1 *Long-distance anaphora: an overview*

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1 Introduction

One of the major foci of linguistic research during the last decade has been the development of a theory of binding. Despite a reasonable amount of consensus on major issues, there are a number of persistent anomalies. Especially, an integrated view of so-called long-distance anaphors is lacking. The present book sets out to contribute to the development of such a view. In the individual chapters a number of important issues in the theory of local and long-distance anaphors are analysed. The purpose of this overview is to summarize and interpret the results. In section 2 we provide the necessary background. Section 3 summarizes the individual contributions and puts them into context. Section 4 presents an overview of the facts reported. Section 5 discusses a major result of the book as a whole: the existence of just two main classes of A-anaphors.

2 Binding theory and its parameters

The starting point of most current discussions of anaphora is the binding theory (BT) developed by Chomsky in a series of works from 1973 on. (1) gives the formulation in Chomsky (1981).

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

The definition of 'governing category' is given in (2).

(2) **b** is a **governing category for a** if and only if **b** is the minimal category containing **a**, a governor of **a**, and a SUBJECT (accessible to **a**).[1]

As it has been argued that condition C is not part of the grammar (Chomsky (1982), Reinhart (1983a, 1986)), and none of the contributions in this book discusses it, we will further ignore it.

It has been noted for quite some time that for anaphors in many languages condition A does not hold as stated. This is in particular true for long-distance anaphors. There are some well-known discussions in the literature of non-clause-bounded reflexives (NCBR) in Icelandic (Thráinsson (1976a, b), Maling (1982) and others), and the Italian anaphor *proprio* (Giorgi (1984)). This led to a number of proposals to modify the binding theory, for instance Koster (1985, 1987), Manzini & Wexler (1987), and Wexler & Manzini (1987). These theories express two claims: (1) languages may differ in the binding domains of their anaphors; (2) within one language different anaphors may have different binding domains.

The common assumption in these studies is that all anaphors share the same type of binding relation. The differences are captured by parametrizing the opacity factor defining the governing category, as in (3).

(3) **b** is a **governing category for a** if and only if **b** is the minimal category containing **a**, a governor of **a**, and F (F an opacity factor).

The generally accepted definition of binding is given in (4).

(4) **a** binds **b** iff **a** and **b** are coindexed and **a** c-commands **b**.

F may assume values such as (**accessible**) **SUBJECT**, **Tense**, **Agr**, or **Comp**. These opacity factors are taken from a universal set, with particular anaphors differing in the value selected. This choice is represented in the lexical entry. Similarly, languages may differ in the opacity factors they make available. Anaphors with an opacity factor beyond the SUBJECT are classified as long-distance anaphors.

So far, however, opacity factors have been represented as arbitrary features; hence, no principled restrictions on the set of opacity factors have been developed. In the absence of such restrictions the theory predicts virtually unlimited possibilities for anaphors to differ. In the survey of the languages discussed in the volume which is presented in section 3, we will see to what extent this prediction is borne out.

Condition B raises a question of a different kind, namely, why it is so constant across languages. The original formulation in Chomsky (1981) left some empirical gaps. But Huang's (1982) modification that the opacity factor for pronominals is **SUBJECT**, rather than **accessible SUBJECT**, comes close to being descriptively correct. It is presently quite unclear why the opacity factor for pronominals does not vary, and why the complementarity between pronominals and anaphors, which

is generally quite striking, breaks down in some constructions, especially in languages with long-distance anaphors. Since complementarity facts will bear on the assessment of the anaphoric system in a language, they are included in the survey below.

3 The contributions and their implications

Many of the contributions contain features that cannot be easily accommodated in a binding theory modelled on (1–4). However, they are often quite compatible with each other.

3.1 Argument structure and binding

One of the important issues in current theory is the relation between argument structure and binding. This issue is addressed in a number of contributions.

In chapter 2 Hellan discusses the anaphoric systems of a number of languages, focussing on Norwegian and Icelandic, but also including Italian, Dutch, Japanese and Chinese. He proposes that there are two types of conditions on anaphoric relations: containment conditions and connectedness conditions.

Containment conditions are in effect conditions on the binding relation. They can be viewed as generalizations of the c-command requirement in (4). They express that the antecedent **a** must bear a certain prominence relation to the maximal constituent which contains the anaphor **b** but does not contain **a** (**max**(**b**)). In the case of c-command this relation is purely structural (sister of). The cases discussed by Hellan involve narrower requirements, for instance, that **max**(**b**) must be **predicated of a**, that **max**(**b**) is an argument of the same verb **a** is an argument of, or the (negative) requirement that **max**(**b**) does not contain a Tensed S containing **b**, etc.

Connectedness conditions affect a different part of the binding theory. Hellan argues that for local binding relations binder and bindee must be **connected** by being co-arguments of a lexical head. This makes the structural notion of a governing category irrelevant for local binding.

This modification ties in with other proposals. Everaert establishes that there is a direct connection between θ-theory and the selection of anaphors. Kiss shows that anaphor binding must be sensitive to the hierarchy of thematic roles. In a different way, also Giorgi shows that the θ-assigning properties of the head governing the anaphor are crucial. A synthesis of these findings is attempted by Reinhart and Reuland, who propose that local binding involves the manipulation of the thematic grid of the predicate of which binder and bindee are arguments.

Hellan also discusses discourse-dependent anaphora, involving the condition

that **max**(**b**) must be **in the perspective of a**. **b** is in the perspective of **a** if **a** is the person from whose point of view the report containing **b** is made. This instantiates the more general phenomenon of **logophoricity**: the element binding **b** must bear one of a number of specific roles in the discourse structure (see Sells (1987) for an analysis of the notion of logophoricity, and Reinhart & Reuland for further discussion in the present book). Logophoric binding does not require that the antecedent is structurally represented in the sentence, so the anaphoric element is allowed to be free (as discussed by Thráinsson).[2] It seems that logophoric binding relations fall outside the domain of the structural binding theory, but their existence is important for determining the number of binding domains that have to be distinguished and the nature of their difference.

Standard binding theory just takes it for granted that there is a distinction between anaphors and non-anaphors. But Thráinsson, in chapter 3, provides a detailed analysis of the referential properties of NPs introducing much finer distinctions, which standard binding theory is unable to deal with. He provides a typology of reflexives based on comparison of their behaviour in the group of Scandinavian languages. This leads to a theory in which the anaphoric character of an NP can be accounted for in terms of specific lexical properties.

Like Hellan, Thráinsson shows that structural requirements represent necessary, but not always sufficient, conditions on anaphoric binding. By careful consideration of the data he leaves no doubt that in certain cases of LD-reflexives the binding requirements cannot be stated in purely structural terms, and that some need not even be syntactically bound at all. The characteristic of such reflexives is that they are incapable of independent reference for purely lexical reasons. Instances of reflexives that are bound from outside a finite clause, and those that are not syntactically bound at all, form a natural class. This leads to a typology in which the feature [+/− independent reference] is a separate parameter.

In the binding theory of (1–4), the complementarity between pronominals and anaphors is accounted for in a largely stipulative manner. One of Everaert's major insights is that complementarity phenomena are essential for our understanding of how binding works. In his contribution in chapter 4 he discusses facts from a wide range of languages while focussing on a comparison of Dutch and Frisian. He notes that a coherent notion of long-distance anaphora has not been established so far, and starts from the null hypothesis, namely that one binding theory suffices for non-logophoric anaphors. The distinction between local and non-local anaphors is represented in the requirement that certain anaphors must be free in their minimum governing category, and in the conditions on complementarity between anaphors and pronominals. Of special importance is the fact that the non-local anaphor *zich* in Dutch may be locally bound in the same environments in which

the pronominal *'m* may be locally bound in Frisian. His finding that the relevant conditions are stated in terms of θ-government constitutes a major step forward. It provides a crucial link between binding theory and argument structure. These results are quite compatible with much of Hellan's approach, and can be viewed as filling in the connectedness module. Although Everaert's contribution itself still uses the notion of a governing category, it effectively contains the considerations needed to abolish it as an independent theoretical concept. His contribution contains an illuminating discussion of reciprocals.

The relation between binding and argument structure is also the topic of Kiss's contribution in chapter 12. Kiss discusses anaphora and variable binding in Hungarian, comparing these with their counterparts in English. Kiss argues that due to the flat structure of Hungarian all arguments in a clause c-command each other. Yet, there are binding asymmetries mirroring those of English. Kiss concludes that in general the binding hierarchy is only in part a reflection of formal properties of the structure, such as c-command and precedence. Relative prominence of roles in the thematic lexical argument structure must be another important factor. She argues that this factor is operative not only in Hungarian, but also more generally. The asymmetries among PP complements in English (*with* NP versus *about* NP) cannot be explained in terms of differences in c-command, but must be stated in terms of such a hierarchy.

Giorgi's contribution in chapter 9 analyses anaphora in PPs, focussing on the long-distance anaphor *proprio* and the local anaphors *sè* and *se stesso*.[3] *Proprio* can be clause bound, or LD-bound. In the latter case it is subject oriented. *Sè* is always subject oriented. It cannot be governed by a verb, but must be governed by a preposition; *se stesso* is clause bound, but without further restrictions. *Proprio* is like *sè* when LD-bound, but like *se stesso* when clause bound. When subject bound these anaphors are not in complementary distribution with pronominals. The properties of *sè* are reminiscent of Dutch *zich*. This suggests a connection with the theory of *zich* developed by Everaert (see Reinhart & Reuland for further discussion).

Discussing anaphora in structures of the form [NP XP], Giorgi makes the following important observation. If the XP contains a subject-oriented anaphor and it is an AP, the NP is a possible antecedent, but if the XP is a PP it is not. On the basis of an extensive discussion of θ-marking properties of APs and PPs, she argues that the effect is due to a difference in the following respect: APs may assign an external θ-role, PPs cannot. Hence, when construed with a PP, the NP cannot count as prominent in the relevant sense. The relation between the NP and the PP cannot be the formal predication relation. Interpreted along these lines her contribution provides further support for the θ-related nature of anaphora. There is also

another possible interpretation: APs exhibit agreement, and PPs do not. If subject-oriented anaphors required an Agr, the same pattern would follow. Establishing which is the correct factor will be important for a proper understanding of the Italian system of anaphors.

3.2 Binding and movement

Standard binding theory has little to say on the nature of the opacity factors. It essentially stipulates that certain categories are opaque for binding. In recent years, movement theory has become increasingly articulated. Building on earlier proposals (Lebeaux (1983), Chomsky (1986a)), Manzini, Pica, and Huang & Tang set out to derive a number of properties of binding from the theory of movement discussed in Chomsky (1986b). These proposals deal with the mechanics of binding, i.e. the question of how coindexing is brought about. The discussion in Hellan, Thráinsson, Everaert, Kiss, and Giorgi involves higher-level issues. It is an important question to what extent the various higher and lower-level analyses are compatible.

Faltz (1977) and Pica (1985, 1987) have observed that there are systematic differences between simplex (mono-morphemic) and complex anaphors. Anaphors of the former type may be non-local, those of the latter type are always local. In his earlier work Pica attempted to give a full explanation of binding in terms of movement. In his present contribution (chapter 5), Pica argues that a full reduction cannot be achieved, but that the differences between local and non-local binding follow from the way in which the theory of movement proposed in Chomsky (1986b) interacts with the binding theory proper. Cross-linguistic variation between reflexives can be reduced to differences in their lexical properties. No reference to parameters is necessary. Central is the idea that reflexives are subject to cyclic movement from Infl to Infl through Comp. Mono-morphemic anaphors like *sig* are full-argument NPs; hence the term 'argument anaphors'. If at LF they move up to a position governed by their prospective antecedent, intermediate traces may delete. So, this movement will not be generally clause bounded. In the case of complex anaphors like *himself* (adjunct reflexives in his terms), the specifier *him* moves up. *Him* is an adjunct, hence intermediate traces may not delete. Therefore, movement will be clause bounded. Similar considerations apply to clitic reflexives, which are not arguments either. θ-theory and argument structure are only indirectly involved. It is not clear how Pica's approach is to be reconciled with the facts and insights put forward by Hellan, Everaert, and Kiss.

In chapter 10 Manzini investigates the hypothesis that the binding conditions reflect conditions on movement, and that all locality conditions can be unified under the notion government. In particular she investigates whether the natural

minimal binding category for an anaphor is the first maximal projection containing it (see also Koster (1987)). She argues that binding of anaphors in verb complement position can be brought under that conception, but for binding of anaphors contained in NPs presence or absence of a subject is relevant. Also, the fact that anaphors may differ as to their binding domain shows that opacity factors must enter into domain specifications to express the parametrization (see (4)). Her analysis is based on a detailed discussion of inalienable possession and reciprocals in Italian. She shows that when *l'uno l'altro* 'each other' is part of an NP, the opacity conditions on *l'altro* are subject based, those on *l'uno* barrier based. She then argues that *l'altro* is an A-anaphor, while *l'uno* is an A-bar anaphor.

Pica and Manzini converge in the conclusion that a full reduction of binding theory to principles of movement has not been achieved. As in the case of Pica, it is still to be determined to what extent Manzini's approach ties in with the results obtained by Hellan, Everaert, and Kiss. This is especially relevant, since these authors have nothing to say about A′-anaphors. However, if it is in general true that A′-anaphors are sensitive to barriers and A-anaphors to other conditions, this raises the question to what extent the theory of the two should be unified.

As we noted earlier, most theories have nothing specific to say on the question of what makes an anaphor into an anaphor. To our knowledge, Bouchard (1984) has been the first to claim that NPs must have φ-features (features of person, number or gender) in order to be able to refer. A theory along these lines is developed by Huang & Tang (chapter 13) in their analysis of Chinese anaphors: *ziji* is an anaphor because it lacks φ-features (and hence a referential index), *taziji* is an anaphor only because it lacks a referential index. *Taziji* is a local anaphor, *ziji* is non-local. *Taziji* is just like *himself*. This is just what one would expect under Pica's approach. *Ziji* has an unusual property, however. It allows a non-local antecedent, namely any c-commanding subject. This is subject to the condition that all intervening potential binders agree with the target binder in person and number features. The explanation uses the idea that the licensing of an anaphor involves two steps. In order to be able to bear a referential index an NP needs φ-features. So, an ordinary NP like *John* has both. Compound anaphors do have φ-features (because of the pronominal they contain), but lack a referential index. The bare reflexive lacks both. The binding theory applies at S-structure and at LF. An anaphor with φ-features will receive its referential index at S-structure. This index cannot be changed at LF. Hence even if it were to move at LF, this would not increase the class of possible antecedents. The bare anaphor *ziji*, lacking φ-features at S-structure, must first pick up these from a c-commanding subject. Without them it does not qualify as an argument, hence the binding conditions do not apply. Thus, Huang & Tang argue, it cannot acquire its referential index before

LF. So, LF-movement into the domain of a higher antecedent does not cause a change of referential index. Hence it is allowed. Just like the referential index, φ-features once assigned may not be changed. LF-movement into the domain of a higher subject will proceed through the domains of the subjects of intervening clauses. If any of those bears a different set of φ-features this would cause the features of *ziji* to change, in violation of the requirement that once assigned they may not change. Hence, intervening subjects must all agree in φ-features.

Both Huang & Tang and Pica assume, with Manzini, that an anaphor must be governed by its antecedent. If at S-structure it is not, it must move up at LF. They assume different mechanisms, though.

Huang & Tang subsume non-local anaphora under QR (adjunction to IP). Pica assumes that anaphors are clitics and hence undergo clitic movement (adjunction to I). The most striking difference involves the explanation of the locality of complex anaphors. According to Huang & Tang it is because the anaphor contains an element with φ-features, according to Pica because it contains an adjunct, which is sensitive to barriers.

Like Pica's, Huang & Tang's proposal does not easily accommodate the θ-theoretic insights of Hellan, Everaert, and Kiss. Both are intriguing proposals, which require detailed further investigation.

3.3 Properties of anaphoric domains

In order to determine the nature of anaphoric domains it is helpful to further investigate a number of languages.

The anaphoric system of Polish, discussed by Reinders-Machowska in chapter 6, comes out as rather prototypical. The author discusses the argumental anaphor *siebie* and the possessive/adjectival anaphor *swój*. Despite appearances, there are two relevant binding domains, as in Finnish. The smallest maximal projection containing both the anaphor and a subject is the local domain; the smallest maximal projection containing the anaphor and Tense is the extended domain. In addition to local binding there is binding across a subject. The separate character of the local domain is obscured by the fact that there is no overt distinction between local and non-local anaphors. Yet, a local domain must be distinguished, as the reciprocal interpretation of *siebie* and *swój* (available in addition to the standard reflexive interpretation) is only possible within the local domain. Furthermore, anaphors and pronominals are in complementary distribution in the local domain, but not when binding obtains across a subject. As a matter of terminological convenience, we will henceforth refer to binding across subjects as medium-distance binding.

In chapter 7, Toman discusses reflexivization in Czech. There is a strong reflexive *sebe*, a clitic reflexive *se*, and a possessive reflexive *svůj*. In Czech these anaphors

constitute a quite homogeneous group. For all of them the binding domain is the smallest maximal projection containing an accessible subject. So, they qualify as local under the present perspective. They induce the same requirements on possible antecedents. Toman shows that Czech anaphors are all subject oriented. Apparent object antecedents must be construed as subjects of small clauses, along the lines of Kayne's (1981) small-clause approach to argument structure. Unlike in Polish, infinitival clauses are opaque. Small clauses are not, however. Toman reconciles this with the role of the subject in defining the binding domain by proposing that subjecthood is optional when it is not forced by other factors. This is independently necessary for binding within NP. Subjects of NPs are possible antecedents, but do not cause opacity. The reason is that in Czech such subjects are adjectival. Either argumenthood or adjectivality may prevail.

The behaviour of the clitic anaphor *se* seems more complicated. However, Toman convincingly shows that its special behaviour follows from general properties of clitics (e.g. that they must be licensed by Comp or Infl) interacting with a binding requirement which is identical to that of *sebe*. It should be noted that the Czech reflexives are subject oriented, although they only allow local binding. This is a matter for further investigation.

Investigating an extinct language poses a special challenge. In chapter 8 Benedicto presents an attempt to investigate the anaphora system of Latin. Although an unequivocal interpretation of the data cannot always be guaranteed, Benedicto makes clear that *se* can at least be bound across subjects, i.e. it is a medium-distance anaphor. Even in non-local contexts *se* can be bound by direct objects, though. This would seem to go against the general pattern that medium- or long-distance anaphors can only be bound by subjects. It becomes less surprising, however, if one takes into account that *se* can even be bound by various topicalized material. This suggests that in some of its uses *se* falls under conditions on logophoricity rather than binding conditions in a strict sense.

The properties of the anaphoric system in Finnish are discussed by Van Steenbergen in chapter 11. There is a reciprocal, *toiset*, two lexical reflexives, *itse* and *hän itse*, and an empty reflexive possessive, *e*. Finnish has two binding domains: the smallest maximal projection containing the anaphor and a subject and the smallest maximal projection containing the anaphor and Tense. The former has the properties of a local domain, the latter is a medium-distance domain. As usual, the reciprocal must be bound in the local domain. Similarly, anaphors and pronominals are in complementary distribution only under local binding. *Itse*, *hän itse* and *e* can all be bound outside the local domain; the antecedent must be a subject. *Itse* and *e* can also be bound within the local domain, but only by the subject. Also *hän itse* can be bound within the local domain, but in that case only by a non-subject.

Van Steenbergen proposes a general distinction between two modes of binding: local binding, which involves the direct association of an anaphor with its antecedent, and long-distance binding (medium-distance binding in our terms, since no logophoricity effects can be observed), which involves the formation of a chain of elements linking the local domain to the domain of the antecedent. This chain requires a dependence between the Infl-nodes heading the Ss crossed. The fact that intermediate Infls are crucially involved in this link explains the privileged status of the subject as an antecedent (as only the subject is governed by Infl), and also the fact that the local subject cannot bind an anaphor in an adverbial clause (the Infl governing the local subject does not c-command the Infl of the adverbial clause). These results can be directly related to the approach in Reinhart & Reuland; binding in the local domain involves argument binding via the θ-grid; medium-distance binding is sensitive to Tense/Agr domains.

By way of conclusion, in chapter 14 Reinhart & Reuland sketch an alternative conception of the binding theory. This proposal is based on a number of results obtained in the various preceding chapters. Its main claims are the following. The complementarity between pronominals and anaphors in the local domain follows from a general condition on θ-grids, applied to predicates expressing a reflexive relation. The local character of complex anaphors follows from the conditions on the interpretation of 'self'. The subject orientation of medium-distance anaphors follows from the fact that they must obtain φ-features from Agr. It is shown that English anaphors in positions outside the scope of the theory are in fact logophors, and do not represent bound variables. Given this approach one would expect that the same holds true for anaphors outside the core binding position in other languages as well. Specifically, anaphors in adjunct clauses in Chinese, discussed by Huang & Tang, should be investigated. This issue represents one of the many challenges left for future research.

4 Surveying anaphoric domains

4.1 Background

The properties of long-distance anaphors (LD-anaphors/LDAs) as discussed in the current literature can be summarized as in (5), with (5A) as the initial defining characteristic.

(5) A. LD-anaphors allow an antecedent outside the governing category as defined in (2).
B. The antecedents of LD-anaphors are subject to a more restrictive promi-