta_1 = \theta_2)$$

It is impossible to evaluate Lidz's proposal on descriptive grounds, since he does not state precisely what further binding conditions are to supplement it and how the combination is to account for the range of facts captured by R&R. Moreover, in theoretical terms, whereas R&R

combine increased descriptive coverage with theoretical parsimony (note that the Chain Condition is independently motivated), Condition R is introduced as merely a new primitive condition, added to some existing version of the binding theory.

Also, it is unclear how Condition R is to be interpreted. According to Lidz's footnote 11, the right-hand part of (95) represents that the two θ -roles of the predicate are coindexed, but it remains unclear what indices on θ -roles are, or what it means for two roles to be coindexed. (The notation certainly cannot mean that the roles are identified.) It appears that in this case coindexing is merely a notation representing an unspecified relation between two θ -roles. That Lidz does not specify this relation is understandable, since a precise theory of the thematic differences between verbs of the *hate*-type (which in many languages appear to require protection under a reflexive interpretation) and verbs such as *defend* and *cut* (which do not) is still lacking. But given this, (95) says merely that structures of type (94a) are allowed if they are thematically licensed; it says nothing about why one would expect any specific licensing to be necessary at all. Hence, (95) offers no empirical or conceptual gain.

On pages 132–133 Lidz discusses two differences between his proposal and R&R's. On page 133 he rightly argues for the same position I adopt in this article and its precursor (Reuland 1995): the property of licensing reflexivity of a predicate and the property of requiring it must be distinguished, leading to a richer typology of morphological and syntactic licensors.

However, in the preceding argument starting on page 132 it is unclear whether a problem really exists. Under R&R's theory *zich* in *Max haat zich* 'Max hates SE' is obligatorily bound by *Max*. Hence, the predicate is reflexive, with the logical syntax representation (94a); that is, SE behaves like a pure reflexive in Lidz's sense and 'identity between arguments' obtains. Since reflexivity is not licensed (the predicate is reflexive, but not reflexive marked), the sentence is ruled out by the revised Condition B. Hence, instead, the alternative *Max haat zichzelf* with SELF marking and the logical syntax representation $\lambda x [\text{hate}(x, f(x))]$ (*Max*) must be used. So it does not follow that any further condition, such as Condition R, is needed.

Lidz argues that it is problematic for Condition B to apply to semantic predicates. The facts he presents are interesting and merit careful discussion. However, on close consideration they support, rather than undermine, R&R's approach. According to R&R, Condition B must apply to semantic predicates, as is illustrated in (96) (Lidz's (31)), where one of the instantiations of the semantic predicate *invite* violates Condition B as shown in (96c).

- (96) a. The queen invited (both) Max and herself for tea.
- b. **The queen* invited (both) Max and *her* for tea.
- c. $\lambda x [\text{invite}(x, \text{Max}) \ \& \ \text{invite}(x, x)]$ (the queen)

Lidz admits that the canonical binding theory is unable to account for this contrast, but claims that the following facts (his (33)) present a problem for R&R's approach:

- (97) a. *The queen separated the king.
- b. *The queen separated herself.
- c. The queen separated the king and herself.
- d. *The queen separated the king and her.

He states that the semantic structure of (97c–d) must be as in (98).

(98) λx [separate (x , the king & x)] (the queen)

Here, he argues, the second argument of *separate* is *the king & x*. The predicate cannot be distributed over its second argument; hence, it has no reflexive instantiation, Condition B cannot apply, and the bound pronominal in (97d) should be acceptable, contrary to fact.

This argument hinges on the assumption that (98) is the proper logical syntax representation of (97c–d). However, as the cases in (99) show, it is not.

- (99) a. The guardian separated the boys and the girls.
 b. The guardian separated the boys and the girls from the parents.
 c. The guardian separated the boy from the girl.

(99) supports the following observations: (a) *separate* requires a plurality as its object only if a *from*-phrase is lacking (compare (97a) and (99c)); (b) only if a *from*-phrase is lacking does *separate* entail splitting up the group of individuals denoted by the object. This shows that semantically *separate* is not a 2-place predicate with some plurality restriction on the object, as Lidz suggests. Rather, semantically it has three obligatory arguments. The requirement for a third argument can be syntactically satisfied by a *from*-phrase; or it can be met semantically by an object DP allowing a relevant partitioning.

I therefore submit that the semantic structure of the predicate *separate(-from)* (parenthesizing *from* indicates that it need not be phonetically realized) is (100a) and that sentences (97c–d) involve a reflexive instantiation, as in (100b).

- (100) a. separate(-from) (x , y , z)
 b. λx [separate(-from) (x , the king, x)] (the queen)

Here the predicate is in fact reflexive, and requires reflexive marking, entirely in accordance with R&R's Condition B (thanks to Bill Philip and Yoad Winter for helpful discussion of this fact).

In order for Lidz's argument to go through there should be verbs that are inherently collective on their second argument and yet require a SELF form. I know of no convincing examples of such verbs.

I conclude that the facts and considerations adduced by Lidz do not warrant his conclusions, but in fact provide further support for the approach taken in R&R 1993 and elaborated here.

References

- Anagnostopoulou, Elena, and Martin Everaert. 1999. Toward a more complete typology of anaphoric expressions. *Linguistic Inquiry* 30:97–118.
 Ariel, Mira. 1990. *Accessing noun-phrase antecedents*. London: Croom Helm.
 Authier, J.-Marc. 1998. When syntax overrules semantics. In *NELS* 28, 33–42. GLSA, University of Massachusetts, Amherst.
 Baauw, Sergio. 2000. Grammatical features and the acquisition of reference: A comparative study of Dutch and Spanish. Dissertation, Utrecht Institute of Linguistics OTS. LOT International Series 39. Landelijke Onderzoekschool Taalwetenschap, Utrecht.

- Baaui, Sergio, and Denis Delfitto. 1999. Coreference and language acquisition. In *Recherches de linguistique française et romane d'Utrecht XVIII*, 23–35. Utrecht Institute of Linguistics OTS.
- Benveniste, Emile. 1966. *Problèmes de linguistique générale*. Paris: Gallimard.
- Bouchard, Denis. 1984. *On the content of empty categories*. Dordrecht: Foris.
- Burzio, Luigi. 1991. The morphological basis of anaphora. *Journal of Linguistics* 27:81–105.
- Chierchia, Gennaro. 1995. *Dynamics of meaning*. Chicago: University of Chicago Press.
- Chierchia, Gennaro. 1999. Polarity phenomena. Paper presented at Issues in the Study of Language: A “State of the Art” Workshop. Certosa di Pontignano, November 26–27.
- Chomsky, Noam. 1972. *Studies on semantics in generative grammar*. The Hague: Mouton.
- Chomsky, Noam. 1980. On binding. *Linguistic Inquiry* 11:1–46.
- Chomsky, Noam. 1981. *Lectures on government and binding*. Dordrecht: Foris.
- Chomsky, Noam. 1986. *Knowledge of language: Its nature, origin, and use*. New York: Praeger.
- Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, Mass.: MIT Press.
- Chomsky, Noam. 2000. Minimalist inquiries: The framework. In *Step by step: Essays on minimalist syntax in honor of Howard Lasnik*, ed. Roger Martin, David Michaels, and Juan Uriagereka, 89–155. Cambridge, Mass.: MIT Press. [Also available as MIT Occasional Papers in Linguistics 15, MITWPL, Department of Linguistics and Philosophy, MIT, Cambridge, Mass.]
- Chomsky, Noam. To appear. Derivation by phase. In *Ken Hale: A life in language*, ed. Michael Kenstowicz. Cambridge, Mass.: MIT Press.
- Chomsky, Noam, and Howard Lasnik. 1993. The theory of principles and parameters. In *Syntax: An international handbook of contemporary research*, ed. Joachim Jacobs, Arnim von Stechow, Wolfgang Sternefeld, and Theo Vennemann, 506–569. Berlin: Mouton de Gruyter.
- Clements, G. N. 1975. The logophoric pronoun in Ewe: Its role in discourse. *Journal of West African Languages* 10:141–177.
- Epstein, Samuel David. 1994. The derivation of syntactic relations. Ms., Harvard University, Cambridge, Mass.
- Evans, Gareth. 1980. Pronouns. *Linguistic Inquiry* 11:337–362.
- Everaert, Martin. 1986. *The syntax of reflexivization*. Dordrecht: Foris.
- Everaert, Martin. 1992. Nominative anaphors in Icelandic: Morphology or syntax? In *Issues in Germanic syntax*, ed. Werner Abraham, Wim Kosmeijer, and Eric Reuland, 277–307. Berlin: Mouton de Gruyter.
- Faltz, Leonard M. 1977. Reflexivization: A study in universal syntax. Doctoral dissertation, University of California at Berkeley. [Distributed by University Microfilms International, Ann Arbor, Mich., and London.]
- Fiengo, Robert, and Robert May. 1994. *Indices and identity*. Cambridge, Mass.: MIT Press.
- Fox, Danny. 1993. Chain and binding: A modification of Reinhart and Reuland’s “Reflexivity.” Ms., MIT, Cambridge, Mass.
- Frazier, Lyn. 1999. *On sentence interpretation*. Dordrecht: Kluwer.
- Gelderen, Elly van. 2000. Bound pronouns and non-local anaphors: The case of Earlier English. In *Reflexives: Forms and functions*, ed. Zygmunt Frajzyngier and Traci Curl, 187–225. Amsterdam: John Benjamins.
- Grimshaw, Jane. 1991. Extended projections. Ms., Rutgers University, New Brunswick, N.J.
- Grodzinsky, Yosef, and Tanya Reinhart. 1993. The innateness of binding and coreference. *Linguistic Inquiry* 24:69–101.
- Hagège, Claude. 1974. Les pronoms logophoriques. *Bulletin de la Société de Linguistique de Paris* 69: 287–310.
- Heim, Irene. 1993. Anaphora and semantic interpretation: A reinterpretation of Reinhart’s approach. SFS report 07-93. University of Tübingen. [Reprinted in *MIT working papers in linguistics* 25: *The*

- interpretive tract*, 205–246. MITWPL, Department of Linguistics and Philosophy, MIT, Cambridge, Mass.]
- Helke, Michael. 1971. The grammar of English reflexives. Doctoral dissertation, MIT, Cambridge, Mass.
- Hellan, Lars. 1988. *Anaphora in Norwegian and the theory of grammar*. Dordrecht: Foris.
- Hellan, Lars. 1991. Containment and connectedness anaphors. In *Long-distance anaphora*, ed. Jan Koster and Eric Reuland, 27–49. Cambridge: Cambridge University Press.
- Hestvik, Arild, and Bill Philip. 1997. Reflexivity, anti-subject orientation and language acquisition. In *NELS* 27, 171–185. GLSA, University of Massachusetts, Amherst.
- Hoekstra, Jarich. 1991. Pronouns and Case: On the distribution of *har(ren)* and *se* in Frisian. Ms., Fryske Akademy, Ljouwert.
- Hoop, Helen de. 1992. Case configuration and noun phrase interpretation. Dissertation, Groningen University.
- Jackendoff, Ray. 1992. Mme Tussaud meets the binding theory. *Natural Language & Linguistic Theory* 10: 1–33.
- Jayaseelan, K. A. 1997. Anaphors as pronouns. *Studia Linguistica* 51:186–234.
- Jong, Jelly Julia de. 1996. The case of bound pronouns in peripheral Romance. Dissertation, Groningen University.
- Kayne, Richard. 1994. *The antisymmetry of syntax*. Cambridge, Mass.: MIT Press.
- Kayne, Richard. 1995. Agreement and verb morphology in three varieties of English. In *Studies in comparative Germanic syntax*, ed. Hubert Haider, Susan Olsen, and Sten Vikner, 159–167. Dordrecht: Kluwer.
- Keenan, Edward. 1971. Names, quantifiers and a solution to the sloppy identity problem. *Papers in Linguistics* 4.2.
- Keenan, Edward. 1988. On semantics and the binding theory. In *Explaining language universals*, ed. John Hawkins, 104–155. Oxford: Blackwell.
- Keenan, Edward. 2000. An historical explanation of English binding theory. Paper presented at SHELL 1, UCLA, May 27.
- Kempchinsky, Paula. 1986. Romance subjunctive clauses and Logical Form. Doctoral dissertation, UCLA, Los Angeles, Calif.
- Kimball, John. 1973. Seven principles of surface structure parsing in natural language. *Cognition* 2.1.
- Koopman, Hilda, and Anna Szabolcsi. 2000. *Verbal complexes*. Cambridge, Mass.: MIT Press.
- Krämer, Irene. 2000. Interpreting indefinites: An experimental study of children's language comprehension. Dissertation, Utrecht University/Max Planck Institut für Psycholinguistik, Nijmegen.
- Lidz, Jeffrey. 1995. Morphological reflexive marking: Evidence from Kannada. *Linguistic Inquiry* 26: 705–710.
- Lidz, Jeffrey. 2001. Condition R. *Linguistic Inquiry* 32:123–140.
- Manzini, Maria Rita. 1993. The subjunctive. *Paris 8 Working Papers*, Vol. 1.
- Menuzzi, Sergio. 1999. Binding theory and pronominal anaphora in Brazilian Portuguese. Dissertation, Holland Institute of Generative Linguistics. LOT International Series 30. The Hague: Holland Academic Graphics.
- Muysken, Pieter. 1993. Reflexes of Ibero-Romance reflexive clitic + verb combinations in Papiamentu: Thematic grids and grammatical relations. In *Focus and grammatical relations*, ed. F. Byrne and D. Winford. Amsterdam: John Benjamins.
- Muysken, Pieter, and Norval Smith. 1994. Reflexives in the creole languages: An interim report. In *Creolization and language change*, ed. D. Adone and I. Plag. Tübingen: Max Niemeyer Verlag.
- Pesetsky, David. 2000. *Phrasal movement and its kin*. Cambridge, Mass.: MIT Press.
- Pica, Pierre. 1987. On the nature of the reflexivization cycle. In *Proceedings of NELS 17*, 483–499. GLSA, University of Massachusetts, Amherst.
- Pica, Pierre. 1991. On the interaction between antecedent-government and binding: The case of long-distance reflexivization. In *Long-distance anaphora*, ed. Jan Koster and Eric Reuland, 119–137. Cambridge: Cambridge University Press.

- Piñango, Maria Mercedes. 2000. Canonicity in Broca's sentence comprehension: The case of psychological verbs. In *Language and the brain: Representation and processing*, ed. Yosef Grodzinsky, Lew Shapiro, and David Swinney, 330–354. San Diego, Calif.: Academic Press.
- Pollard, Carl, and Ivan Sag. 1992. Anaphors in English and the scope of the binding theory. *Linguistic Inquiry* 23:261–305.
- Reinhart, Tanya. 1983. *Anaphora and semantic interpretation*. London: Croom Helm.
- Reinhart, Tanya. 2000. Strategies of anaphora resolution. In *Interface strategies*, ed. Hans Bennis, Martin Everaert, and Eric Reuland, 295–325. Amsterdam: Royal Academy of Arts and Sciences.
- Reinhart, Tanya. To appear. *The theta system: Syntactic realization of verbal concepts*. Cambridge, Mass.: MIT Press.
- Reinhart, Tanya, and Eric Reuland. 1991. Anaphors and logophors: An argument structure perspective. In *Long-distance anaphora*, ed. Jan Koster and Eric Reuland, 283–321. Cambridge: Cambridge University Press.
- Reinhart, Tanya, and Eric Reuland. 1993. Reflexivity. *Linguistic Inquiry* 24:657–720.
- Reuland, Eric. 1996. Pronouns and features. In *NELS* 26, 319–333. GLSA, University of Massachusetts, Amherst.
- Reuland, Eric. 1998. Structural conditions on chains and binding. In *NELS* 28, 341–356. GLSA, University of Massachusetts, Amherst.
- Reuland, Eric. 2000a. Anaphors, logophors and binding. In *Long-distance reflexives*, ed. Peter Cole, Gabriella Hermon, and C.-T. James Huang, 343–370. Syntax and Semantics 33. San Diego, Calif.: Academic Press.
- Reuland, Eric. 2000b. The fine structure of grammar: Anaphoric relations. In *Reflexives: Forms and functions*, ed. Zygmunt Frajzyngier and Traci Curl, 1–40. Amsterdam: John Benjamins.
- Reuland, Eric, and Tanya Reinhart. 1995. Pronouns, anaphors and Case. In *Studies in comparative Germanic syntax*, ed. Hubert Haider, Susan Olsen, and Sten Vikner, 241–269. Dordrecht: Kluwer.
- Reuland, Eric, and Sigríður Sigurjónsdóttir. 1997. Long distance “binding” in Icelandic: Syntax or discourse? In *Atomism in binding*, ed. Hans Bennis, Pierre Pica, and Johan Rooryck, 323–340. Dordrecht: Foris.
- Saddy, Doug. 1999. Electrophysiological research of language: Normal and pathological processing. Paper presented at Workshop on Clinical Linguistics. 2nd Conference of the European Language Council. July 1–3, Jyväskylä, Finland.
- Safir, Ken. 1996. Semantic atoms of anaphora. *Natural Language & Linguistic Theory* 14:545–589.
- Schafer, Robin. 1998. Definiteness and children's interpretation of the locative anaphor *there*. Paper presented at the Boston University Conference on Language Development, November 6.
- Schladt, Mathias. 2000. The typology and grammaticalization of reflexives. In *Reflexives: Forms and functions*, ed. Zygmunt Frajzyngier and Traci Curl, 103–124. Amsterdam: John Benjamins.
- Sells, Peter. 1987. Aspects of logophoricity. *Linguistic Inquiry* 18:445–479.
- Solà, Jaume. 1994. A uniform analysis for SELF elements. Ms., Groningen University.
- Taraldsen, Tarald. 1995. On agreement and nominative objects in Icelandic. In *Studies in comparative Germanic syntax*, ed. Hubert Haider, Susan Olsen, and Sten Vikner, 307–327. Dordrecht: Kluwer.
- Thornton, Rosalind, and Kenneth Wexler. 1999. *Principle B, VP ellipsis, and interpretation in child grammar*. Cambridge, Mass.: MIT Press.
- Thráinsson, Höskuldur. 1991. Long-distance reflexives and the typology of NPs. In *Long-distance anaphora*, ed. Jan Koster and Eric Reuland, 49–76. Cambridge: Cambridge University Press.
- Van Geenhoven, Veerle. 1998. *Semantic incorporation and indefinite descriptions: Semantic and syntactic aspects of noun incorporation in West Greenlandic*. Stanford, Calif.: CSLI Publications. [Distributed by Cambridge University Press.]
- Voskuil, Jan. 1991. Comments on “Reflexivity.” Ms., University of Leiden.

- Wexler, Kenneth, and Yu-Chin Chien. 1985. The development of lexical anaphors and pronouns. In *Papers and reports on child language development* 24, 138–149. Stanford University, Stanford, Calif.
- Zribi-Hertz, Anne. 1989. A-type binding and narrative point of view. *Language* 65:695–727.
- Zwart, C. Jan-Wouter. 1997. *Morphosyntax of verb movement: A minimalist approach to the syntax of Dutch*. Dordrecht: Kluwer.

Utrecht Institute of Linguistics OTS

Trans 10

3512 JK Utrecht

The Netherlands

eric.reuland@let.uu.nl