Perspectives on Binding and Atomism

Hans Bennis, Pierre Pica, Johan Rooryck

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Hans Bennis, Pierre Pica & Johan Rooryck (eds)

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Preface: Perspectives on Binding and Atomism

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1   Introduction : 'internal' vs 'external' reference

A general assumption within generative theory is that the concept of *binding* is identifiable with a set of mechanisms and principles, specifically dealing with the distribution *and* interpretation of *definite descriptions, pronouns* and *reflexives*.[1] The aim of this introduction is to situate the articles contained in this volume, and to offer a perspective on the theoretical development of the various issues that are considered to be relevant to the study of binding. Hopefully, this will provide the reader with a background useful for understanding both the content and the scope of this volume.

Current issues in the theory of binding cannot be understood without keeping in mind the general goal of the generative enterprise. Although specific models differ in various ways, the leading ideas with respect to the main properties of the language faculty are remarkably constant since the pioneering work in the early fifties. In this early work (Chomsky 1951, 1955, 1975), a linguistic theory is explicitly defined as a model that consists of various levels of representation; a new abstract device was introduced in order to account for the complexity of language in an explanatory way. The concept of grammatical transformation was motivated as an attempt to solve the tension between descriptive and explanatory adequacy.

The approach of this early work gave rise to the factorization of linguistic objects in terms of subsystems of the linguistic model. Subsequent revisions of this type paved the way to an *atomic* theory of language. The general procedure by which a model is built out of various relatively independent submodules is referred to by the term

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[1]   In as far as empty positions can be reduced to one of the former categories, binding is also relevant to the theory of empty categories.

Atomism. This approach has led to a number of abstract entities, such as Deep Structure and Surface Structure, and to abstract subtheories applying to these levels of representation, such as Government, Subjacency, and X'-theory. In current thinking these abstract levels and submodules are suspected to be artefacts which can be derived from even more general abstract principles, some of which are related to formal conditions in terms of elegance, simplicity or economy (Chomsky 1995a). The search for such conditions, which might be considered equivalent to 'evaluation procedures', remained constant throughout the historical development of generative theory.

The language faculty is supposed to be an autonomous cognitive system. This view does not imply that it represents all the knowledge a language user needs to use his language. The language faculty interacts with other cognitive faculties. It is 'encapsulated' in the sense of Fodor (1983). In particular, the theory has to be embedded in a broader semiotic theory which makes use of the grammatical information to determine the 'meaning' and the 'reference' of expressions, and to guarantee an appropriate use of a particular linguistic object. As a result, there is no way to directly associate a syntactic object with a real world object. This is in opposition to what is generally argued in 'possible world semantics' and in most work on the philosophy of language.[2]

This state of affairs implies that we have to distinguish between those aspects of reference and/or meaning that are internal to the language faculty – 'internal reference' –, and aspects of reference/meaning that belong to other faculties of the mind/brain, or relate to the real world – 'external reference'. Aspects of 'external reference' may belong to pragmatics or discourse. Using slightly different terms, we have to make a distinction between grammar-dependent aspects of reference and object-dependent aspects – to use a terminology introduced by Vergnaud & Zubizaretta (1992) that can be traced back to Russell (1905). This factorization of reference has raised a lot of debate in linguistics, philosophy and cognitive science,[3] as is also attested by various articles in this volume. This factorization can be viewed as an application of *Atomism* in the domain of Binding.

An example may clarify this issue. Take a simple sentence such as (1).

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[2]   Which is not to say that some phenomena alluded to within the philosophy of language cannot be restated in internalist terms, as several of the articles in this book suggest.

[3]   See the various articles in Rosenberg & Travis (1971). For, more recent discussions, see Chomsky's reactions to Quine (1960, 1972), Kripke (1982), and Searle (1992) in Chomsky (1976b, 1986a, 1995b, 1996).

(1)   John took a book from the shelf and read it.

In this sentence the noun *book* is related to a lexical entry that contains information about properties of this noun such that the noun phrase *a book* can be understood as a mental object or a physical object in the real world. In this case we may assume that the second conjunct of (1) underlyingly contains a second occurrence of *a book* in object position. A transformational rule can be formulated that replaces the second occurrence of *a book* by *it* under referential identity with the object in the first conjunct. However, an approach like this is bound to fail given the existence of examples like (2), from Bach (1970), quoted in Jackendoff (1972).

(2)   The man who deserves it will get the prize he wants.

Examples like these clearly show that one cannot simply claim that a pronoun such as *it* is inserted by a transformation that replaces the constituent that it is coreferential with (*the prize he wants*), since it would lead to infinite recursion due to the fact that this latter constituent contains a pronoun (*he*) itself, as is shown in (3).

(3)   The man who deserves [the prize [the man who deserves [the prize [the
          man who deserves [the prize [the man .....

We thus need to distinguish between those aspects of reference that are grammar dependent, and those aspects that relate linguistic objects to non-linguistic entities either within the cognitive system, or in the 'real world'. This volume contains articles on both these perspectives.

Consequently, there are at least two ways to read this book. Some scholars will be interested in specific issues concerning binding proper and the relation of binding with other atoms of the grammar. Others may want to reach a better understanding of binding in the light of broader issues concerning the relation between grammar and the cognitive system, or between grammar and the outside world.

2   Nonintersecting reference and (non-)coreference

Since the mid-1960's, the emphasis of linguistic theorizing in generative grammar gradually shifted from structural descriptions and specific rules towards the formulation of general conditions constraining the mechanisms of the Grammar (Chomsky 1964, Ross 1967a). Binding did not escape this general tendency, as attested by the important work of Jackendoff (1972) who claimed that neither pronominalization nor reflexivization could be accounted for in terms of construction specific transformations.[4]

The investigation of what would later be called anaphoric relations has played an essential role in the process of reducing apparently unrelated constraints to more general conditions applying to various areas of the grammar. More in particular, the predominant view was that syntactic relations such as *each*-movement (cf. Dougherty 1969), NP-movement, *Wh*-movement, and interpretive phenomena including anaphoric relations of pronouns, were subject to the same locality conditions (Chomsky 1973).

All dependencies were to be treated by the interactions of two main conditions, the Specified Subject Condition (SSC) and the Tensed-S Condition (TSC). These general conditions were moreover constrained by a more general principle, the 'A-over-A' Principle.[5] The TSC and the SSC also applied to a rule of interpretation (RI), reminiscent of Postal's 'Unlike Person Constraint' (Postal 1966, 1969). RI is a principle which seeks to interpret two NPs in a structure NP V NP as nonintersecting in reference. RI thus explains the deviance, (marked as '*' by Chomsky 1973) of the sentences in (4). RI also ensures that *he* and *him* in (5) are interpreted as different, and that *the officers* are not understood as being part of *the soldiers* who do the shooting in (6) (examples are from Chomsky 1973:241(42-44)).

(4)   a   * I watched us leaving (in the mirror).

         b   * I saw me.

(5)   He saw him.

(6)   The soldiers shot the officers (among them).

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4   As opposed to the earlier accounts of Lees & Klima (1963), Ross (1967b) and Langacker (1969).

5   Interestingly, the A-over-A principle already contained the germ of the syntactic notions of 'cyclic node', 'subjacency' and 'containment', which all play a crucial role in further developments (see in particular Chomsky 1986b).

Chomsky (1973:241,fn.20) acknowledges in a footnote that this approach to nonintersecting reference among pronouns and noun phrases presupposes Helke's (1970) analysis of reflexives and inherent anaphora. Assuming Helke's analysis within this framework, it is the idiomatic nature of the possessive in (7a) which prevents RI from applying to it. Helke extends this analysis to (7b) by assuming that *himself* is analyzed as [*his self*].

(7)   a   John lost his mind.

        b   John saw himself.

Chomsky (1976b:104, fn.35) explicitly analyzes *his* in (7a) as an anaphor, on a par with the reflexive in (7b), as opposed to *John lost his book* where *his* is a nonidiomatic pronoun.[6] Fodor (1975:141-142) also argues in favor of the decomposition of *himself,* on the basis of a comparison of *himself* with what would later be called PRO (see also Castañeda 1966 for related ideas).

It can be observed that RI only has an indirect relation to the notion of coreference. It is a principle that ensures the nonintersecting interpretation of both pronouns and noun phrases, of which noncoreference is just a subcase. Importantly, Chomsky (1973) did not have a device ensuring direct coreference, as already pointed out by Lasnik (1976). In other words, while present-day Binding theory is constituted of distinct conditions on the coreference of reflexives (Condition A) and pronouns (Condition B), generative grammar of the early seventies only had a principle that looked like a predecessor of Condition B, to the extent that RI was subject to TSC and SSC. Significantly, there was no such predecessor for Condition A, with the possible exception of *each*-movement. Surprisingly then, the earliest stage of Binding theory was exclusively concerned with a rule of nonintersecting reference.

Moreover, since RI is subject to the locality restriction of TSC and SSC, it has nothing to say about a sentence such as (8b), which in present-day Binding theory is excluded by Condition C.

(8)   a   John said that he would win.   (John = he)

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[6]   This morphological decomposition entails that bimorphemic anaphors can be considered an idiomatic type of pronoun, a position close to that of Kayne (1992). Interestingly, the issue of morphological complexity of anaphors was developed more thoroughly by Pica (1982, 1984a, 1985) and much subsequent work, e.g. Cole & Sung (1994), Postma (this volume), and various articles in Koster & Reuland (1991). See section 3.4.

    b   *He said that John would win.   (he =John)

Sentences (8a) and (8b) were indeed analyzed by Chomsky (1973:238,fn.16) as the result of a rule of Coreference Assignment, distinct from RI. Chomsky (1973, 1976a:324) claims that this type of rule does not belong to sentence grammar, but belongs to discourse (see also Lasnik 1976, and references therein).

    A different view was developed in the late seventies inspired by influential work of Reinhart 1976, 1983a), which was adapted in part by Chomsky (1981). Reinhart observed that the grammar needs to deal with sentence (9), where, in contrast to (8), the pronoun is interpreted as a bound variable.

(9)   Every man said that he would win.

           'For every x, x a man x said that x would win.'

    Reinhart suggests that binding relations should be restricted to variable binding (see Reinhart (1976, 1983ab), and that binding relations should be established by sentence grammar in (9), and not in (8).

    Every man in (9) has to c-command the pronoun in order to be interpreted as a bound variable. According to Reinhart, this is a stronger condition than the one which restricts pragmatic coreference, which requires only that the pronoun does not c-command the antecedent. Reinhart notes further that although sloppy identity involves a bound variable interpretation of the pronominal element, it is not restricted to a quantified antecedent, as illustrated by (10).

(10)   Charlie Brown talks to his dog and my neighbor Max does too.

            (with the interpretation : 'Max talks to Max's dog.')

Following Keenan's (1971) and Partee's (1978) analysis of NPs, and Sag's (1976) and Williams' (1977) analysis of ellipsis, Reinhart argues that definite NPs can be introduced by a lambda operator and that a bound pronoun is interpreted as a bound variable, i.e. it is a pronominal whose coreference is grammatically determined, and in this sense comparable to a reflexive.

    Reinhart's influential ideas are represented in various articles in this volume. This view distinguishes bound anaphora (belonging to the domain of sentence grammar) from pragmatic or intended reference. It amounts to saying that (8b) is not ruled out by principles of sentence grammar. This view gave rise to two important debates. First of

all, a discussion arose on the nature of the rule accounting for (8a), when the pronoun is not interpreted as a bound variable. Secondly, a debate developed on the nature of the rule that accounts for the ungrammaticality of (8b).[7,8] This line of research led to further insights in what came to be called 'referential dependencies'.

3   Issues in the theory of Binding

3.1   Binding and (co)indexing

The conceptual and empirical problems mentioned in section 2 led to various lines of research. Chomsky's view first outlined in *On Binding* (Chomsky 1980) and further refined in *LGB* (Chomsky 1981) and *KoL* (Chomsky 1986a), involves various radical conceptual shifts. The notion of anaphor is introduced and defined as including both reflexives and NP-traces. Anaphors are bound in a self-contained domain, while pronouns are free in the same domain. Referential expressions are free throughout.

(11)   Condition A: anaphors are bound in their domain.

          Condition B: pronouns are free in their domain.

          Condition C: referential expressions are free.

The domain for anaphors and pronouns is defined in terms of Government (Chomsky 1981), or Complete Functional Complex (CFC) (Chomsky 1986a). In these approaches, the distribution of anaphors (Condition A) and pronouns (Condition B) is defined in a complementary fashion. This complementarity gave rise to a number of problems that played an important role in subsequent reformulations of the theory (see e.g. Reinhart & Reuland 1991, 1993). The notions 'bound' and 'free' are defined in terms of c-command and (co-)indexing.

The specific formulation of Binding theory from *LGB* on involved a shift in attention from the notion of '(non)intersecting reference' towards the notions 'free' and 'bound' in terms of 'coindexing'. The *LGB* approach allowed for a better

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[7]   See Lasnik (1976(and references quoted therein, and Chomsky (1981:227,fn.45), where it is suggested that it might excluded by a principle of discourse.

[8]   See in particular the observations of Bolinger (1979) and Carden (1982) on backwards pronominalization, and, for a different view, Neale (1990).

understanding of the relation of binding phenomena and movement, and for the formulation of general constraints applying to both (cf. 3.2). At the same time, however, the move away from treating pronominal noncoreference in terms of 'nonintersecting reference' and towards an analysis in terms such as 'free', i.e. non-coindexed, led to an approach of binding phenomena in which the notion 'coreference' is conceived of in 'externalist' terms. In an 'externalist' approach of *coreference* and *bound*, coindexed elements are taken to share the same external reference. The notion 'coindexing' appears to be particularly susceptible to such an interpretation, since the relation between indices has no inherent semantic import (see also Lasnik 1989). Therefore, the notion 'coindexing' may have contributed to the 'externalist' view, despite Chomsky's (1981:161) early warning that it should be viewed as no more than a technical device, perhaps eliminable from the grammar. The analysis of binding phenomena in terms of '(non)intersecting reference' is less susceptible to an 'externalist' view of binding, since it requires a definition of the notion of intersection that depends on linguistic representations.[9]

The use of the notions of 'coreference' and 'reference' in Chomsky's writings has often given rise to misunderstandings among both linguists and philosophers. Chomsky has always been radically opposed to a linguistic role for the interpretation of the notion of reference in the Fregean sense, as only referring to 'things in the world'. He explicitly defends a radically 'internalist' conception of the notion of reference, where reference is determined by the perspective on things by a linguistic agent (see Chomsky 1976b, 1979, 1995b, 1996). This position is not shared by everyone in the field (see e.g. Bilgrami's comments in Chomsky 1996).

It should be stressed that the emphasis on a theory of binding couched in terms of coindexing made it possible to see the broader syntactic relations of binding phenomena *stricto sensu* with other dependencies, such as those generated by movement. At the same time however, this theory made it difficult to express the earlier 'internalist' semantic generalizations in terms of '(non-)intersecting reference'. In Chomsky's (1980) *On Binding* both the semantic and the syntactic aspects of disjoint reference were combined by a complex system of indexing, which allowed him to express the effects of *nonintersecting* reference in terms of *disjoint* reference. The later

[9] Chomsky (1995a:94) states that coindexation is a symmetric relation, as opposed to an asymmetric relation, such as Higginbotham's (1983, 1985) Linking. These terms do not receive further explanation, but they can be understood to distinguish a view on coreference in terms of identity of reference (coindexation) from a view in which coreference is analyzed in terms of (non-)intersecting reference.

simplification of the system of indexing made the discussion around 'nonintersecting' reference less prominent, as pointed out by Lasnik (1989).

Summarizing, we have seen that there is an 'internalist' and an 'externalist' view on binding phenomena. Although sometimes rather implicitly, both views on binding phenomena gave rise to different research projects within the framework of generative grammar.

In our view, Higginbotham's (1983) Linking theory constitutes an example of an 'internalist' approach to coreference. Under the influence of Evans' (1980) claim that pronouns cannot be referentially dependent on each other, Higginbotham (1980ab, 1983, 1985) developed Linking theory as an alternative to Binding theory (see also Montalbetti 1984).[10] Linking theory has no indices and uses an arrow notation to indicate linked elements. Linking of an element A to an element B requires that the reference of A include the reference of B. Contrary to the Binding theory indexing device, the arrow notation allows for an analysis of cases such as (12), where the pronoun *they* is linked to two antecedents.

(12)   Sue told Mary that they should go.

The facts accounted for by Condition A in Binding theory receive a fairly similar account in Linking theory to the extent that notions such as governing category and c-command are factored in. The uniqueness requirement between anaphors and their antecedents is captured by reducing the inclusion requirement to exactly one. This accounts for the ungrammaticality of (13a). However, as Lebeaux (1985) has shown, it also rules out (13b).

(13)   a   * John asked Mary about themselves.
         b   John asked Mary about each other.

As pointed out by Lasnik & Uriagereka (1988:133-137), Linking theory does not account well for Condition C phenomena, since the notion 'free' is unavailable in this theory. Linking Theory is however more successful in accounting for certain cases of

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[10] This theory is reminiscent of the ideas in Zribi-Hertz (1979) relating anaphoricity to notions of 'intersecting reference'.

weak crossover, as well as for the four way ambiguity of *The men told each other that they should leave*. Such cases are hard to deal with in an index-based Binding theory.[11]

In line with Higginbotham's approach, **Hoji** (this volume) argues that Principle B of the Binding theory is a condition on linking or formal dependency, rather than a condition on coindexation. His argumentation is based on a discussion of bound variable anaphora and sloppy identity in Japanese.

Tancredi (this volume) offers another 'internalist' perspective on Binding. He shows that the traditional distinction between pronouns as either bound variables or referential expressions is not sufficient to account for the constraints on the interpretation of pronouns, in view of the behavior of what he calls 'self-oriented' interpretations of pronouns. Such 'self-oriented' interpretations of pronouns cannot be captured in terms of traditional Binding conditions. Within what we would call an 'internalist' view of (co)reference, Tancredi focuses on how to generate and restrict self-orientation of pronouns in terms of the notion of 'perspective' of the person grounding the reference of the pronoun.

In contrast to these 'internalist' approaches, **Fiengo & May** (1994, this volume) can be taken to represent an example of an 'externalist' view on Binding. Sharply departing from Higginbotham (1983) and Evans (1980, 1982), they explicitly take coindexed expressions to corefer as a consequence of grammatical rule. In this context, they view syntactic identity as shape identity. From this, it follows that no external indication of the referential relation of coindexed expressions is necessary or appropriate.

3.2   Binding and locality: global vs nonunifying approaches

The modular nature of the *LGB* framework raised the question as to why the same general conditions (TSC, SSC) should apply to both movement and interpretive rules. This puzzle led several scholars to propose changes affecting the entire architecture of the grammar (see among others Van Riemsdijk & Williams 1981, and Chomsky 1995a).

The discovery of the nature of different locality principles in their relation to the various subcomponents of the grammar has been a central theme of investigation since Ross (1967a). The radical idea that there should be a general unifying concept of

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[11]   See Heim, Lasnik & May (1991) for a movement-based approach to the reciprocity case.

locality has been pursued in various ways since Koster (1978), (see among others, Bouchard 1984, Culicover & Wilkins 1987, and Koster 1987).

The view according to which all constraints apply to all types of dependencies, without the necessity of movement operations, is represented in this volume by Koster. **Koster** (this volume) claims, with some justification, that his approach is reminiscent of that developed in the GB framework, where both NP traces and lexical anaphors are subject to the same principle of Binding theory. He correctly points out that this unified view is absent from the more recent minimalist framework.

Aoun (1985) develops a theory which resembles Koster's (1978, 1987) to the extent that it attempts to unify the conditions on movement and binding. Aoun's approach is however crucially different from Koster's. For Koster, locality conditions apply in the same way to binding and movement, while Aoun defends the view that all dependent elements (NP-traces, Wh-traces, reflexives, pronouns etc) are anaphors, and that differences in locality conditions derive from the A or A' properties of their antecedents.

Within nonunifying approaches, the analysis of referential dependencies and the conditions applying to them were all considered to be part of an interpretive component which did not involve movement. In *LGB*, this last aspect of the theory became the main substance of Binding theory. By contrast, the conditions on A'-movement are viewed as the core of a more syntactic component (with principles mainly dealing with traces), which gave rise to the development of Bounding theory, ECP, and antecedent-government.

This division of labor introduced a tension in the theory which would have far-reaching ramifications for the position of binding within the overall architecture of the grammar. In nonunifying approaches, the status of Binding theory as a separate module allowed in principle for its application at different levels of representation (DS, SS, LF) (see among others, Chomsky 1981, 1982; Van Riemsdijk & Williams 1981; Belletti & Rizzi 1988, Lasnik 1989).

In the context of the Minimalist Program (Chomsky 1995), however, grammar internal levels of representation no longer exist: the only relevant levels are those that constitute the articulatory-perceptual (PF) and conceptual-intentional (LF) systems. In this volume, the articles by **Lasnik** and **Freidin** explore the consequences of this reductionist approach for various empirical problems involving Binding phenomena which used to be tied to specific levels of representation.

3.3   Binding and argument structure

The fact that Chomsky (1986a) formulated locality conditions on anaphors and pronouns in terms of the notion Complete Functional Complex (CFC) related the important notion of binding domain to the domain of thematic argument structure. Various linguists were thus led to explore the possibility of viewing binding as a syntactic operation whose local nature derives from the fact that it only applies between the arguments selected by a predicate. This view was further developed by Williams (1988, 1993) and Reinhart & Reuland (1993).

Following Williams (1993), **Higginbotham** (this volume) argues that Binding theory can be extended to implicit anaphora in cases such as *a self-starting motor.* This requires that Binding applies between argument positions in a thematic grid.

In **Gruber**'s contribution to this volume, thematic relations are configurationally determined. In this view, binding is the result of the colinking of argument positions which is established via movement out of two conjoined thematic structures.

Minkoff (this volume) argues that control of PRO subjects should be divided into local and logophoric control. While local control is argued to be restricted by Binding principle A, logophoric control is contrained by a thematic principle.

A recent influential theory viewing Condition A effects as the result of an operation on predicate argument structure has been proposed by Reinhart & Reuland (1991, 1993). In this theory, reflexivization is viewed as a mechanism identifying two arguments of a predicate through coindexation. Reflexives that do not occur in an argument position are considered logophors, a term first introduced by Hagège (1974) and subsequently used by Clements (1975). Logophors are anaphoric elements whose interpretation is established through discourse functions.

This theory captures the distinction between monomorphemic and bimorphemic anaphors by stating that only bimorphemic anaphors can syntactically reflexivize a predicate. Monomorphemic anaphors, in the sense of Faltz (1977) and Pica (1984b), do not take part in the syntactic process of reflexivization. Such anaphors do not obey Binding conditions and are part of lexically (or inherently) reflexive predicates. This theory yields a residue: nothing excludes a sentence such as the ungrammatical *$John_i$ washes him_i* with a reflexive interpretation. This sentence is excluded by a Chain condition stating that the tail of a chain must necessarily be referentially deficient.

Reinhart & Reuland's (1991, 1993) theory can be viewed as an attempt to break away from the symmetry between Conditions A and B in two ways: they try to show

that the dichotomy between pronouns and anaphors cannot be maintained, and argue that Conditions A and B do not apply to the same types of predicates.

This theory does not allow for an overall analysis of Condition A effects in terms of movement of (part of) the anaphor (Pica 1987, Chomsky 1995a). It also requires a syntactic framework with two levels of representation, syntactic and semantic. Importantly, the mechanism of reflexivisation is construction specific.

Safir (this volume) agrees with Reinhart & Reuland (1991) that Binding theory requires both syntactic and semantic principles, but he develops a different implementation of this idea. Reinhart & Reuland (1991) argue that Principle A is uniquely syntactic, while Principle B is semantic in nature and applies to predicate-argument structures. On the basis of a wealth of data from Scandinavian languages, Safir claims that Binding theory is symmetric to the extent that syntactic and semantic constraints apply to both Principle A and Principle B.

3.4 Binding and decomposition

To our knowledge, Pica (1987, 1991) was the first to develop the idea that the differences between various types of Binding found across languages, i.e. long distance and local Binding, derive from the internal structure of reflexives and from the element within the reflexive that moves.[12]

Postma (this volume) further explores the idea of the morphological decomposition of anaphors. He develops the idea that syntactic possession crosslinguistically encoded in anaphors (*myself* = *my self*) should be considered a syntactic way to circumvent Principle B. Postma further argues that the semantic effect of the possessive construction is neutralized through two types of 'approximation' strategies. The first strategy involves universal quantification over parts of the antecedent, and is syntactically represented in morphologically complex anaphors. The second strategy of 'approximation' involves morphologically simplex anaphors and proceeds via upward entailment: from a predication over a part of the antecedent to a predication over the entire antecedent.

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12 See Pica (1984a, 1985); Burzio (1991ab); Safir (1996); Yang (1983), and Roberts (1997) for an overview.

3.5   Binding and discourse

A number of articles in the volume address the complex relation between binding and discourse. This issue is related to the more general distinction between sentence grammar on the one hand and discourse grammar and pragmatics on the other (Reinhart 1983).

Reuland & Sigurjónsdóttir (this volume) argue that the interpretation of the Icelandic long-distance anaphor *sig* in subjunctives is constrained by discourse factors, i.e. it receives a logophoric interpretation. The interpretation of *sig* in infinitives, by contrast, involves a structural relation with the antecedent. The authors claim that there is no intrinsic necessity for anaphors to be syntactically linked to their antecedent, but that economy requires that where they can be linked syntactically, they must be.

Berman & Hestvik (this volume) develop an analysis of plural pronouns and so-called split antecedents within a framework handling anaphoric relations at a level beyond the sentential domain. This analysis is situated within the semantic perspective of Discourse Representation Theory (DRT). They argue against the notion of 'disjoint reference', and extend their account to Principle B effects, offering a formal account of anaphora resolution at a supersentential level of representation.

Demirdache (this volume) addresses the uncertain status of Principle C as a principle of grammar or as a principle of discourse. She shows that coreference anaphora is not governed by a pragmatic rule of discourse. In St'át'imcets, coreference anaphora violate Condition C , while bound variable anaphora (BVA) respect it. The restricted domain of Condition C in St'át'imcets resembles that of focused DPs in English. Demirdache develops an account based on the difference in quantificational force of DPs in St'át'imcets and English. Demirdache assumes that DPs in St'át'imcets and focused DPs in English escape Condition C because they do not undergo quantifier raising at LF. The syntax of a given DP at LF, thus, universally, determines the anaphoric relations it can enter into.

3.6   Minimalism and Binding

The exact status of Binding theory within the Minimalist program remains somewhat unclear. While some data suggest that the syntax of Binding theory involves a movement operation of (part of) the anaphor, Binding theory as such is nevertheless defined as an interface phenomenon.

The computational aspect of Binding in terms of the interaction between morphological composition and movement can be rather clearly circumscribed. The consequences of the claim that Binding applies at the LF interface are perhaps more difficult to evaluate. Chomsky (1995a:211) rephrases Binding conditions as interpretive conditions at the interface, uniting disjoint and distinct reference. In this version, Condition A is stated in terms of coreference, while conditions B and C are phrased in terms of disjointness of reference. Chomsky notes that if the effects of Condition A are statable in terms of movement, all indexing could be dispensed with.

The result of these changes is twofold. First, the indexing device for indicating coreference is again called into question. Secondly, the rigid symmetry between Conditions A and B of Binding theory is abandoned, since they are no longer phrased in exactly the same terms: while 'bound' is the exact opposite of 'free' in *LGB* terms, it is clear that 'coreferential' is not the exact opposite of 'disjoint', in the light of the discussion in section 3.1 above.

The relation between a purely linguistic computational component and an interpretative interface component which is not entirely linguistic, but related to other cognitive abilities, thus opens new ways for understanding the relation between computation and interpretation. From this perspective, interpretability is a licensing condition on the objects formed by the computational component, although it is not a part of the linguistic system itself. But exactly how interpretability works for Binding conditions is very much an open question. Since the notion of reference cannot be interpreted in an 'externalist' way for Chomsky, the Minimalist program calls for the development of an 'internalist' view on (co-)reference as an interpretability condition at the interface.

The disappearance of levels of representation in the Minimalist program presents new challenges for Binding theory, since various proposals limiting the application of Binding Conditions to certain levels of representation cannot be expressed any longer, as discussed by **Freidin** (this volume) and **Lasnik** (this volume).

The interaction of the computational component with the interfaces PF and LF offers new ways to explore the relations between the interface levels with respect to Binding phenomena.

3.7   Binding and Switch-reference

Switch-reference (SR) is the phenomenon in which the subject of an embedded clause formally indicates whether this subject should be interpreted as coreferential or noncoreferential with the subject of the matrix clause.

Following Finer (1985), **Broadwell** (this volume) analyzes Switch-reference in languages such as Choctaw, Chickasaw, and Amele as an instance of local binding from an A'-position, thereby extending the domain of application of the Binding theory. Variation in SR systems is argued to be dependent on the level of representation (DS, SS, or LF) at which the Binding theory applies.

A better understanding of SR requires a deeper insight into the typology of pronominal systems. If pronominal systems are not homogeneous across languages, it is to be expected that this will have far reaching consequences for the correct formulation of Binding principles related to Condition B. This topic is explicitly addressed in the contribution by **Frajzyngier** (this volume). On the basis of English, literary Polish, Mupun, and Lele, Frajzyngier proposes a division of pronouns into three groups as a function of their coreference possibilities: logophoric pronouns (bound within a sentence but not within a clause); switch reference pronouns (bound by an antecedent in discourse but not by the immediately preceding antecedent); and pronouns that may be bound within the same sentence or by an immediately preceding antecedent in discourse. Similar considerations can be extended to agreement systems.

4   Acknowledgements

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Hans Bennis, Pierre Pica & Johan Rooryck (eds)
Atomism and Binding

The sixteen papers in this volume provide a representative overview of the broad range of issues relevant to the study of binding phenomena in the generative framework.

Since the inception of the theoretical interest in coreferential relations in generative grammar, there has been a debate with respect to the question as to whether and how (co)-reference should be represented in the grammar. Notions such as '(co)-indexation', 'disjoint reference', 'free' and 'bound' play an important role in this discussion. Their relevance is explicitly analyzed in many articles of this volume.

The role of thematic information in binding theory constitutes another important line of inquiry. Various authors argue that thematic information largely influences binding phenomena, although the specific proposals expressing this relation differ quite substantially.

The discussion whether Binding theory is a component of sentence grammar or a part of discourse grammar is also pursued in this book. Many papers address this issue quite explicitly and delineate the respective roles of sentence and discourse grammar in novel and intriguing ways.

Further topics investigated in this volume include the decomposition of morphosyntactically complex anaphors, the relation between switch-reference and binding, and the role of binding with respect to control.

Although the particular issues discussed differ considerably, their unity lies in the empirical domain covered and the theoretical framework adopted. This collection of papers offers a unique picture of the state of the art in generative research on binding.

The volume contains contributions by Stephen Berman & Arild Hestvik, George Aaron Broadwell, Hamida Demirdache, Robert Fiengo & Robert May, Zygmunt Frajzyngier, Robert Freidin, Jeff Gruber, James Higginbotham, Hajime Hoji, Jan Koster, Howard Lasnik, Seth Minkoff, Gertjan Postma, Eric Reuland & Sigridur Sigurjónsdóttir, Ken Safir, and Christopher Tancredi. In their introduction, the editors attempt to pull together some of the main theoretical threads which run through the papers.