

## **Syntax, Binding and Patterns of Anaphora**

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### **Preface**

Since the inception of the Afranaph Project, the theoretical motivations for our interest in exploring the rich empirical evidence pertaining to patterns of anaphoric interpretation have been largely taken for granted, at least with respect to what has been visible on the website. However, in the course of writing a version of this essay for the *Cambridge Handbook of Generative Syntax*, I realized that it would be useful for visitors to the site to have a good source for references about the issues that underlie some of the areas we have chosen to focus on, both in our elicitations and in the anaphora sketches that we have written and that we will write in the future. Although this essay was originally written on the assumption that people who will read it are familiar with the assumptions of generative grammar, there are a number of issues, including those surrounding the interpretation of binding, the morphology of pronouns and anaphors, and some of the locality issues, that should still be intelligible, and hopefully useful, to those with less training in generative grammar. Section 4 is the most theoretical one, however, and may be hard to follow for those not brought up on generative grammar (I suspect it is not even easy for those with generativist training). The original audience for which the piece was intended included anyone who would like to expand their theoretical training by gaining some familiarity with the leading theories and with the empirical patterns of anaphora that have been central to theoretical discussion. I thought of this audience as graduate students and/or linguists who have not thought much about anaphora in the past, but would like to gain some sense of what is currently understood and discussed concerning these matters. Except for a few sections where I have made small revisions, this essay is much like the chapter that will be published in the *Handbook*, but it is possible this one will receive occasional update revisions, and so if it is to be cited, then the version number should be cited as well.

### **1.0 Introduction**

In this essay, I present what is understood about the portion of our innate human language faculty that permits us to understand the patterns of anaphoric possibilities permitted by linguistic forms and sentences that contain them. Although semantic issues intrude constantly, my primary focus is on the consequences of the pattern of anaphora for syntactic theory.

An *anaphoric relation* is typically said to hold whenever we relate the semantic value (or reference) of a linguistic form to the value of some previous or anticipated mention.<sup>1</sup> The syntactically determined distribution of possible anaphoric readings raises what Chomsky (1986a) called ‘Plato’s problem’ in a particularly poignant way. Native speakers have a great deal of knowledge about where anaphoric relations can and cannot hold, knowledge that is not sufficiently explained by the meaning of words or their exposure to the contexts in which they are spoken. Although the patterns of anaphora differ across languages in ways that we are still discovering, much of the variation seems systematic and some generalizations about anaphoric patterns are robust. As a result, linguistic theory has devoted a great deal of attention to anaphoric relations over the last 50 years and the analysis of anaphoric patterns has frequently influenced the direction of syntactic theorizing.

My goal is to give a portrait of a moment in our understanding of these matters. In so

doing, I will flag central discoveries and advances and present the major theoretical proposals and the concerns that motivate them. My coverage of the issues will not be complete or comprehensive and my theoretical biases will emerge frequently, but I hope that my presentation of the state of the art will provide a sense of the trajectory of the research in this domain of inquiry and draw attention to some open issues that we may hope the next generation of linguists will better understand. For reasons of space, my presentation will be empirically thin, but references are provided for those who are inclined to explore the issues in deeper detail.

Part of the art of every science is to narrow larger questions into smaller ones that permit feasible research programs, and so the divisions in this essay are designed to refine the questions that must be explored. Section 2 lays out some boundary conditions for the syntax/semantics interface that anaphora questions inevitably invoke, while introducing questions surrounding obviation and the distribution of non-local, non-obligatory anaphora. In section 3 we explore Chomsky's (1981) Binding Theory, the challenges it faced, and the strategies used to defend it. The families of theories that have been offered as more explanatory alternatives to the Binding Theory are sketched and evaluated in section 4. Section 5 explores the richness of anaphoric morphology and its consequences for the syntax of anaphora and is followed by brief conclusion.

## 2.0 The interface between syntax and interpretation

As a bit of convenient terminology, let us say that in any circumstance where two linguistic forms A and B are understood to pick out the same entity in a discourse that A and B are *coconstrued*. Because there are a variety of coconstrual relations, and not all of them are regulated by syntax, it is necessary to begin by distinguishing coconstrual types that bear on the syntactic pattern of anaphora and those that don't.

One key distinction between coconstrual relations, stemming from work by Evans (1980) and Reinhart (1983), is that between *coreference* and *bound variable anaphora*. In (1a) and (1b), the pronouns are coconstrued with their antecedents, *every boy* and *Alice*, respectively, where italics in the examples indicate that two terms are to be coconstrued.

1a) *Every Republican* loves *his* mother.

b) *George* loves *his* mother.

In (1a) the value for the pronoun varies with that assigned to the subject bound by the universal quantifier, such that each loving Republican is matched with his own mother. In (1b) it is possible to regard *his* as a bound variable to the subject position, such that its value varies with that of the subject, but since the subject picks out a unique individual, *his* can be no one but *George*. Alternatively, *his* could be 'merely coreferent' with *George*, such that the two terms happen to pick out the same individual in discourse, a reading that is sometimes called 'accidental coreference'. The bound reading is distinguishable from an otherwise coconstrued one in ellipsis environments like (2a,b).

2a) *Every Republican* loves *his* mother and George does, too.

b) *George* loves *his* mother and Bill does, too.

Example (2b) is ambiguous, keeping constant that *George* and *his* in the first conjunct are coconstrued, whereas (2a) has only the bound interpretation, namely, one where every Republican loves his own mother and George is another own-mother-lover. By contrast, (2b) also allows an interpretation where Bill loves George's mother. The bound reading interpreted in ellipsis contexts is called the *sloppy reading*, whereas the one that keeps the value in the first conjunct as a constant, is called the *strict reading*.

The usual way in which the sloppy reading is treated in the semantics is to treat the

pronoun as bound by a lambda abstract over the VP as in (3a) so that the second conjunct (3b) is interpreted as copying the value for the VP (see, for example, Heim and Kratzer, 1998, and especially Büring, 2005, for an extensive and more nuanced treatment of semantic binding).

3a) [<sub>TP</sub>Every Republican [<sub>T'</sub>Tns [<sub>VP</sub> $\lambda x$  (x love x's mother)]]] and  
 [<sub>TP</sub>George [<sub>T'</sub>Tns [<sub>VP</sub> $\lambda x$  (x love x's mother)]]]

Whatever the subject is for the first conjunct, whether it is quantified or not, if the lambda abstraction is a property of it, then the same lambda abstraction is a property of the subject in the second conjunct, in this case, *George*. The strict reading is the more problematic one, insofar as coconstrual in the first conjunct *requires* coconstrual under a strict or sloppy reading in the second conjunct. As a case in point, (2b) allows a strict or sloppy reading, but it does not allow a reading where *Bill* loves anyone other than his own mother or *George's* mother (if *George* is coconstrued with *his* in the first conjunct). To insure that the strict reading is the only other reading, not just accidentally the same one, some device must reliably assure coconstrual in the case of the strict reading. There is controversy about how this is to be achieved although in the last 20 years or so and how much has to be represented in the syntax, a matter to which we return (see Fox, 2000, on 'parallelism', and references cited there).

Not every form has the same potential to be a bound element. Proper names do not permit bound variable readings because their relations to referents are fixed (but see note 3).

Descriptions are generally classed with names in this respect, though for definite descriptions, the matter is more complex in ways that we will not delve into here (except in passing). Forms that must always have an antecedent in the sentence are generally called syntactic anaphors (in this essay, just 'anaphors'). Pronouns can be free to pick out any previous or anticipated mention as their antecedent, but as we have just seen, they can also be bound. What is striking about this classification, and most significant from the syntactic point of view, is that it is insufficient to predict the class of possible, impossible and/or limited coconstruals unless the structural geometry of sentences is taken into account.

There are at least three ways in which syntactic configuration influences possible coconstruals. C-command plays a role in the distribution of bound variable coconstruals, c-command and locality play a role in the distribution of anaphors, and c-command plays a role in a form of non-coconstrual called *obviation*, to which we turn shortly.

Consider first how the classical Binding Theory of Chomsky (1981) (henceforth, BT), addresses the questions related to anaphors and obviation. The BT is stated on the notions 'bound' and 'free', which in turn depend on what it means for two nominals to be coindexed.

#### 4) The Binding Theory

- a) An anaphor is bound in its Binding Domain.
- b) A pronoun is free in its Binding Domain.
- c) A name must be free.
- 5a) X binds Y if X c-commands Y and X and Y are coindexed.
- b) If Y is not bound it is free.
- 6) X c-commands Y if the node immediately dominating X also dominates Y and X does not dominate Y.<sup>2</sup>

The 'Binding Domain' introduces a *locality restriction on anaphors* which essentially limits the application of principles A and B to clausemate or coargument contexts, but we reserve discussion of the issues surrounding the locality restrictions for section 3. For this section we concentrate on what form(s) of coconstrual the BT regulates.

If we take 'bound' to be bound as a variable and 'free' to be not bound as a bound

variable, then much depends on whether or not a pronoun can be coconstrued with an antecedent it is not bound by. We have seen for strict readings that coconstrual without variable binding is necessary. Thus Principle B predicts that a pronoun like *him* in can be coconstrued with *George* as long as *him* is not a bound variable.

7)\**George* loves *him*.

This is the wrong result, however, since (7) does not have the status of (1b), which, for the strict reading, is a successful coconstrual that is not a bound reading in (as illustrated in (2b)). BT contemporary definitions of Binding Domain, to which we will soon return, were devised to insure that the subject would be local to the direct object and not the possessor of a nominal so as to prevent (1b) from falling under Principle B. However the problem now is that if the strict reading is not a bound reading in the antecedent clause of (2b), then the theory needs to distinguish not only bound coconstrual and not-bound coconstrual, but some sort of enforced non-coconstrual, or *obviation*. Principle B must insure that a pronoun is not only free but obviate with respect to potential binders in its local domain.

I will return to Principle B in subsequent sections, but for the rest of this section I concentrate on (4c), known as *Principle C* in the literature (which is a restatement of a principle proposed by Lasnik, 1976), because most of the discussion of obviation in the literature has centered around the interpretive force of Principle C.

Principle C predicts that (8a) is excluded, because the pronoun *he* binds *the CEO*, on the assumptions (a) that definite descriptions (other than pronouns and anaphors) are treated as names, (b) that (all) coconstrual=coindexing, and (c) that *he/Jones* c-commands *the CEO*.<sup>3</sup>

8a) *He/Jones* has been said to have criticized *the CEO's* mother.

b) *His/Jones'* accountant has been said to have criticized *the CEO's* mother.

c) *He/Jones* is in a lot of trouble. We believe that *the embattled CEO* will soon be arrested.

Where the pronoun does not c-command, as in (8b), or when it is not in the same sentence as the name (8c), Principle C does not block coconstrual, although examples like (8b) and (8c) are subject to discourse effects, and 'backwards' anaphora cases like (8b) (with the pronoun) are sometimes regarded as degraded.<sup>4</sup> The issue that arises for Principle B now arises again: Should coindexation in the BT refer to any coconstrual, or to some limited set of coconstrual relations, such as bound variable anaphora?

Grodzinsky and Reinhart (1993), following Reinhart (1983), take the position that coindexation, insofar as it is necessary at all, only notates bound variable relations. They argue further that Principle C effects (obviation) follow from an independently necessary restriction on bound anaphora, which I informally restate in (9b) and the pragmatically interpreted principle in (10).<sup>5</sup> The significance of (9a) is to insure that wh-traces (or traces of quantifier raising) are defined as variables which, given (9b), are potential antecedents for pronouns and anaphors bound as variables.

9a) An empty category is a variable if it is A'-bound by a quantifier.

b) A pronoun or anaphor that is interpreted as a variable must be A-bound.

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

Rule I is designed to favor bound anaphora as the best form of coconstrual whenever it is possible, and it is possible wherever a pronoun or anaphor can be A-bound (by (9b)). The effect of Rule I is as follows: If the speaker could have used a pronoun eligible for a bound interpretation (and hence the favored form of coconstrual), but instead the speaker uses something other than a pronoun, then the hearer must assume that the speaker does not intend to

express coreference. Pronouns are almost always available in positions where names are c-commanded by their purported antecedents, and while pronouns and anaphors are possible bound variables, names and non-pronominal descriptions are assumed not to be.<sup>6</sup> Thus in (8a), *the CEO* could be replaced by *his* under coconstrual with *he/Jones*, and the result would satisfy the condition on bound anaphora in (9a,b), so the use of a name, *the CEO*, in place of a bound variable is illicit, unless there is some different manner of coconstrual intended (i.e., a coconstrual that is distinguishable from a bound variable interpretation).

Thus Rule I purports to derive Principle C, but it does so by distinguishing bound variable anaphora from other sorts of coconstrual which are assumed to be intrinsically less favored. Moreover, it assumes that there is a level of comparison between representations where one coconstrued interpretation is determined to be distinguishable from another, a matter to which I return in 4.2. The key effect of this approach, however, is to treat obviation differently from other coconstrual relations, in that obviation, unlike bound variable anaphora, is a pragmatic effect based on structural/representational options.

One advantage of treating Rule I as a pragmatic inference is that some apparent counterexamples to Principle C (raised by Evans, 1980, and Reinhart, 1983) appear tractable if we assume that coindexing of BT and Rule I only records bound anaphora, and that ‘mere coreference’ and obviation are not indicated in the grammar at all. For example, (11a-c) were taken to be problematic for BT Principle C since coconstrual persists where Principle C predicts name should be free (which, when Principle C was introduced, was intended to result in obviation).

11a) John is Bill

b) If everyone loves Jack, then I suppose it’s safe to say that (even) Jack loves Jack.

c) I know what Max and Jane have in common. Jane thinks Max is terrific and Max thinks Max is terrific.

Copular constructions like (11a), where *John* and *Bill* must be coconstrued even though *John* c-commands *Bill*, are no longer a problem, because *Bill* is not construed as a bound variable of *John* or the sentence would not be informative. The point of (11a) is to unite information about John and Bill such that what have been taken to be two distinct discourse referents should be understood as one. Since this form of asserted coconstrual could not have been expressed by a bound variable, Rule I does not predict obviation. Turning to (11b), the point of the deduction is to elucidate the set of Jack-lovers, not the set of self-lovers. Substitution of the last *Jack* by a reflexive would yield an interpretation where Jack is a self-lover (a bound reading), but this is not the point the speaker is making, rather the speaker asserts that Jack is included in the larger set of Jack-lovers, not the larger set of self-lovers (see Safir, 2004a:27). A similar point can be made for (11c), in that the sentence is enumerating the members of the set of people who think Max is terrific (not people who regard themselves as terrific), and Max is a member of that set. Moreover, latter two readings are confirmed not to be bound variable readings by the ellipsis test - only strict readings are possible (i.e., where Mary loves Bill in (12a) and Alice doesn’t think Max is terrific in (12b)).

12a) If everyone loves Bill, then I suppose it is safe to say that Bill loves Bill, and that Mary does, too.

b) Max and Jane have something in common that they don’t share with Alice. Jane thinks Max is terrific, and, of course, Max thinks Max is terrific, but Alice doesn’t.

Thus the ‘obviative’ effect of Principle C is not one inducing non-coreference nor disjoint reference (see Safir, 2004a: 45-48, contra Lasnik, 1976, 1981:151-2), but the result is a

pragmatic inference of expected non-coconstrual induced by a syntax-based condition. The obviation effect can be overcome in the right context, such as in (13), where *even* is taken to adjust expectations, i.e., even the individual least likely to hate Bill's mother hates Bill's mother.

13a) Even *Bill* hates *Bill's* mother.

b)\*Crazy *Bill* hates (crazy) *Bill's* mother.

Though other approaches treat the syntax-based condition differently (see 2.1), and some treat the pragmatic effect differently (e.g., Koster, 1997), the obviation reading (expected non-coconstrual), and thereby the conditions by which it is neutralized, is part of what is syntactically induced by whatever achieves the interpretive result of Principles B and C.

To briefly summarize, I have distinguished two forms of coconstrual, bound variable interpretation and coconstrual without bound variable interpretation (*mere coreference*, as in cases of backwards coconstrual like (8)). I have also delved into one form of non-coconstrual, obviation. Principle C is an attempt to bring c-command to bear to predict patterns of obviation. In place of Principle C, R&G relate the c-command condition on bound variable anaphora to the obviation effects through a pragmatic inference rule, Rule I. Thus obviation is treated as a pragmatic effect triggered (a) by a syntactic condition on bound variable anaphora and (b) a preference for bound variable readings over other forms of coconstrual.

## 2.1 C-command and bound variable readings

The syntactic cornerstone of Reinhart's approach is (9), which licenses a semantic bound variable reading for the pronoun only when it is syntactically A-bound by a variable. On the assumption that a trace of wh-movement is a variable (by (9a)), this condition derives *crossover effects* (first observed by Postal, 1971), such as that in (14a) (which cannot mean 'the man who praised himself left town'). Postal noted that the wh-phrase had 'crossed over' the pronoun while moving leftward in (14a,b), but not (14c).

14a)\*The man *who he* praised *t* left town.

b)??The man *who his* mother praised *t* left town.

c) The man *who t* praised *his* mother left town

Wasow (1979) distinguished violations of cases like (14a) from (14b) as cases of *strong crossover* vs. *weak crossover*, respectively. In strong crossover examples like (14a), (9) is violated *and* the coconstrued pronoun c-commands the trace. Weak crossover cases like (14b), which Wasow regarded as resulting in weaker unacceptability, also violate (9), but the pronoun does not c-command the trace.<sup>7</sup> By contrast, (14c), which satisfies (9), permits a bound reading.

The distribution of crossover effects has been taken to be a very important diagnostic of movement-generated structures since Chomsky (1977), and thus has played an important role in syntactic argumentation. The crossover effect diagnostic was used to justify covert syntactic movement of in situ quantifiers to scopal positions (quantifier raising, as in May, 1977, and much subsequent work) leaving a trace that counts as a variable by (9a). Thus in (15a,b), *every man* moves to establish scope over the clause, as in (16a,b), respectively, but in doing so, the same configuration as in (14b) obtains for (15a) as represented in (16a), where *t* does not bind *his*. Once again, (9) predicts a weak crossover effect.

15a) ??*His* mother loves *everyone*.

b) *Everyone* loves *his* mother.

16a) *everyone* [ [*his* mother] loves *t* ]

b) *everyone* [ *t* loves *his* mother ]

Unfortunately for (9), bound variable readings for pronouns are also possible in contexts

where c-command does not hold, and sloppy readings are supported, as in (17a), an inverse linking case (see May, 1977) and the possessive construction in (17b), which allows sloppy readings even without a quantified antecedent, as (17c) shows.

- 17a) Someone in *every Chinese city* loves *its* weather, but no one in any Siberian city does.
- b) *Everyone's* mother loves *him*, but no one's accountant does.
- c) Some people have mothers who love them. *George's* mother loves *him*, but I don't know if Bill's mother does.

One strategy in the face of apparent counterevidence is to defend (9) by making ancillary assumptions. Thus Kayne, (1994:23-4), assumes that adjoined positions to DP c-command out of DP, though somewhat arbitrary assumptions about the A/A' distinction must be posited. Büring, (2005: 180-181) argues that these cases are instances of 'donkey pronoun' anaphora, as in 'Most men who own *a donkey* beat *it*' (even though universals in the position of *a donkey* do not permit this sort of anaphora, in contrast to (17a), e.g., 'Most men who own *every donkey* they feed beat *it*' is unacceptable) (see also Tomioka, 1999).<sup>8</sup> If (9b) is undermined, then the ability of Rule I to predict Principle C effects (obviation) is also undermined.

Higginbotham (1983, 1985) and Safir (2004a:32) take a different tack, abandoning (9) and generalizations like it in favor of the view that bound variable anaphora is possible wherever a pronoun is in the scope of the quantifier that binds it, but crossover occurs whenever the *Independence Principle* is violated (using here Safir's interpretation of Higginbotham's idea).

#### 18) The Independence Principle

If x (or z containing x) c-commands y, then x cannot depend on y.

Insofar as pronouns must depend on variables to be interpreted as bound variables, pronouns coconstructed with wh-traces must depend on those traces. In (14a), the pronoun c-commands the trace it depends on, violating (18), while in (14b), the pronoun is contained in a nominal that c-commands the trace, again violating (18). This approach captures the crossover effects insofar as bound variable readings are blocked, but the condition also allows for bound variable readings in cases like (17b), where the quantifier (or its trace after QR) does not c-command the pronoun bound as a variable.

At this point it is important to distinguish dependent identity readings, bound variable readings, and mere coreferent readings. A dependent identity reading is one where a pronoun depends for its value on another entity in discourse. The coconstructions in (11a,b,c) are not dependent identity readings. The broad prediction of (18) is that dependent identity is supported wherever (18) is not violated.

Quantifier-bound readings are a special subset of dependent identity readings where the antecedent is a variable (or a quantifier in situ, depending on the account). Since a pronoun must also be in the scope of a quantifier that binds it, some contexts where (18) is not violated still do not permit bound variable anaphora. Insofar as the scope of quantifiers does not extend across independent sentences, dependent identity pronouns are not bound by quantifiers extra-sententially, as illustrated in (19a). On this account, strict readings, such as the one possible for (19b), are dependent identity readings permitted across sentences by the Independence Principle.

19a) John loves *everyone*. \*Mary likes *him/them* too.

b) A: John loves *his* mother.

B: So what, Bill does, too.

Recall that in (19b), either a strict reading (Bill loves John's mother) or a sloppy one (Bill loves his own mother) is possible, but here the cross-sentential anaphora is not 'mere coreference', but dependent identity, enforced by the parallelism that licenses ellipsis generally. Thus the typology

of coconstrual readings includes dependent identity cases that are not quantifier-bound, those that are, and mere coreferent readings, which are not dependent identity cases. VPs with bound readings antecede sloppy readings in ellipsis contexts, but they can also license strict readings by dependent identity with the pronoun of the first conjunct, since (18) is not violated. When the antecedent of the elided VP has quantifier-bound pronoun, however, the strict reading fails because quantifier scope fails, not because of (18). This predicts that if a quantifier has scope (determined by c-command at LF) over both the ellipsis site and the VP that licenses it, even strict readings can involve bound variables.

20) *Every boy* claims that *he* loves *his* puppy and that St. Francis does too.

The sloppy reading of (20) is one where St. Francis loves his own puppy, but the strict reading, where St. Francis loves each boy's puppy, is also a quantifier-bound reading (i.e., it is not 'accidental', contra Hicks, 2009:122), enforced by the same parallelism constraint independently required in every account. Most accounts will yield the same semantic result, but only if it is admitted that strict readings involve an enforced identity reading that is not achieved by mere coreference.<sup>9</sup>

## 2.2 Representing dependent anaphora

In the history of generative grammar, the way that the relation between coconstrued terms has been notated has often been taken to be a substantive issue with consequences for syntactic form. It is clear, at the minimum, that we must know whether or not *Velma* and *her* are coconstrued and not merely coreferent in order to know whether or not (21) is acceptable, or if the morphologically distinct *herself* is necessary.

21) *Velma* praised *herself/her*.

As a matter of non-theoretical notation, we have notated coconstrual with matching italics, but in what follows we consider some other ways that coconstruals have been notated and/or distinguished.

Indices were employed to mark coconstrual from the earliest work on anaphora in the generativist tradition (e.g., Ross, 1967), but coindexation became part of posited mental representations only when traces (particularly, Chomsky, 1977) and the definition of binding (in (5)) became part of the theory. Interpretive schemas for indices were proposed (Chomsky, 1980, 1981, Lasnik, 1981: 125-133, Fiengo and May, 1994). On some accounts, a phrase could bear an index '*i*' whether or not any other phrase in the structure bore *i*, and DPs, if they happened to have the same index, would covary for coconstrual. Phrases that do not bear the same index are treated as not coconstrued (e.g. Chomsky, 1980) or, as Fiengo and May (1994) put it, there is no linguistic commitment to whether they are coconstrued or not. Some indexing systems, like that of Fiengo and May, distinguished forms of coconstrual, such as bound variable coconstrual, in the sloppy reading for VP ellipsis, and coreferent coconstrual, in the case of the linguistically enforced strict reading for VP ellipsis.

As part of the minimalist program, Chomsky (1995) rejects the idea that indices are properties of nominals in syntax at all. There are two motivations for this position. The first is that indices violate 'inclusiveness', a theory-internal requirement within minimalism that no new grammatical entities may be introduced into the derivation that are not in the initial numeration (where the numeration is the set of forms that are the input to a derivation). The second motivation is based on the view that the actual reference of a nominal is not a syntactic property of the nominal, but only syntactically regulated coconstrual relations between nominals must still be expressed. Higginbotham (1983, 1985) proposes an alternative to indices that meets the



second criterion (but is still inconsistent with inclusiveness). Dependent nominals are related to their antecedents by an intrinsically asymmetric notation as in (22).

22a) *He* brought a copy of *his* book.

┌──────────────────┐  
|  
b) *John's* brother wrote to *him*.

┌──────────────────┐  
|  
c) *Who* did John see *t*?

This way of representing dependency never attributes a syntactic property to any nominal, except in relation to its antecedent. The value for *his* is thus a function of the value assigned to *he* in contexts where (22a) is uttered, but there is no syntactic commitment as to the value of *he*.<sup>10</sup> In the same fashion, *him* depends on *John's* in (22b). Note also that movement relations, which propagate an index in indexing approaches, must be converted in this approach to dependency arrows. However, something special must apply to convert copies of quantifiers to dependent variables in any theory, as discussed below.

In the arrow approach, every dependent identity relation is notated by an arrow connecting the antecedent with the dependent nominal. Thus mere coreference, as opposed to *dependent identity*, is invisible to syntax, apart from the (neutralizable) expectation of non-coconstrual induced by obviation, as mentioned above. Restrictions on coconstrual are expressed as restrictions on the distribution of arrow relations rather than the BT notion of binding.

Every theory requires some representation of bound coconstrual accessible to syntax or the interpretation of tree geometry, or there would be no way for syntax to regulate these relations. Although the arrow notation eliminates indices as properties of nominals, neither indices nor arrows satisfy Chomsky's inclusiveness restriction, nor is it clear that any existing proposal for indicating coconstruals relevant to the evaluation of syntactic configurations can satisfy inclusiveness.<sup>11</sup>

### 2.3 Coconstrual as Movement

With the objective of reducing identity relations in syntax to a bare minimum, Kayne (2002) and Hornstein (2001), amongst others, have suggested that the identity relation involved in coconstrual at a distance is the same one that is involved when a constituent is displaced, i.e., dependent coconstrual is generated by movement. On the assumption that relations between where a constituent begins and where it lands are copy relations (as in Chomsky, 1995), as all coconstrual-as-movement (CAM) theories do, the hypothesis space can be summarized as in (23).

23a) All dependent identity relations are interpretations of copy relations.

b) Some dependent identity relations are interpretations of copy relations.

c) No dependent identity relations are interpretations of copy relations.

We can regard (23c) as a non-starter, since every theory that produces (24b) must achieve an interpretation of (24a) that amounts to (24c) (see, e.g., Chomsky 1976 and Fox, 2003), and so at least some copy relations have to be translated into dependency relations.

24a) Which person did John see?

b) *which person* [did John see *which person*]

c) 'For which x, x a person, John see x'

Thus (24) is enough to establish that at least (23b) is supported. To support (23a), however, coconstruals like those in (25) must all be movement induced, since they are bound variable

readings, as illustrated by the success (indeed, the necessity) of the sloppy identity interpretation.

25a) *Every boy* likes the coach who flatters *him*, but not every father does.

b) *Most people* know what *they* want to do, but Bill doesn't.

Since wh-movement is impossible from the position where the pronouns in (25a,b) are found, CAM accounts must posit a form of movement unlike any other known, or they must accept (23b). If coconstrual is only partially determined by the distribution of possible movements, then the argument from parsimony for the CAM theories disappears (see Safir, 2008:346, for a stronger statement). Thus both movement and some other (unbounded) relation of coconstrual must be weighed as analytic options for any given phenomenon.

Further reasoning about the relation between movement and coconstrual requires further assumptions. The copy relation that results from movement operations in minimalist theorizing is an indistinctness relation (occurrences are not distinguishable by virtue of their internal properties since only one object is involved). Pronouns are in a dependent identity relation as indicated by the availability of strict and sloppy readings for pronouns represented in (26).

26a) John loves his mother and Bill does too.

b) *John* loves *his* mother and **Bill** [loves *his* mother] too.

c) *John* loves *his* mother and Bill [loves *his* mother] too.

As will be demonstrated later (see examples (73-74)), reflexives permit both strict and sloppy readings in a productive class of ellipsis contexts as well, so if pronouns are in dependent identity relations, then English reflexives are too (but see 5.2, for some indistinctness cases). Thus the attempt to represent coconstrual as nothing more than the copy relation fails to express the necessary range of dependent identity relations, at least without further elaboration (see chapter 15b of the *Cambridge Handbook of Generative Syntax* for a discussion of control relations).

Hornstein (2001), extending an analysis he proposes for obligatory control, defends the position that relations between copies generated by movement are what instantiate core cases of A-binding phenomena (on the assumption that movement from a theta-position to another theta-position is possible). He proposes, for example, that reflexives surface as a result of how copies are (or are not, in the case of obligatory control) spelled out in certain syntactic contexts. This proposal is discussed in 4.3.

Not all CAM theories have the same commitments. On Kayne's (2002) CAM theory, antecedent-trace relations are not necessarily treated as a copy relation (it is not crucial), but the key idea is that all coconstrual begins as a sisterhood relation between the elements coconstrued, and then one sister, the one understood as the antecedent, moves out, as in (27).

27a) [believes that [*John he*] is smart.

b) [*John* [believes that [ [*t he*] is smart]]]

This theory does not address differences between mere coreference and dependent identity and so it is not clear how strict and sloppy readings would be distinguished. Moreover, the theory makes radical assumptions, including that CAM requires movement out of islands, across different sentences, and across speakers in a dialogue.<sup>12</sup>

28) A: *Markus* is irritating

B: You should give [*t him*] a chance.

29) *Wilson* remembers the first person **who** [*t he*] met **t** in Wilkes Barre.

30) Arliss praises [*t himself*]

Kayne treats the two sentences in (28) as if conjoined and he derives coconstrual between *him* and *Markus* by movement of *Markus* from [*Markus him*] in the second sentence into the subject position of the first sentence. The same sort of derivation applies to (29), where the surface position of *Wilson* is achieved by movement out of [*Wilson he*], which starts in the relative clause subject position, and moves to matrix subject position. In (30), as in the first two cases, movement, the antecedent moves from the ‘shell’ into a theta-position where it gets its theta-role (the shell itself receives a theta-role in its initial position), in this case stranding a reflexive. Thus movement that preserves coconstrual on the basis of underlying sisterhood, but ‘CAM-movement’ must be able to violate islands, be intersentential, and, following Hornstein (1999), be able to move a nominal into a theta-position, an operation forbidden in Chomsky (1980).

Kayne’s theory is thoroughly consistent in that all coconstrual regulated by syntax is notated in the same way, i.e., all coconstrual relations begin as sisterhood relations that are extended by movement of the antecedent out of a shell, but the price for syntax is high. Although Kayne’s CAM theory has not been adopted whole by anyone else at this writing, some CAM subextraction analyses have been inspired by it.<sup>13</sup>

## 2.4 Summary

Any plausible theory of anaphora must distinguish relations of dependent identity, pronouns bound as variables, and obviation, and should account for the syntactic restrictions that hold of these forms of coconstrual. Pronouns must be in the scope of the quantifiers that bind them, where scope and binding are regulated by c-command, though there appear to be dependent identity cases that hold where c-command does not. The contributions of syntax and pragmatics were distinguished for principle C effects: A name cannot depend on any nominal that c-commands it and is in an obviative relation with its c-commanders. Obviation can be understood as the presumption that coconstrual between Y and X is unexpected, unless some discourse context overcomes the presumption. Obviated dependent identity coconstruals, however, are not recoverable in the same way. If Reinhart and Grodzinsky’s (1993) approach is defensible, then Principle C follows from the constraint on bound variables in (9) and a pragmatic rule, Rule I, but the status of (9) has been challenged by the alternative accounts of Safir and Higginbotham.

The question was raised as to whether indices or arrows are the best notation to characterize the relevant relations that syntax must be sensitive to, but neither indices nor arrows reduce to any other necessary relation, such as movement. Attempts to reduce dependent coconstrual to the distribution of movement copies fall short in present formulations, both insofar as indistinct copies must be converted to quantifier-variable dependencies, and because a radical extension of possible movement relations would be required to cover bound pronoun anaphora.

## 3.0 Binding Theory and local domains

The locality restrictions on anaphora have played a major role in the development of syntactic theory, especially since the early 1970s. Chomsky (1976), for example, argues that the syntactic restrictions that regulate relations between antecedents and the pronouns, reciprocals and reflexives they can be identified with are the same restrictions as those that hold between subject positions and their traces in passive and raising constructions derived by movement. In particular, the Specified Subject Constraint and the Tensed S constraint were taken as applying generally to rules of grammar, including movement and restrictions on local coconstruals. This

apparent unification continues to play a role in syntactic theorizing.

### 3.1 Classic Binding Theory

The constraints on rules of the 1970s were rethought in Chomsky's (1981) Binding Theory (BT) in terms of locality domains conditioning possible coconstrual relations, relations that are otherwise freely possible - i.e., not created by rules of grammar. Coconstrual relations were reduced to the three BT principles in (4) and the locality constraints of the 1970's were recast as the Binding Domain.

31) Binding domain: The binding domain for  $\alpha$  is the minimal IP containing the governor of  $\alpha$  and a SUBJECT accessible to  $\alpha$ .

32) The class of anaphors includes reflexives, reciprocals, and A-traces.

Typical phenomena captured by BT Principles A and B are exemplified in (33a-e).

33a) *The men love themselves/each other/\*them.*

b) *The men* expected [<sub>CP</sub> that [<sub>IP</sub> *they/?\*each other/\*themselves* would be happy]]

c) *The men* expected [<sub>IP</sub> *themselves/each other/\*them* to be happy]

d) *The men* expected [<sub>IP</sub> me to love *them/\*each other/\*themselves*]

e) *They/\*themselves/\*each other* implicated *themselves/each other.*

The notion SUBJECT simply requires that an IP is only a binding domain if it has a structural subject (overt or PRO) or a finite tense (we ignore 'accessibility', but see 3.3). In a simple clause, as in (33a), the application of Principles A and B is straightforward, insofar as *the men* locally binds the anaphors, *themselves* and *each other*, satisfying Principle A, but *them*, if bound by *the men*, violates Principle B. With the advent of abstract Case theory, (33a) and (33b) are distinguished because in (33b), the Case of the subordinate subject is provided within the subordinate clause (Nominative assigned by [+tense]). By contrast, the source of Accusative Case in (33c) is the matrix 'exceptional Case-marking' (ECM) verb *expect* given the sort of infinitival complement *expect* can take (as a special lexical property, it is posited to take an IP infinitive). If a Case assigner is a governor, then the binding domain for the pronouns and anaphors in (33c) is taken to be the matrix clause, where local binding permits anaphors but not pronouns. In (33d), the bound anaphors/pronoun are assigned Case (and governed) by the subordinate verb *love*, and thus cannot access the higher domain including *the men* in the matrix clause, with predictable results. Examples like (33e) do not permit anaphors to be in subject position because they are not bound.<sup>14</sup>

For the data described so far, a version of Binding Domain for  $\alpha$  based on Case governors would be sufficient, whereby the binder must be in the same IP (clause) as the minimal IP which contains its Case assigner, but such a definition would not then extend to (34a-c).

34a) *Karl* was killed *t*.

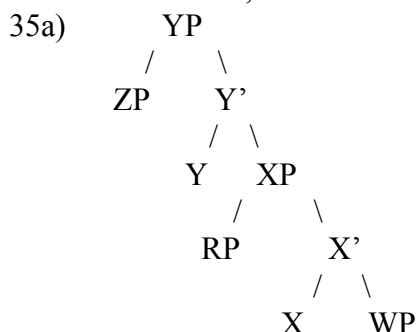
b) *Sarah* seems [<sub>IP</sub> *t* to be guilty]

c) *Excalibur* was expected [<sub>IP</sub> *t* to be heroic].

In the theory of abstract Case, every overt nominal phrase (DP or NP, depending on developments in X' Theory) must be Case-marked, and in movement theories of passive and raising, movement can thus be motivated as a search for Case. Passive verbs are posited not to assign Accusative, so *Karl* must move from object position, where it gets its patient theta-role, to subject position, dethematized by a lexical operation, where it can get Nominative Case. The infinitival subject of the complement of *seem* and of passivized ECM *expect* moves for the same reason, but in all three examples, the trace is thus Caseless. Therefore Binding Domain cannot be

defined as the clause containing the Case assigner if it is to extend to the trace of A-movement.

‘Government’ was introduced into the definition of Binding Domain to permit the generalization of anaphoric domains to apply to both raising verb complement subjects, passive objects, and ECM verb complement subjects. Definitions of government were various, and are not pertinent here, but it is enough to say that a head ( $X^0$ ) was understood to govern anything immediately dominated by one of its projections, as well as the head of its complement, but could only govern into the specifier of its complement if the complement were IP (e.g., not CP or DP). Thus in the schematic diagram in (35) Y governs ZP, XP, X’ and X, but not RP or WP, unless XP is in fact IP, in which case Y would also govern RP.



b) Elsbeth expects [<sub>IP</sub> him to leave]

It was assumed that a Case assigning head must govern the assignee, but raising and passive verbs, which do not assign Case, would still govern the traces that follow them, since a complement NP (DP in later work) is a daughter of V’, and the trace of raising is the specifier of an IP complement of the raising verb. In (35b), if the complement of *expect* is an IP (as XP is the complement of Y in (35a)), then *expect* governs the Spec of IP (=RP) and assigns it Accusative Case. In (34c), passivized ECM *expect* governs the subject trace in its infinitive complement, just as a raising verb does.

The achievements of the BT were considerable, including the unification of Case Theory and BT under government, the reduction of locality restrictions on A-movement to Principle A, and deriving the PRO theorem (which proved chimeric, but that is discussed in chapter 15b of the *Cambridge Handbook of Generative Grammar*). Combined with a theory of (non-)coconstrual representation, BT was a comprehensive theory of anaphora with wide empirical coverage, and it stimulated a flood of crosslinguistic study exploring its predictions. For subsequent work that has sought to improve on its empirical predications and/or reduce its theoretical assumptions, BT has served as the point of departure (as it is in this essay).

Moreover, BT effects have played an important role in diagnosing other constructions and detecting the existence of empty categories. For example, the existence of structurally represented null antecedents has largely been supported by the BT effects that are correctly predicted if the null categories are posited.

36) To praise *himself/him/the guy* would embarrass *John*.

While the object of *embarrass*, *John*, can be coconstrued with any of the forms after *praise*, the possible interpretations of the one doing the implicating is notably restricted. If the ‘praiser’ is understood to be John, only *himself* is possible. If the praiser is not John, then it is possible for *him* and *the guy* to correspond to John. These results are exactly what is expected if a structurally present null subject of the infinitive is assumed to be present, such that it c-commands the direct object of *praise*.

37a) [<sub>CP</sub> [<sub>IP</sub> [<sub>CP</sub> [<sub>IP</sub> PRO<sub>i</sub> to praise *himself*<sub>i</sub>/\**him*<sub>i</sub>/\**the guy*<sub>i</sub> ] ] ] would upset *John*<sub>i</sub> ]

b) [CP [IP [CP [IP PRO<sub>i</sub> to praise \**himself/him<sub>i</sub>/the guy<sub>i</sub>*] ] ] would upset *John<sub>i</sub>* ]  
 If PRO bears index *i*, then only *himself* is possible as the direct object of *praise* to satisfy Principle A, because *him* and *the guy* would be excluded by Principles B and C, respectively. If PRO bears an index that does not match that of *John*, then *himself* fails by Principle A, but *him* and *the guy* can be coconstrued without violating Principles A or B. Such reasoning is still considered diagnostic of syntactically present unpronounced subjects, as it is for null subjects of tensed sentences in the languages that allow them.

BT faced many challenges, however. From a conceptual perspective, there was no principled account of why pronouns should be different from anaphors, why pronouns should only behave specially in a local domain, and why the local domain in which pronouns behaved specially should happen to be the same one in which anaphors had to be bound. The notion ‘syntactic anaphor’ risked circularity, since anything respecting Principle A could be treated as one. The last question bore on the status of A-movement - should A-trace be an anaphor or should anaphors be unified as A-traces? The theories discussed in section 4 address most of these questions.

Other questions addressed the level of application of the BT. Most accounts assumed that BT applied at LF, after reconstruction,<sup>15</sup> but Belletti and Rizzi (1988) argued that Principle A, as opposed to Principles B and C, should apply at any point in a derivation where it could be satisfied, on the basis of examples like (38a), and others have appealed to (38b).

38a) Pictures of each other would please the boys.

b) The men wondered which pictures of each other the journalist would publish.  
 Belletti and Rizzi were arguing that psych predicates like *please* derive from an underlying structure where *pictures of each other* originates in a position c-commanded by *the boys*, and that binding in the pre-movement position is enough to satisfy Principle A, which would not be satisfied at S-structure. Conversely, movement of *which pictures of each other* in (38b) brings the anaphor close enough to its antecedent only after movement. Binding by Principle A at the first opportunity covers both cases. Under copy theories of movement, the point can be put differently, insofar as at least one copy of an anaphor must be bound at LF. Some would dismiss evidence based on *picture nominals*, however, which may be more freely bound for other reasons (see 3.3). The matter remains open.<sup>16</sup>

The BT formulation of Binding Domain also faced many empirical challenges. As attempts were made to apply BT to other languages, it was discovered that forms taken to be anaphors could be sensitive to a variety of domains, both smaller and larger than in English. Questions were raised about the complementary distribution of pronouns and anaphors, suggesting that the domains for anaphors and pronouns could differ (even in English, see Huang, 1993). Some languages have anaphors that require that their antecedents be subjects (see, for example, Safir & Sikuku, forthcoming, on reflexive markers in Lubukusu, a Bantu language, where what counts as a subject is explored) or not be subjects (Scandinavian pronoun-SELF, see Hellan, 1988). Finally, the notion ‘anaphor’ itself received scrutiny, as attempts were made to account for the varieties of anaphoric forms, both in languages with morphologically impoverished distributions of anaphors, and those with richer anaphor morphologies and more highly articulated locality distributions (see 3.2-3 for discussion and references concerning the variety of locality domains and section 5 concerning the morphological varieties of anaphors). Thus the elegance and generality of BT appeared threatened by the richness of typological variation.

### 3.2 Defending the classic BT

There were two main responses to the empirical challenge posed by the existence of variation in the structural distance permitted between antecedents and anaphors. One response was to increase the set of binding domains parametrically available, while the other was to insist on a single domain and derive divergence from it from other interfering factors.

Manzini and Wexler (1987) (M&W) is an exploration of the first strategy. They proposed a parameterized set of locality domains for binding (drawing from Yang, 1984), one fitting inside another, and that the lexical entry of an anaphor specifies which domain it is bound in. M&W propose the set binding domains (governing category) in (39) (details suppressed).

- 39)  $\gamma$  is a governing category for  $\alpha$  iff  $\gamma$  is the minimal category that contains  $\alpha$  and a governor for  $\alpha$  and has
- a) a subject; or
  - b) an INFL; or
  - c) a Tense; or
  - d) a “referential” Tense; or
  - e) a “root” Tense.

The difference between English *himself* in (40a) and Italian *sè* in (40b), illustrates the difference between (39a) and (39b). While (40a) is an instantiation of (39a), since only the Genitive is a possible antecedent for *himself* in English (for most speakers), (40b) instantiates (39b) insofar as the Genitive of the nominal and the matrix subject are both possible antecedents (in Manzini’s dialect).

40a) *Mary* saw [a/\*Bill’s description of *herself*]

b) *Alice* guardò i ritratti di *sè* di **Mario**

“*Alice* looked at **Mario**’s portraits of *her/him*.”

Scandinavian simplex SIG-type forms, which can be bound from a higher clause across infinitival (-tense) subjects, instantiate (39c), logophorically interpreted Icelandic *sig*, which can be bound across subjunctive (“non-referential”) clauses, instantiates (39d), and Chinese *ziji* which can be bound across any intervening clause, instantiates (39e). There is no obvious reason for this particular list of domains as opposed to some other, but M&W note an empirical generalization about the relation between domains, namely, that the positions for anaphors in each domain is a subset of the next larger domain such that  $a < b < c < d < e$ .

M&W maintain that binding domains are learnable because they respect the Subset Principle, which provides an acquisition strategy that a child can exploit to reliably arrive at the right setting for an anaphor based solely on positive evidence. If a child tacitly assumes, at least initially, that the domain for every anaphor is the smallest one, then every time she hears the anaphor used with an antecedent outside the most local domain, she posits a larger domain for the anaphor in question. Thus a child acquiring the anaphor *sè* in Italian will initially assume that *sè* is locally bound (e.g., by antecedents like *Mario*), but exposure to a sentence like (40b) will then reveal that the domain is wider. In the absence of evidence for an expanded domain, the initial assumption of a local domain prevails (hence the English setting, (39a), for *himself*). The inverse of this reasoning is employed for pronouns. Pronouns are initially assumed to be disjoint from potential antecedents in the widest possible domain; each pronoun coconstructed with a more local antecedent is evidence the child should assume a smaller obviation domain for pronouns.

41a) *Melba* thinks that *she* is smart.

b) *Melba* lifted *her* book.

c) \**Melba* forgave *her*.

If a child hears (41a,b), it is evidence that the domain in which pronouns can be coconstrued with an antecedent is rather small, but unless the child hears (41c), which she would not hear in English, she will assume (41c) is not possible,

Although the M&W approach was an important step in the direction of integrating acquisition data into the theoretical discussion of the patterns of anaphora,<sup>17</sup> it faced a number of difficulties, not least that it did not easily accommodate anaphoric distributions where one domain is not the subset of the other, as in the Norwegian pattern in (42).

42a) Vi fortalte *Jon* om *ham selv*/\**ham*/\**seg*/\**seg selv*.

“We told *John* about *himself*.”

b) *Jon* fortalte meg om \**ham selv*/\**ham*/\**seg*/*seg selv*.

“*Jon* told me about *himself*.”

The anaphor *seg selv* is subject sensitive and favors coargument interpretation, which means that it can only have a local subject antecedent, whereas *ham selv* can only have a local non-subject antecedent, i.e., their domains are complementary. Thus *Jon* in (42a) is not a possible antecedent for *ham selv*. It is possible to introduce distinct subset calculations for non-overlapping domains at the price of weakening the theory (see Safir, 1987). Moreover, positing locality domains as properties of lexical items affords lexical stipulation a wide-ranging descriptive power over structures in syntax. Alternatives to this approach aim to predict the domain of an anaphor from independently necessary aspects of its feature matrix as they interact with general principles, not by using the lexicon to stipulate the locality syntax of any item.<sup>18</sup>

Another approach to parametric variation of binding domains sought to show that anaphors that appear to have domains larger than those of English only differ only in that they permit abstract movement of anaphors into the local domains of their antecedents. Lebeaux (1984), Chomsky (1986a), Pica (1987), Battistella (1989), and Huang and Tang (1991), amongst others, developed accounts along these lines. Example (43a) is Chinese from Cole and Sung (1994), and a schematic version of such an analysis (not precisely theirs) for *Lisi* as antecedent is in (43b).

43a) *Lisi*<sub>i</sub> *kanjian* *neige* *taoyan* *ziji*<sub>i/j</sub> *de* *ren*<sub>j</sub>

*Lisi* see that dislike ZIII rel person

*Lisi*<sub>i</sub> saw the person who<sub>j</sub> dislikes him<sub>i</sub>/himself<sub>j</sub>

b) *Lisi* *kanjian* [<sub>DP</sub> *neige* [<sub>CP</sub> *taoyan* *ziji* *de*] [<sub>NP</sub> *ren* ]]

*Lisi* *ziji*-T *t*-V [D [ *t*-C... *t*-T *t*-V *t*...] NP]

BT Principle A applies after covert head-movement of *ziji* into the matrix clause and so the local binding domain of BT holds in (43) just as it does for English pronoun-*self*. The more local interpretation (‘the person’ antecedes) is derived if *ziji* moves only to the lower T.

Covert movement approaches thus preserve the classic BT binding domain in the face of linguistic variation by raising anaphors into the local binding domain (to highlight analyses of this class, I will call raising an anaphor into a higher locality domain a ‘hoisting’ analysis). For example, if ECM complement subjects were to raise into the higher clause,<sup>19</sup> then hoisted pronouns and anaphors could be locally bound by the matrix subject, respecting (31). Lasnik (2001:197) shows that ECM complement subjects do indeed behave as if in the higher clause because they can be controllers for adjunct gerunds construed with the clause of the selecting verb.

44a) The DA proved [*two men* to have been at the scene of the crime] during *each other*’s trials

b) The DA [<sub>VP</sub> *two men* [<sub>VP</sub> proved [<sub>IP</sub> *t* to have....] [<sub>PRO</sub> during *each other*’s trials]]]



If control antecedents must c-command PRO, then *two men* only c-commands in (44b), but that is only possible, Lasnik argues, if an ECM complement subject can be raised into the clause of its antecedent. However, as pointed out in Safir (2004a:149-50), if the analysis in (44b) and (45b) is correct, binding domain for English, if not generally, could be smaller than the domain that regulates A-traces, casting doubt on the BT assumption that A-traces and anaphors have the same domain.

45a) *The DA* proved *himself* to be incompetent by behaving irrationally

b) *The DA* [<sub>VP</sub> *himself*] [<sub>VP</sub> proved [<sub>IP</sub> *t* to be incompetent] ...

Safir (2004a) argues further not only that long-distance binding of anaphors is made possible by covert raising into a local domain, but that every covert hoisting analysis should correspond to a form of bounded overt movement, such movement attaching a clitic to a predicate that does not select it (see, in particular, Lee-Schoenfeld, 2004, for German), or operator movement that is restricted to pass through tenseless clauses (as in the case of *tough*-movement).

46a) Clausemate domain (e.g. the reflexive marker in Bantu languages, see Mchombo, 2006 and Safir and Sikuku, forthcoming for exploration of clausemate status in Lubukusu)

b) A-movement domain (extends to edge of subordinate IP and/or DP) (as in (45)).

(e.g. English *each other*)

c) clitic-binding domain (potentially out of PP) (e.g., German *sich*)

d) Tenseless operator domain (across infinitives) (e.g. Scandinavian SIG, see Hellan, 1988 and Hindi APNAA, see Davison, 2000)

Safir criticizes Cole and Sung (1994), who propose unbounded covert head movement through tensed clauses and across islands (as in (43)), a covert hoisting analysis that relies on a sort of movement that has no attested overt counterpart. As we show in 3.3, distributions corresponding to (39d,e) in the M&W classification should not be domains for anaphors at all, but fall under other generalizations.

Another potential advantage for hoisting analyses is that they can account for (anti-)subject orientation (Pica, 1987), on the assumption that the landing site of such movements is higher than the object and lower than the subject (e.g., head-adjunction to T, as in (43b)). Then the only c-commanding antecedent in the local domain is the subject. Movement of a reflexive to a Romance proclitic position, for example, would have this effect. Pica (1987), Hestvik (1992) and Avrutin (1994) also propose hoisting analyses for the anti-subject orientation of pronouns in Norwegian and Russian, respectively, although the assumption that pronouns must move to be disjoint from a local antecedent seems insufficiently motivated. The hoisting analysis remains attractive for many anaphors, if not for pronouns, though independent evidence for the covert movements of anaphors beyond analogy to overt movement types is sparse.

### 3.3 Local anaphors and non-local anaphora

An important empirical challenge to locality and complementarity concerns the fact that, in some of the world's languages, forms which are bound in the more local domains, like (39a-c) or (41a-d), also can also be virtually free, if certain semantic and pragmatic conditions are satisfied. For example, forms classed as anaphors because they can be locally bound when pronouns cannot, can in some languages, like Chinese, can be anteceded not only across tensed sentences and islands (43a), but also by non-c-commanding or even non-sentence-internal antecedents (47). Similar facts hold in widely dissimilar languages (see, e.g., Safir, 2004a:173-178, for examples from the literature and for further discussion).

47) *Zhangsan zhe ren yi-xiang hu-li-hu de guo shenghuo. Jushuo you yihui lian ziji fan-le-fa dou bu zhidao.*

“*Zhangsan* has always been absentminded. It was said that *he* once broke the law without even knowing it.

In Safir (2004a), forms of this kind are called unbounded dependent forms (UD-forms), forms that require an antecedent but are unrestricted by locality. UD-forms when locally bound tend to show interpretive contrasts with constructions where it is anteceded outside the bounded domain (see, e.g., Huang and Liu, 2001: 168-172). For example, non-local UD-forms are sensitive to discourse factors like point of view (or logophoricity, see below) while their locally bound versions are not. Thus UD-forms are cross-classified as local anaphors, on the one hand, and pronoun-like dependents on the other, permitting a distribution that amounts to the union of both domains of bound anaphora. Some UD-forms, like pronouns but unlike anaphors, even permit split antecedents (not *ziji*, but see Safir 2004a:177-8 for Turkish, Malayalam and Japanese examples from the literature). If non-local UD-forms are pronoun-like, overlapping distribution with pronouns outside their locality domains will lead to false counterexamples to the claim that pronouns and anaphors are in complementary distribution. It remains an open question whether there is any way to predict which anaphors are likely to be cross-classified as UD-forms.<sup>20</sup>

Another class of contexts that are apparent counterexamples to the complementary distribution of anaphors and pronouns are pronoun-*self* forms in English that behave like UD-forms in examples like (48a-c) (see Zribi-Hertz, 1989, Pollard and Sag, 1992, 1994, Baker, 1994, amongst others).

48a) In *John*'s perspective, pictures of *himself* kissing porn stars are not bad publicity.

b) *John* insists that the press would never have expected any superstar other than *himself* to play with such an injury.

c) *John* admitted that Mary and *himself* make a good couple.

However, most of the counterexamples posed can be classed as cases where pronoun-*self* is systematically ‘exempted’ from local binding. Some theories that address these cases, such as Reinhart and Reuland (1991:297-8), Safir (1993, 1997), Reuland (2001a) and Reinhart (2006), rely on the intuition that some anaphors are exempted from locality altogether in domains where there is no possible candidate for a local antecedent.

The execution of these theories is different, but for Reinhart and Reuland, an anaphor in a conjunction, as in (48c), is not itself an argument of a predicate, hence not susceptible to their Principle A. Safir points out that some anaphors cannot have a coargument antecedent by virtue of what the predicate means, as in (48b), where ‘x other than x’ is a contradiction. Other predicates, such as picture nominals, have no local structural antecedent (48a). Thus (48a-c) are exempted from local binding requirements. Reuland (2001a,b) takes a different tack, arguing that all anaphors are unbounded unless something forces them to be bound locally (e.g., local SELF-adjunction to a predicate). The domain of exempt anaphors is thus essentially unrestricted, as in the case of UD-forms.

Both exempt anaphors and UD-forms are typically conditioned by semantic and pragmatic factors that are related to point of view, or *logophoricity*, a term introduced by Hagège (1974) and widely employed since Clements (1975) to characterize a class of morphologically distinct pronouns or agreement markers that are used when the antecedent is the subject (usually of a propositional attitude verb. Languages differ as to whether there is lexical specificity of the predicates that trigger the effect, whether narrative point of view (sometimes called ‘logophoric center’) is sufficient to license the logophor, or if special syntax is involved. Reuland and

Sigurjónsdóttir (1997), for example, show that the Icelandic *síg* embedded in subjunctives is logophorically conditioned, but *síg* is not so conditioned in infinitival domains. Thus the M&W locality domain in (39d) appears to be a logophoric domain. From this perspective, Icelandic *síg* is an anaphor that happens to be cross-classified as a logophor.

Moreover, an anaphor may be cross-classified as a logophor, but logophors do not have to be anaphors. Gokana, for example, uses agreement affixes for this sole purpose (Hyman and Comrie, 1981), Ewe uses a special pronoun (Clements, 1975), and Amharic uses 1<sup>st</sup> person pronoun morphology (Schlenker, 2003). One key feature of logophoric forms is that when they are bound, the antecedent is understood to be aware of self-reference. Compare the Yoruba example (from Adésolá, 2004) in (49a), which employs a pronoun otherwise limited to binding by focus, and an Icelandic subjunctive example (49b) with *síg*.

49a) *Olu gbàgbópé ilé rẹ̀/òun ti wó.*  
 Olu believethat house he(w)/he(s) ASP fall  
 "Olu believes that his house has collapsed."

b) *Ödipus hélt að móðir sín hefði aldrei hitt fóður hans*  
*Oedipus* thought that mother *his* had-Subj-past never met father his  
 "Oedipus thought that his mother had never met his father."

With respect to the contrast in (49a), Adésolá remarks, "a strong pronoun is used when self-reference is intended by the reported speaker (or believer), while a weak pronoun is used when the reported speaker (or believer) does not know that he was in fact referring to his own house." The weak pronoun does not have to refer to Olu, but the strong one must. The same sort of fact is illustrated for Icelandic *sín* in (49b), which requires the interpretation that what Oedipus thinks is that the woman he, Oedipus, took to be his mother had never met his father. But (49b) cannot mean that Oedipus thinks that the woman who has never met his father is in fact his own mother. The English translation allows for the possibility that the person that only the speaker of (49b) knows to be his (Oedipus') mother has never met Oedipus's father. (see Safir, 2005:120 for discussion). Finally, the Yoruba strong form *òun* does not behave as an anaphor in local domains: Not only can it appear in tensed subject positions and have split antecedents, but if it is bound by a clausemate logophoric pronoun, *òun* must be embedded in a reflexive (the Yoruba reflexive 'BODY-of-pronoun' with a weak pronoun is *ara rẹ̀*, but it is *ara òun* when bound by a local subject *òun* (see Adésolá, 2004:171, fn100).

50) *Olu ro pe oun ti korira ara ounju*  
 Olu thinks that he(s) (has) hated himself too.much

Thus the logophoric domain in (39d) is not the extended domain of anaphors, unless a given anaphor happens to be cross-classified as a logophor.<sup>21</sup>

The only other point to add here is that exempt anaphors and UD-forms also appear to prefer logophoric environments, but at this writing there are no point-by-point comparisons of, say, Yoruba logophoric contexts and those contexts where exempt anaphors are found in English.

### 3.4 Twilight of the BT

Thus BT faced many challenges, both theoretical and empirical. The empirical challenges of domain variation and (anti-)subject-orientation were initially met by parameterization of locality domains that weakened the universality of the local domain. Strategies that preserved the generality of local domains include the hoisting analyses, the cross-classification of anaphors with logophors and UD-forms and exemption of anaphors in certain structural contexts.

Moreover, the BT turns out to be the first of several theories designed to predict complementary distributions of the pattern of anaphora, and so the strategies pioneered to explain real or apparent breakdowns in complementary distribution in defense of BT turn out to have outlived that theory. Four such strategies that are typically applied, including (A) positing different structures for superficially similar strings (e.g., ‘*John* saw a snake near *him/himself*’), which is often addressed in terms of differences of thematic structure with associated predicates (as in e.g., R&R, 1993:663-664, 686-688) or in terms of embedded PRO ‘subjects’ for PPs (e.g., Hestvik, 1991), (B) positing distinct coconstrual relations (e.g. bound vs. merely coreferent interpretation, as in Grodzinsky and Reinhart, 1993), (C) positing cross-classification (e.g., anaphors and logophors or UD-forms), and (D) permitting anaphors with no local candidate antecedent to be exempted from locality requirements. Appeals to these strategies usually interact with special assumptions about morphology (see section 5).

It is primarily the theoretical shortcomings of BT, however, that drive new approaches. As minimalist thinking about the architecture of grammar emerged with Chomsky (1995) and earlier, BT began to look too rich in the number of principles involved, too isolated from other principles of grammar, and too stipulative about anaphorhood and locality. By focusing attention on these issues, BT set the stage for new thinking about the patterns of anaphora.

#### 4.0 Alternatives to BT

Most alternatives to BT aimed at reducing the number of principles involved by deriving the BT principles from independently necessary generalizations, on the one hand, and developing a more plausible model of the lexical properties that might account for the empirical diversity of anaphoric domains and pronoun distributions, on the other. Few alternatives to the BT present a comprehensive account of all the issues raised so far, but many contain a leading idea or two that differs from central concepts in BT in ways we will explore. Thus some of the counter-theories may seem incomplete, but research on a variety of fronts has led to hybrid accounts that careful readers of current literature may trace to parts of some of the theories discussed in this section.

#### 4.1 Predication-based theories

The classic BT does not appear to address one of the most widespread methods of forming reflexive sentences in the world’s languages, namely, affixation to a transitive verb in such a way that the resulting predicate lacks an overt object (both languages exemplified in (51) are SVO and ‘RFM’ is the gloss for ‘reflexive marker’).

51a) Jean se regarde. (French)

Jean SE looks.at

b) Yohani mwâyílangire (Kinande)

Yohani mo-a-a-yi-langir-e

JohnPST-SM.c1-TM-RFM-see-FV

Both: “John saw himself.”

While it is possible, within the BT approach, to analyze some of these constructions as instances where marking on the verb controls and in some way identifies a null object anaphor, the overlap with passive constructions in many languages (see 5.4) suggests the possibility that the affix is responsible for reducing the valency of the verb it attaches to. If there is an operation that renders a predicate reflexive, then the natural strategy from a theoretical point of view is to use it

to replace, as much as possible, what must otherwise be said about anaphora. Indeed the locality of Principles A and B provides a suggestive target, because locality of anaphoric relations could potentially *follow* from the necessarily local relations that a predicate enters into with its arguments.

One of the most influential approaches since classic BT is that of Reinhart and Reuland (1993) (henceforth, R&R), who claim that the local character of Principles A and B derives primarily from the fact that reflexivity is a property of predicates, on the one hand, and from the assumption that local binding is restricted by conditions on chains. Core principles of their system are presented in (52-53).

52) Condition A: A reflexive-marked syntactic predicate is reflexive

53) Condition B: A reflexive semantic predicate is reflexive-marked.<sup>22</sup>

54) A predicate is *reflexive* if two of its arguments are coindexed.

55) A predicate is reflexive-marked iff either P is lexically reflexive or one of P's arguments is a SELF anaphor.

The rough correspondents of Principles A and B in this theory are (52) and (53), respectively. In (56), the argument reflexive (*himself*) marks the predicate as reflexive (pronoun-*self* is [+REFL]), so the sentence is interpreted accordingly, but *John praised him* cannot be interpreted reflexively because it is not reflexive marked (independent pronouns are [-REFL]).

56) *Paul* praised *himself*/\**him*.

Since *Paul* and *him* are coarguments of *praise*, they are part of the semantic *praise* predicate and (53) applies. Reflexive marking, insofar as it applies to the predicate introduced by the verb, might be most naturally expected to be instantiated as a verbal affix, and indeed R&R suggest covert affixation of the *-self* portion of pronoun-*self*. They do not, however, treat French *se* as a reflexive marker, but instead assume, on analogy with Dutch *zich*, that *se* is a vestigial object. Dutch *zich* contrasts with *zichzelf* in that *zich* is primarily used with inherently reflexive verbs, as in (57a).

57a) *Hij* wast *zich*

he wash.past ZICH

'He washed'

b) *George* bewondert *zichzelf*/\**zich*

George admired ZICH-SELF/ZICH

'George admired himself.'

Verbs like this are intrinsically marked with a null reflexive affix in the R&R account, so Dutch has a null SELF morpheme attached to the verb. The appearance of the *zich* object is treated as a vestige of Case expression since (53), stated on semantic predicates, does not crucially require the presence of an object.

R&R (1993:675-681) contrast the Principle B effects that derive from (53) with the Principle A effects that apply to syntactic predicates, which are defined in a way that matches the domain for BT Principle A.

58) The *syntactic arguments* of P are the projections assigned theta-role or Case by P.

59) *Esther* expects *herself* to win..

In (59), *herself* forms a syntactic predicate with its antecedent because *herself* is assigned Accusative Case by *expect* on the Exceptional Case-marking analysis (which we will not review here), even though *Esther* and *herself* are not semantic coarguments. The [+REFL] property of pronoun-*self* is adequate to satisfy (52).

There are still pronoun obviation effects handled by BT Principle B that are not handled by (53), however, and these receive a different treatment.

60a) *Esther* expects *herself*/\**her* to win

b) *Sam* seems to *himself*/\**him* to be smart.

Since *Esther* and *her*, on the one hand, and *Sam* and *him*, on the other, are not coarguments, (53) does not rule them out. R&R propose that these cases fall under the Chain Condition.

61) Chain Condition: A maximal A-chain ( $a_1, \dots, a_n$ ) contains exactly one link -  $a_1$  - that is both [+R] and Case-marked.

The marking [+R] means that a nominal can be independently referential, whereas if it is [-R], then it must be part of a chain (see 4.4, 5.2 and fn.X32 on classification as [-R]). In English ECM and raising environments like (60a,b), pronoun-*self* is treated as [-R, +REFL], so it can reflexivize the syntactic predicate *expect* while being in a chain with *Esther*. Since *her* is not part of the semantic predicate *expect*, however, Principle B does not apply to it, but here the Chain Condition does the work; *her* cannot participate in a chain with *Esther* because simple pronouns are [+R]. Similarly in (60b), Principle B does not apply to *her* and instead (61) blocks chain formation, but it is not obvious how *herself* can satisfy its [+REFL] feature, since *seem* has no subject theta-role.

Forms like Dutch *zich*, insofar as they appear with inherently reflexive predicates, are now captured by the fact that *zich* is both [-R] (not referential) and [-REFL]. In such cases, the verb is lexically reflexive-marked by a null [+REFL] and the [-R] feature of *zich* permits it to form a chain with the subject while being available to absorb Accusative Case.

62) *Hij* heeft *zich*/\**zichzelf* geschaamd  
he has ZICH/ZICH-ZELF felt.ashamed  
“He was ashamed”

In languages like French, *se* is also [-REFL, -R], but *se* is used productively to form reflexive readings for transitive verbs, and so it is necessary to assume that a more generally applied null reflexive affix is available in French.

One of the enduring contributions of this approach, for those who think it is on the right track, is that it seems better adapted to address those languages where reflexivity is a verbal affix (e.g., French *se* is so treated, blurring the line between clitics and affixes), since it is the predicate that is marked and not an argument of the predicate, as in English. Additional machinery to account for inherent reflexivity appears to be necessary in any approach (see 5.3).

The main work of the Chain Condition, which departs from GB era assumptions in that it permits chains with more than one theta-role, is to rule out pronouns in (60a,b); Principle C effects are redundantly handled by Rule I anyway, and (53) rules out all the coargument cases redundantly (see Safir, 1994a:19-21). The Chain Condition is then taken to predict (a) the contrasts between [+REFL, +R] elements and [-REFL, +R] elements in contexts like (60), and (b) the differential effects in acquisition experiments that, according to R&R, distinguish between pronouns obviated by the Chain Condition and those obviated by (53) (as in cases where the distribution of *zich* and *zichzelf* overlap). However, this theory must also introduce the [-R] feature to A-traces so that they can participate in chain locality, which, if traces are really copies, is a very unnatural move. We shall return briefly to contrasts between [+/-REFL] anaphors in 5.2. Finally, the Chain Condition faces problems similar to those faced by BT whenever the domain of anaphora does not match the domain of A-movement (e.g., subjects can bind possessor anaphors in Scandinavian, but productive possessor raising to subject is not

possible).

What the predication-based approach insures for future work, however, is that coargument relations must play a distinct role from broader locality in any adequate account of anaphoric effects. This has consequences for both the typology of anaphors and the typology of anaphoric patterns, depending on whether a given pattern relies on argument anaphors, affixal markers, or other forms that evoke distinctions between coarguments, on the one hand, and other broader local coconstruals, on the other.

#### 4.2 Competition-based theories

Competition-based theories of anaphora take the complementarities in the distributions of pronouns and anaphors and/or those in the distribution of dependent forms and names to be the result of competitions, either between forms for bound interpretations, between derivations, or between levels of grammar. Unlike BT, which assumes that the domains of Principles A and B just *happen* to be the same, these theories see Principle B effects as the result of a lost competition. Potential counterexamples to such theories arise where forms are not in complementary distribution, which we briefly return to, with the discussion of 3.2-3 in mind.

Theories that treat forms as the competitors typically assume that a ‘less anaphoric’ form cannot be coconstrued with the antecedent if a ‘more anaphoric’ form is available. Theories of this kind must (a) determine which forms are available to enter competition to be dependent on a given antecedent, (b) provide a ranking of some sort that at least values syntactic anaphors over pronouns for the dependent reading, and (c) systematically determine the outcome of a competition in semantic, syntactic and/or morphological terms.

Reinhart’s Rule I could be thought of as the first principle of this kind, insofar as pronouns and anaphors outcompete names/descriptions in bound reading contexts, with the determination that names are not to be coconstrued with the antecedent when a pronoun is available. With respect to local anaphora, Reinhart’s principle made no prediction, since Reinhart assumes that both pronouns and anaphors could be bound as variables (see Reinhart and Grodzinsky, 1993:75fn.3) - that is why R&R addresses local anaphora with their predicate and chain theory.

A number of linguists have explored competition approaches to address locality effects (see, for example, Bouchard, 1984, Levinson 1987, 1991, Hellan, 1988, Pica, 1986, Burzio, 1991, 1996, Richards, 1997, Williams, 2003 and Safir, 2004a, amongst others) and I reproduce here a few of arguments that have been made in support of such an approach. Burzio (1989), the first explicit theory of this kind, points out that if something like Principle A limits the availability of syntactic anaphors, Principle B follows as the elsewhere case, such that pronouns are excluded where syntactic anaphors are possible.

63a) *Parish* praised *himself*/\**him*

b) *Thora* thinks that *she*/\**herself* is smart.

42a) Vi fortalte *Jon* om *ham selv*/\**ham*/\**seg*/\**seg selv*.

“We told *John* about *himself*.”

b) *Jon* fortalte meg om *\*ham selv*/\**ham*/\**seg/seg selv*.

“*Jon* told me about *himself*.”

Hellan (1988) argues that *selv*-forms outcompete *seg* and simple pronouns. For (42), repeated here, the both *seg* and *seg selv* must have a local subject antecedent, but *selv* forms always outcompete *seg* for productive coargument reflexive readings, so (42b) employs *seg selv*. Since

*seg* and *seg selv* are subject-oriented, they cannot be anteceded by *Jon* in (42a). This leaves pronoun-*selv* as the winner in competition with the simple pronoun for binding by the local non-subject antecedent *Jon*. *Seg* can, among other contexts, be a long-distance anaphor across reaching beyond more local infinitival subject antecedents, but anywhere *seg*, *seg selv* or *ham selv* cannot appear, a pronoun is possible.

Moreover, if Principle B effects arise from lost competitions, then it is predicted that pronouns can be interpreted as reflexive in a language that has a lexical gap for dedicated syntactic anaphors altogether. Levinson (1987) points out that this is arguably the case for Old English (64).

- 64) *Hi gecyston hi.*  
3ppl kissed 3ppl  
“They kissed them/*themselves/each other*”

Burzio points out further that in languages where the anaphor is restricted to 3<sup>rd</sup> person, 1<sup>st</sup> and 2<sup>nd</sup> person pronouns express the reflexive reading, in contravention to BT Principle B, as in French (65a) and Norwegian (65b).<sup>23</sup>

- 65a) *Je me/\*se vois.*  
I me see  
“I see myself”  
b) *Jeg skammer meg/\*seg*  
I shame me/SIG  
“I am ashamed”

Thus a gap in the paradigm for reflexive forms for 1<sup>st</sup> and 2<sup>nd</sup> person is predicted to result in what would be violations of Principle B.

Those determined to defend Principle B could assume that 1<sup>st</sup> and 2<sup>nd</sup> person object pronouns in these languages are homonyms or syncretisms with anaphors, and that the same holds on a grander scale for Old English, but such a position fares poorly if examined over a range of cases. For example, the Danish subject-oriented 3<sup>rd</sup> person local possessive anaphor *sin/sine*, which agrees with the possessum, is in complementary distribution with a singular pronoun, as predicted for both BT and competition theories where the possessor is in the same domain as its antecedent.

- 66a) *John laeste sin/\*hans artikel.*  
“John read his article.”  
b) *John og Mary laeste \*sin/deres artikler*  
“John and Mary read their paper.”

However, Pica (1984) notes that Danish *sin/sine* cannot have a plural antecedent (though it’s Norwegian counterpart can). In this context, the 3<sup>rd</sup> person plural pronoun, which does not normally have to be bound at all, must be used for the local anaphoric interpretation. Competition theory predicts that the pronoun is optimal in the absence of a plural form. Note, however, that cross-classification of the possessive as an anaphor in a non-competitive theory is not sufficient; Danish plural possessive pronouns would *also have to be stipulated not to be locally anti-subject oriented*, especially in the absence of a hoisting analysis (see Safir, 2004a:72).

This latter point dovetails with another argument made by competition theorists, namely, that anti-subject orientation appears to be found only in languages that have subject-oriented anaphors. Thus, as Safir (2004a:85) points out, if subject orientation is required in a given



language, as it is for the 3<sup>rd</sup> person SIG/SIN forms in Danish and Norwegian, the anti-subject-orientation of pronouns is predictable, as in the case of the pronouns in compound anaphors. Danish *sig selv* forms are subject-oriented, so less dependent pronoun-*selv* forms, which are also necessarily local,<sup>24</sup> are correctly predicted to be anti-subject-oriented. Anti-subject-oriented forms may turn out to be all and only those potentially bound forms that have lost to subject-oriented competitors.<sup>25</sup>

There several sorts of theories that employ a competitive principle evidenced as a choice of form. Levinson (1987, 1991) and Huang (2000, chapter 4) argue that the competitive principle involved reduces to Gricean implicatures, Burzio (1989, 1991) appeals to an economy principle of morphology, and Safir (2004a,b) argues for a category of competitive algorithms related to interpretation at the interfaces of which the this competitive principle is one. We consider each of these briefly in turn.

Levinson (1987) argues that the competition effect can be reduced to Gricean implicatures, on the assumption that if one meant to express local coconstrual, one would have used the required local form for it (assuming a version of Principle A for local anaphors), not the form that can be used non-locally as well (an appeal to the Maxim of Quantity of Grice's 1989:26, i.e., make your contribution to conversation as informative and only as informative, as is required), unless one did not intend the locally bound reading.<sup>26</sup> Y. Huang's (2000; chapter 4) version of the Gricean account begins with the assumption that the Principle B effect arises from a disjoint reference presumption for the arguments of a predicate (which is also an alternative proposed in Levinson, 1991), originating as a usage preference, as in Farmer and Harnish (1987), or even from world knowledge, 'due largely to the way the world stereotypically is' (Y. Huang, 2000:216) (see note 40). Principle A effects arise from overcoming the disjoint reference presumption by enforcing the most informative interpretation (which is the most specific one - an anaphor has only one possible antecedent). The use of the morphologically least specified element available falls under Huang's minimal-effort-inclined 'I-implication'. The maxim of quantity 'Q-implicates' that if the most informative form is not used, then the most specific interpretation was not intended, i.e., if a pronoun is used where an anaphor could have been, or when a name is used where a pronoun could have been, then coreference was not intended. He also suggests that there are distinctions between anaphors on the referentiality scale: *gap* >> *self* >> *self self* >> *pronoun-self*.<sup>27</sup> The self-directed predicates (see note 40), like *dress* or *wash*, use the most economical form (nullity) because less morphological effort is needed for predicates that favor the most specific reading (e.g., predicates like *John dressed*, as opposed to predicates he regards as other-directed, e.g., *John praised \*(himself)*).

Several points of concern arise for theories of this kind. First, the pragmatic principles do not distinguish bound from coreferent readings without referring to syntax. Even we add that a bound interpretation outranks a coreferent one, Huang would predict obviation cases like '*His* mother never criticizes *John*', because, without reference to c-command, *his* should be disjoint from *John* by Q-implication, contrary to fact because '*Everyone's* mother loves *him*' permits binding. Moreover, Huang never fully addresses the syntactic limitations on the distribution of non-coargument anaphors, such as the ECM contexts in (35), or for any of the bounded, but extended, binding domains in (39). For forms that can be bound across infinitive subjects for example, like *síg* in Icelandic or Hindi *apnaa*, some syntactic locality condition has to be stated, and so the distribution of these forms cannot be derived from the use of an anaphor to overcome unmarked predicate disjunction.

Burzio's (1989, 1991) competition account is formulated in terms of economy and does not depend on pragmatic maxims.

67) Morphological Economy: A bound NP must be maximally underspecified.

In keeping with the idea that anaphors are maximally underspecified elements (an assumption critiqued in 5.1), Burzio's principle insures that a pronoun will not be possible where an anaphor is permitted, and if semantic content other than features constitutes further specification, then names are more specified than pronouns. The more underspecified an anaphor is, the less discriminate it is with respect to what can antecede it, such that it defeats pronouns in more contexts. Thus the anaphor cognates *sig* (Danish), *zich* (Dutch), *sebjā* (Russian) can all be anteceded by singular 3<sup>rd</sup> person antecedents, but *sig* cannot be anteceded by plurals or non-3<sup>rd</sup> person, while *zich* can be anteceded by singulars or plurals, but not non-3<sup>rd</sup> person, and *sebjā* can be anteceded by any person or number. Thus *sebjā* defeats independent pronouns of all persons, *zich* defeats all 3<sup>rd</sup> person independent pronouns, and Danish *sig* defeats only 3<sup>rd</sup> person singular independent pronouns. The underspecification is consistent with as Burzio's formulation of Anaphor Agreement.

68) Anaphor Agreement: The morphological form of a dependent cannot have an agreement feature that conflicts with its antecedent.

Burzio's reliance on the notion that anaphors are featureless and participate in "pseudo-agreement" is too strong. After all, English reciprocals require local antecedents (apart from picture nominals), but they are neither featureless, nor is their lexical content completely accidental (see 5.3). Burzio (1991) moved away from (67) because anaphors like pronoun-SELF in English permit SELF to be inflected for number, so he later amended (67) to be sensitive to 'Referential economy', on the assumption that SELF-forms are 'referentially' weak by comparison with pronouns. This weakened the elegance of the theory in ways that other such hierarchies inherit. However, Burzio did not address the difference between bound and coreferent readings at all, and this limits the extension of his theory to Principle C effects, for example.

Safir's (2004a) offers a more comprehensive competitive approach which treats the core phenomenon as a competition of forms to represent an interpretation in a specific syntactic context. Like Burzio (1989) and Levinson (1987), he assumes a form of Principle A, like Y. Huang (2000), he assumes a ranking of forms (69) that extends to anaphors as well, but he adds the syntactic competitive principle in (70), from which he derives the effects of Principles B and C by obviation resulting from lost competition.

69) Most Dependent Scale: anaphoric.pronoun-SELF>>pronoun-SELF>>  
anaphoric.pronoun>>independent pronoun>>r-expression

70) Form-to-Interpretation Principle (simplified)

If x c-commands y and z is not the most dependent form available in position y with respect to x, then y cannot be directly dependent on x.

In its details, the competition pits numerations differing only by choice of dependent form to represent a particular dependent reading, e.g., *The boys love them* does not support the identity-dependent reading because replacing *them* with *themselves* will also permit a successful derivation (on global competitions of this kind see below). As to the ranking in (69), 'pronoun' is a form consisting only of features (no semantically identifiable root) and a pronoun is independent if it can occur in any context without an antecedent. Scandinavian SIG is an *anaphoric pronoun* because it meets the description of a pronoun and is never independent. On

this account, compounds containing a relational anaphoric stem (e. g, SELF or some body part, as discussed in 5.1) are more dependent than forms without them. Forms containing anaphoric pronouns are more dependent than those that have potentially independent pronouns. Finally potentially independent pronouns are more dependent than r-expressions. Terms more dependent than ‘independent pronoun’ must have a local antecedent (=Principle A).

The assumption that x-SELF forms are more dependent than SIG forms permits the competitive approach to derive the behavior of anti-local anaphors, such as Norwegian *seg*, which must be bound, but cannot be locally bound (unless the verb is inherently reflexive). When a local anaphor competes against another broader bounded anaphor, the broader-bounded anaphor cannot be used in the more local domain (see Richards, 1997 and Safir, 2004a for arguments of this kind). Rather than stating an anti-locality restriction on the *seg*, for example, the competition theory predicts that *seg* will not be used where a more dependent (x-SELF) forms are available. Conversely, for inherent reflexives, the x-SELF forms are independently blocked (see 5.2), and so once again, the SIG form fills in as the next most dependent form.

Complementarity is only required (in the form of obviated coconstrual) when the antecedent c-commands, so where the antecedent cannot be a binder, as in ‘*His* mother never criticizes *John*’, pronouns are not syntactically required to be in complementary distribution with names. The availability of a form for competition is determined by its specification in the lexicon, e.g., its  $\phi$ -features (determining if it can agree), designation as anaphor or pronoun (determining whether it must be locally bound), presence of a non-pronominal stem (determining its place on the hierarchy of anaphors), and whether it is subject to raising that causes subject orientation (it is unclear what determines this).

It is not always fully appreciated that competition plays a prominent role in most post-BT theories. Reuland (2001a), a theory primarily based on predication relations and Agree, suggests that there is a hierarchical processing advantage to establishing coconstrued readings by one method as opposed to another, such that predication is the most efficient way, binding is less efficient, and what we have called ‘mere coreference’ is least efficient (see also Reinhart, 2006). These approaches, in the tradition of Reinhart (1983) and Grodzinsky and Reinhart (1993), thus rely on competitions between components for the representation of coconstruals to induce obviation (determining somehow, in ways never fully spelled out, whether or not coconstruals represented in different components are distinguishable or not). By comparison with CAM approaches or Safir’s approach, which require global comparisons within a component, Reuland (2001b: 352-4) requires a supraglobal comparison, not just of possible derivations, but of connections made in different components to specifically evaluate anaphoric relations. The latter issue is addressed in Reinhart (2006), where more explicit assumptions about ‘reference set computation’ are explored, and a program for research into the cost of such computations is outlined.

Hornstein (2001, 2007) argues that it is not components or morphological forms but syntactic derivations that compete. Safir’s FTIP also requires comparisons of derivations, but the competing derivations are limited to those based on the numeration and interpretation at LF, where only a more dependent form can be substituted in the numeration and re-computed to determine whether or not a more dependent form than the given one was available. If the more dependent form that is substituted into the LF numeration permits a convergent derivation, then the thematic position of the form in the given sentence is obviated. Hornstein (2007), revising his earlier copy-covering pronoun-insertion analysis (Hornstein, 2001:170-172, 178), argues that

pronouns and reflexives have no lexical features, so the numeration that initiates a derivation does not contain them.<sup>28</sup> A derivation on that numeration that inserts a pronoun is independently determined as less valued than one introducing a reflexive because the latter is derived by movement, thus the competition is not between numerations, but within the numeration. Apart from technical details that this approach must address (e.g., the copy must be suppressed, the morphology of anaphors is not arbitrary, etc., see Safir, 2008 for further issues), the notion that movement is more economical is rejected in Chomsky (2004) who proposes that the existence of movement is a necessary consequence of Merge if Merge applies to a term already in the derivation (internal merge); there is no intrinsic economic contrast between external and internal merge. Unless Chomsky's proposal is rejected, the economy argument has to be recast.

All of these approaches, however, assume a competition for the most efficient formation of an anaphoric relation, and are not weighted against other requirements of a derivation (i.e., only the success of anaphora is measured). Safir's algorithm is the most syntactically explicit, but the conditions governing the competition do not follow from the general design of the grammar, a result the Reinhart/Reuland approach and the CAM approach aim to achieve, whatever their shortcomings.<sup>29</sup> However, all of these theories appeal to competition based on global (or supra-global) comparisons at least in part, especially for obviation, even if predication, movement or agreement are the featured mechanisms. In this respect, none are fully consistent with the general minimalist strategy of Chomsky (1995:227-8), which rejects global comparison as too powerful a theoretical device.

### 4.3 Locality in movement-as-coconstrual theories

CAM theories begin from the intuition that the distribution of anaphora can be reduced to independently necessary conditions on movement, as discussed in 2.3. The idea that A-traces are anaphors like reflexives and reciprocals dates from BT Principle A, but CAM theories reverse priority to propose that whatever enforces this locality relation on movement (e.g., phase theory from Chomsky, 2000, 2001) makes Principle A unnecessary.

The idea that movement and coconstrual are generated by the same device begins as early as Lees and Klima (1963). The CAM approach was revived in Hornstein (1999) wherein it is proposed that obligatory control can be derived by movement if the Theta Theorem is abandoned, that is, if movement from one theta-position into another theta-position is permitted, with the result that the moved constituent bears two theta roles.

71a) [tried [[Thomas] to climb the hill]]

b) [*Thomas* [tried [[*Thomas*] to climb the hill]]]

Even the mechanism of movement in search of Case, or some successor idea, can be employed to motivate the movement, leaving a theory of copy pronunciation to eliminate the lower copy, just as would be expected in a raising construction, except that, for raising predicates, no second theta-role is acquired by the moved DP. Hornstein's account of obligatory control remains controversial, as discussed in chapter 15b of the *Cambridge Handbook of Comparative Syntax*, but whatever its prospects, his extension of the same analysis to derive Principle A is primarily what we are concerned with here.

Hornstein, unlike Kayne, assumes that the copy left by movement is spelled out as an anaphor in local contexts. This also represents a change from an indistinctness relation to a dependency relation, as discussed earlier, but apart from these issues, and movement from one theta-position into another, which the control analysis already proposes, the theory does reduce

the distribution of reflexives to contexts where this sort of derivation can apply. The appearance of the reflexive form is a spellout required to realize the Case of the lower copy, and this is a departure from Hornstein's (1999) PRO analysis, where PRO is assumed to originate in a Caseless position.

72a) praised Maury[+Case, + $\Theta$ ]

b) *Maury*[+Nom, + $\Theta$ 1] praised *Maury*[+ACC, + $\Theta$ 2]

c) *Maury* praised *himself*

Hornstein (2007) suggests that Principle B is derived by derivational competition (see 5.2), on the assumption that pronouns cannot appear where a movement derivation is possible, and a movement derivation will result in reflexive morphology as the spellout of the lowest Cased copy. One problem with this account is that local English reflexives can receive strict readings in certain VP ellipsis contexts (see, for example, Hestvik, 1995, Kennedy and Lidz, 2001, Safir, 2004b:30), but PRO requires a sloppy reading.<sup>30</sup>

73a) Marcia expected herself to be more successful than Alice did

b) Marcia expected to be more successful than Alice did.

74a) Bush considers himself above the law, but we don't.

b) Legislators have been known to pay themselves more liberally than most voters would.

c) Attorney Shaw had to represent himself, since no other competent lawyer was willing

to.

While (73a) allows a reading where Alice did not expect Marcia to be so successful, Alice's expectations of success in (73b) are uniquely reflexive.<sup>31</sup> The coargument-bound reflexives in (74a-c) all support strict readings. This strikes at the heart of the parallel between the CAM PRO analysis and the one for morphological anaphors.

It is also notable that CAM approaches cannot derive the distribution of reciprocals the same way as reflexives, since reciprocal morphology carries with it meaning that is not found in its antecedent. Where reflexives are anteceded by reciprocals, a single movement derivation would have to leave different morphological residues with different meanings.

75) *The boys* expect *each other* to trust *themselves*.

Hornstein (2000:187) treats *each other* as an adverbial remnant of movement (see also Kayne, 2002 as in 2.3), but it is then unclear why such remnants cannot be left by wh-movement (e.g., \**Which men did Mary see [which men [each other]]*).

These problems for the CAM theory of anaphors as residues are not all that arise (see Safir, 2003, 2008, for further critique), but even those mentioned here seem to seriously cloud the prospects for this approach.

#### 4.4 Agreement-based theories

In Chomsky (2000), the Agree relation is introduced as a relation between a probe (normally a syntactic head) and a goal (normally a DP), such that the head values its features by association with the goal. The central intuition of Agree-based theories of anaphora is that the Agree relation can effect coconstrual and that the locality relation required by Principle A can therefore reduce to the locality restrictions on Agree, namely, phases, the descendants of barriers (Chomsky, 1986b). Since the antecedent is not normally a head, however, the probe must somehow facilitate or establish coconstrual between the antecedent and the goal.

Part of the reason for introducing Agree is to account for instances where movement does not appear to occur, but locality restrictions still hold on agreement relations (see Chomsky

2000:125, 2001:16, 2004:116). The Agree relation is modeled as a computationally restricted search into the complement of a head, such that locality will be determined by more general limitations on efficient computation. In practice, the locality boundaries of searches (which block Agree relations) are expressed as phases. The phases are taken to be CP and vP, where ‘v’ is the head that, for all transitive and unergative verbs, assigns external argument theta-roles in their SPEC (e.g., the V *hit* assigns a patient theta-role to its object and then V raises to v where the external argument of *hit* is assigned to the Spec-vP). The edge of a phase is material that is merged to [v XP] or [C XP] (as well as v and C, respectively). Movement to the phase edge permits edge material to avoid immediate spell-out and interpretation, which occurs for the complement of v and C as soon as a new head is merged above the edge of the phase. The inability of a head in one phase to look into a closed phase is called the Phase Impenetrability Condition (PIC) (see chapter 17 of the *Cambridge Handbook of Comparative Syntax*).

Reuland (2001a, 2005a,b) is the first proposal to appeal to properties of Agree to characterize anaphoric relations and, Reuland argues, to use it to derive Principle A from general economy conditions and conditions on how structures are interpreted. The account of Reuland (2005a) is designed essentially as follows: When two arguments of a predicate are the same in the relation  $\lambda x (x \text{ Pred } x)$ , the two arguments become indistinguishable and reduce to a one place predicate,  $\lambda x (x \text{ Pred})$  (as is possible for verbs like *wash*, given a rule of thematic merger, see 5.3, but not *kill*), if they are too close to one another (see also Lidz, 2001a,b,c). If a probing head can connect the two variables of a predicate within a phase, the reduction cannot be stopped, and results in ill-formedness if the predicate requires more than one argument. Thus certain variables have to be ‘protected’ from coargument binding within the phase to remain distinct, but must still form a relation via a chain to effect bound anaphora. The distinctness of variables is protected by embedding anaphors inside predicate shells, e.g., the *zich* of *zichzelf* is protected by the *zelf* portion, which, as a relational predicate, provides the status of a separate argument structure (see Jayaseelan, 1998, for the related idea that pronouns in complex anaphors are protected from Principle B). This correctly predicts that, within a phase, *zich* without *zelf* can be an argument anaphor if it is embedded in a PP or a small clause subject. Thus the local distribution of complex anaphors is a consequence of the protection mechanism, not BT Principle A and not R&R’s (52). Since only forms that have incomplete feature specifications can enter into chains (essentially the [+/-R] distinction), pronouns will not be able to form chains on this account, although they could be logically bound, were it not for obviation where a chain-binding derivation is available.

At its best, Reuland’s agreement-based theory derives Principles A and B from the assumption of variable indistinctness, the argument structure of predicates, the protection effect when chain-susceptible elements are embedded in relational structures, the processing efficiency hierarchy for forming anaphoric relations, and the assumption that only elements with incomplete feature complexes can agree in chains (in place of any primitive anaphor/pronoun distinction).

Reuland (2001a) does, however, rely on rich assumptions about chains (three kinds are appealed to) in order to model the appropriate effects, but it is not clear that chains of any sort have independently motivated status in minimalism. The pronoun/anaphor distinction that captures Principle B effects relies on an assumption about the context-dependency of number features (see Reuland, 2001a:464-5, 468), a nonstandard assumption at best, and the role of covert [+SELF] morphemes (as protectors) continues to play a role, even for non-coarguments,

e.g., ECM complement subjects, where protection should be unnecessary.<sup>32</sup> Reuland (2005a) gives a more schematic presentation where the role of chains is diminished, but whether the translation of Agree into dependency relations will capture the right interpretations (such that anaphors can permit strict and sloppy readings for examples like (2b) or (19)) is not established. If Principle A can truly be derived, Agree-based theories have a leg up on any theory that must stipulate Principle A, including R&R, although the manner in which pronouns are disqualified from chains in this theory remains suspect, and with it the derivation of Principle B, which other competition theories do derive.<sup>33</sup>

Another Agree account, Kratzer (2009), proposes that the head that probes for Agree is to be interpreted as an operator that combines with its complement to form a property. That property is predicated of the specifier of the probe (the antecedent), thus permitting semantic binding to be read directly from syntactic probe-goal relations. Recall, however, that Agree was originally formulated as a relation between a probe head and a c-commanded phrase (a goal) that values the probe, as in cases where T probes the subject below it to effect subject-verb agreement. The latter is not an antecedent-anaphor agreement relation, however. The two relations are necessarily distinct for Icelandic cases like (76) (from Zaenen, Maling and Thráinsson, 1990:102) where T agrees with a vP internal Nominative, but antecedent-anaphor relations hold between a Dative subject and a Genitive anaphor.

76) Henni þykir broðr sinn/\*hennar leiðinlegar  
*she-DAT thinks brother.NOM SIN.GEN/her.GEN boring*  
 ‘She finds her brother boring.’

Thus there are two visible agreement relations, subject-verb and SIN with possessum, and neither effects anaphora (indeed, it appears anaphors never agree with verbs, see 5.1). For Agree to be translated into binding, the binder and the bindee must be connected by Agree, but either the probe is the Dative subject, not a head, or the probe mediates relations between its specifier and something in its complement. Davison (2001:54-55) has made the same argument on the basis of Hindi data.

Given our demonstration that the anaphoric relation cannot reliably piggyback on other Agree relations, a special class of anaphor-agreement inducing heads will need to be structurally represented in Kratzer’s theory to capture semantic binding and no morphological evidence for such heads currently exists (see also Safir, 2010, appendix A, for further discussion). Heintz (2008) overcomes this difficulty, however, arguing that whatever is merged at the apex of the tree involves ‘minimal search’, including phrasal nodes (compare Chomsky, 2004:113). Moreover, Heintz proposes to distinguish pronouns and reflexives by virtue of whether a non-categorial stem is directly merged with N or D. In the former case, N provides valued phi-features which subsequent merger of D can probe and be valued by, but if D is directly merged to a stem, then D will lack valued phi-features, which only Agree with a probing DP merged later. The (interesting) morphological details aside, it is curious that Heintz assumes all bound variable relations are formed by Agree. Heintz does not offer any account of how pronouns can be bound variables (e.g., ‘*Everyone* loves *his* mother’), and so it is not clear why whatever device achieves these relations cannot provide a bound relation in local contexts for a pronoun. Appeal to some sort of competitive account between Agree and this device, as in Reuland’s theory, is conceivable, but out of the spirit of Heintz’s approach. Unfortunately, this leaves no account of the obviative effect of Principle B at all.<sup>34</sup>

In the Agree-based approach of Hicks (2009), by contrast, it is assumed that Principle B

is derived as an economy effect ('featural economy'), whereby contexts where variable binding could have been induced by Agree cannot be induced by the mechanism for non-local bound pronouns. Hicks contends that the competition in question does not amount to a global comparison, but some of his nuanced assumptions about features that are assigned integers as values are anaphora-specific, and instances of featural economy that do not pertain to anaphora are not explored.

Other Agree-based proposals are likely to appear as long as Agree restricted by phases is the premier locality relation in minimalist theorizing and as long as there is hope of deriving Principle A (see for example, Rooryck and vanden Wyngaerd, to appear), but the conversion of Agree relations into interpretive relations, the derivation of Principle B effects by obviation, and the potential proliferation of Agree relations are challenges to regard carefully in the new work that will emerge.

#### **4.5 Where we are**

How should we evaluate future work in this area going forward? Certainly, there is no satisfactory return to the BT principles, all of which the accounts mentioned here have tried to derive from other principles or generalizations that are posited to be independently necessary. It seems likely that Principle C effects will be derived from lost competition with (component representations or derivations containing) a subclass of bound pronouns and that Principle B effects will largely reduce to lost competitions with (derivations containing) anaphors. Attempts to derive Principle A (and preserve derived obviation for Principle B effects) in CAM and Agree accounts remain attractive in principle, but a convincing account of the technical details, one that does not ultimately clutter central principles, remains elusive. As we shall see in section 5, the richness of the empirical patterns observed remains an ongoing challenge for every current theory.

All the approaches just described must assume a semantic interface that makes use of the syntax to predict (non)coconstrual, a pragmatic interface that produces expectations, at minimum, and, in some cases, a morphological interface can insert a form that supports the syntactically established (non)coconstrual. Future accounts will need to capture distinctions made in section 2 regarding how coconstrual relations come to be represented and interpreted, no matter what the approach. Moreover, it will be necessary to guard against appeals to interface conditions if they simply restate stipulations in the syntax in other accounts. It is possible that elements of all the theoretical strategies introduced here will play a role in the theory that ultimately accounts for the possible patterns of anaphora.

#### **5.0 Morphology, variation and interpretation**

The internal structure of anaphors and pronouns turns out to bear an important relation to the class locality relations they can enter into and the possible interpretations they can have. Beyond contrasts between locally free pronouns, on the one hand, and locally bound anaphors, on the other, different types of anaphors, distinguishable by their morphology and the semantic contributions of their lexical stems, can contrast with one another, even in the same language, both with respect to locality and interpretation (e.g., as illustrated for Norwegian). Moreover, many languages have several sets of pronouns, distinguished in their distribution on the basis of their morphology and antecedency. This section briefly explores the contribution of morphological factors to some of the theoretical questions raised by the varieties of locality and



interpretation. The theoretical question that arises is whether there are syntactically determined bounds to variation in this domain and whether the general principles proposed to account for anaphoric patterns will dissolve into morphologically driven provisos. In the best case, central principles will be universal and “the apparent linguistic diversity across languages can in fact be reduced to the respective lexical properties of the different linguistic entities” (Pica, 1991:133).

### 5.1 Pronouns vs. Anaphors

Burzio (1989) observes that if a syntactic anaphor is a form that must have a local antecedent, then Principle A is a tautology. Burzio suggests that what is crucial to anaphors is underspecification of features, either person, number, gender or Case, an idea embraced by Reinhart and Reuland (1991, 1993) and later Reuland and Reinhart (1995) for Case. The suggestion is that underspecified forms cannot refer, and so must have a closer connection to their antecedents, whereas pronouns with a full set of person, number and gender features (phi-features) and Case can refer independently, and thus can appear in a sentence without an antecedent. The Russian anaphor *sebya*, for example, is not distinguished for number, person or gender and accordingly can be anteceded by any sort of antecedent, but potentially independent pronouns in Russian are distinguished for phi-features.

There are several difficulties for underspecification based accounts, however. First of all, English anaphors are distinguished for person, number and gender on the pronouns that are associated with *-self*. Moreover, *-self* can itself be inflected for number (e.g., *themselves*, *yourselves*), and the paradigm of pronouns associated with *-self* in standard English is idiomatic (Genitive pronouns combine 1<sup>st</sup> and 2<sup>nd</sup> person, Accusative with 3<sup>rd</sup> person masculine singular), which suggests that the properties of the forms must in some respects be taken as a whole. Furthermore, proper names in English are unspecified for gender (e.g., ‘Marion Morrison’ is the birth name of the actor known as John Wayne), and they are obviously not anaphors (but see note 3). If we restrict the underspecification criterion for anaphors to forms that do not have other semantic content, then the fact that body part anaphors like Yoruba *ara rẹ̀ BODY-of-pronoun*, which can have the literal meaning when used non-anaphorically, becomes accidental, as it does for all ‘relational anaphors’ (see below), leaving no obvious retreat for the underspecification view. German 1<sup>st</sup> and 2<sup>nd</sup> person object pronouns are bound locally, but do not appear defective for Case in any obvious way (but see Reuland and Reinhart, 1995). Reuland (2001a) abandons the deficient Case account for a deficient number specification, but see note 32 for a critique. Finally, null arguments of tensed sentences that are interpreted as independent pronouns without sentence internal antecedents are common in the world’s languages, not just in heavily inflected null subject languages, but in languages without overt inflection, such as Chinese and Japanese.

It is generally true that strictly anaphoric forms can never be used for deixis, even for pronoun-*self* in English (excepting Hibernian English, where pronoun-*self* appears to act as a pronoun).

77) \*Look! It’s himself! (Accompanied, perhaps, but pointing gesture)

Many forms that are not anaphors are also inappropriate for deixis, such as unstressed pronouns and clitic pronouns when they are distinct from full forms in a given language, but it does appear that nearly all the forms that require local binding also fail the deixis test.

In short, there is no current theory that predicts that the class of locally bound things will have all and only the morphological properties that anaphoric forms can have, because neither

underspecification nor failure of deixis are sufficient conditions to identify an anaphor and only failure of deixis is a necessary one (but see Keenan, 2007, for semantic tests designed to empirically isolate anaphors).

Although GB-era syntax treated pronouns and anaphors as necessarily non-overlapping classes (to derive the distribution of PRO, an approach now abandoned), most assume now that some pronouns are anaphoric. Descriptively, pronouns are nominal forms that have no semantic root and have only feature content. Pronouns are independent if they do not require an antecedent sentence-internally, and are treated as anaphoric if they require a c-commanding antecedent. Thus forms like French *se* and Dutch *zich* are pronouns, but anaphoric insofar as they must be bound. The French verb-affixed clitic *le* ‘him’ or the tonic pronoun *lui* are independent pronouns. Moreover, pronoun paradigms often include anaphoric forms (e.g., the pattern *me/te/se* and *mon/ton/son* for French, where only *se* happens to be anaphoric, or *mich/dich/sich* for German). There are some languages that distinguish amongst pronoun classes for topicality vs. contrast, by emphasis or stress, by logophoricity or else they permit one class of pronouns to be bound as variables, but not others. We will not explore these differences between non-anaphoric pronoun classes here, but see Cardinaletti and Starke (1999), Déchaine and Wiltschko (2002) and Safir (2004a:185-190) for discussion of the relation of the internal structure of pronouns to their potential for deixis and bound variable interpretation.

Another distinction between pronouns and anaphors is that pronouns typically permit split antecedents (e.g. Bouchard, 1984), but anaphoric forms almost never do. This is very difficult to test for coargument antecedents since pragmatically plausible three argument verbs need to be employed, but the prediction can be tested for English possessive reciprocals as shown in (78). In Hindi (Davison, 2000), the tense-bounded anaphor *apni* in (79) can have Ram or Shyam as its antecedent (and plural antecedents), but not both..

78a)\**Alice* introduced **John** to *each other's* accountant(s).

b) *Charlotte* introduced **Emily** to *their* accountant.

79)\**raam-nee* **syaam-see** *apni* gaaRii-kii marammat kar-nee-koo kah-aa

Ram-ERG Shyam-with SELF vehicle-of repair do-INF-DAT say-PF

“Ram told Shyam to repair self’s vehicle.”

Apparent counterexamples to this claim seem to involve anaphors cross-classified as UD-forms (see 3.3).

A last distinction is that in many languages, such as Italian, anaphors cannot be partners for subject-verb agreement (Rizzi 1990, Woolford 1999), whereas pronouns (bound or no) can so participate.

80a) \*A loro interessano solo se stessi  
to them.Dat interest.3pl only themselves  
“They are interested only in themselves.”

b) A me interessano solo loro  
to me.Dat interest.3pl, only them.Nom  
“I am interested only in them.”

Some long distance anaphors can apparently appear in Nominative positions, but most of those cases seem to pass tests for UD-forms as discussed in 3.3, or else subject-verb agreement is absent. The phenomenon suggests some sort of obviated agreement, perhaps a matter that can be addressed by an Agree-based theory of anaphora (because it is too exactly what is not expected), but the questions surrounding it remain open.

## 5.2 Differences between types of anaphors

Once we agree on how pronoun behavior and anaphor behavior are to be distinguished, a matter that is not fully settled (e.g., see 3.3), we are still left with considerable variation amongst the forms that are classed as anaphoric or that require local anaphoric interpretation. This variation extends across a number of dimensions, including principally those below:

81a) Surface position of the anaphoric marker: These include predicate affixes that induce reflexive readings (prefixes to verb stems in Narrow Bantu), clitic forms that show some interpretive, syntactic or morphological independence from the predicates they attach to (as in Romance, where clitics can climb), independent forms that appear in argument positions (as in Germanic) and adjunct, typically adverbial forms (e.g., *he did it himself*). In some languages, markers can also occur in discontinuous combination, (e.g., as in French *Ils se voient l'un l'autre*, 'They see each other', where *l'un l'autre* appears to be an adjunct).

b) Morphological complexity of the anaphoric marker: Some anaphors are taken to be simple underived roots that do not inflect, as is frequently the case for affixal markers, but also for many argument markers (e.g., Scandinavian SIG). Other markers consist of decomposable parts, including more than one stem (e.g., Dutch *zich+zelf*), or a stem-affix analysis (e.g., Lubukusu AGR-(*b*)eene) or both (e.g., English pronoun-*selv(es)*).

c) Semantic atoms in the anaphoric marker: Some stems (semantic atoms) have stable meanings when external to an anaphor, and these meanings fall into very limited semantic categories that occur cross-linguistically, including body parts (e.g. Yoruba *ara* 'body'), OWN (Lubukusu (*b*)eene), or SAME (French *même*), most typically for reflexive readings, OTHER, ONE-ONE, and similar forms for reciprocals. Other languages have a stem that has no identifiable meaning, and others still have forms that qualify as pronouns.

d) Interpretive class of the anaphoric marker: There are many variations on anaphoric readings (e.g., reciprocal, reflexive, distributive/non-distributive, dual/plural), or non-anaphoric readings that cluster with anaphoric ones (see 5.4). Whether or not proxy readings (5.2) or *de se* readings (see note 21) or other aspects of point of view are permitted or implied also comes into play.<sup>35</sup>

e) Agreement on the marker: These include agreement with an antecedent, and/or with an external modified nominal (e.g., Norwegian *sin(e)*, a possessor that agrees in gender with its head noun), and internal agreement amongst parts of complex markers (difficult to tell from antecedent agreement with both internal parts, as in English *themselves*).

The main issues are whether or not the bounds of all this variation can be predicted, whether there are causal factors that determine whether any properties of (81a-e) vary together, and if values for (81a-e) play a role in predicting possible syntactic locality domains, possible UD-form or exempt anaphor distributions, and/or syntactic subject-orientation.

The most general approaches will either predict the morphological properties of forms bound anaphorically based on their syntactic configuration, or they will predict the syntactic configurations in which forms can be anaphoric on the basis of their internal morphological properties (or both). CAM theories, for example, should strive to predict the morphological properties of bound elements based on how the derivation has been constructed, whereas competition approaches should show that internal properties of morphological forms should predict the competitions they can enter into to support anaphoric readings; their distributions are the outcomes of those competitions. Safir proposes that the forms in question can be marked in

the lexicon as anaphoric (subject to Principle A effects), but all other properties of lexical items are not anaphora-specific (e.g., the size of the binding domain should depend on non-anaphoric properties). R&R's predication approach assumes that nominals are specified for features that matter for predicate and chain formation, and the distribution emerges from whether or not chains or predicates can be formed including the form with the relevant specifications (i.e. [+/-R, +/-SELF]). Heintz (2008) proposes that the internal structure of a form, whether the non-categorical root combines first with N or with D, determines susceptibility to Agree (and thus binding). However, all theories will seek to capture families of anaphors classified by internal properties that appear to act in a general way.

One internal property of anaphors that has been linked to syntactic distribution is (81b), noted by Faltz (1977) and treated by Pica (1987) as a firm correlation presumed to hold both crosslinguistically and language internally (in languages with more than one anaphor).

82) Complex (multimorphemic) anaphors are restricted to the most local domains, while anaphors bound at greater distance are always simplex.

For example, the Scandinavian anaphor SIG-type anaphors can be bound at a distance across infinitives, but the complex SIG-SELF forms cannot be. In theories like R&R, the locality of SIG-SELF would be reduced to the locality SELF-movement to form a reflexive predicate, for example. The bounded, but not very locally bounded, simplex forms are then hypothesized by Pica (1987) and others to be susceptible to long distance head movement (which, as pointed out in 3.2, is not attested overtly). There are, however, counterexamples to the generalization, as pointed out by Huang (2000:96), including complex anaphors that can be long distance bound and some that are only long distance bound, but see Safir (2004a:274fn.46) for discussion. Moreover, if Kayne (2000) is right, the *m/t/s* pronominal paradigms of Romance and Germanic are internally complex (e.g., French *me/te/se, moi/toi/soi*, etc.) so the generalization about simplex forms, insofar as it can be maintained at all, might be restated as involving forms without non-pronominal stems in their internal morphology.

For example, Safir (1996, 2004a) distinguishes between *relational anaphors*, those based on meaningful stems, and pronominal ones, and goes on to investigate whether the internal structure or the residual meaning of (often somewhat semantically bleached) stems helps to determine their interpretations and distributions, based on the competitions they enter into. Thus it appears that body part anaphors (e.g., pronoun-SELF/HEAD/FACE/BODY) are rarely used for reciprocal meaning unless there is no explicitly reciprocal form in the language, but anaphors based on OTHER are never reflexives.<sup>36</sup> Although Schladt (2000) provides a broad survey of the stems employed for reflexive anaphors, not enough empirical research has explored these questions (e.g., with respect to SAME and OWN-based anaphors). These issues are important insofar as they provide a testing ground for the ability of the different theories in section 4 to accommodate and/or predict patterns of lexicalization and distribution for both relational anaphors and pronominal ones.<sup>37</sup>

Recent literature summarized in Safir (2004a:112-114, 124-135) has puzzled over contrasts between the ability of different anaphor types to represent proxy readings.

83) At the wax museum opening, *Castro* expected *himself/PRO* to be dressed in a uniform. The pronoun-*self* form permits two interpretations, one where Castro-person expects Castro-person to be so dressed, and one where Castro-person expects Castro-statue to be so dressed, but PRO in place of pronoun-*self* only permits the person-person reading, not the person-statue reading. Thus, as Jackendoff (1992) was the first to point out, reflexive identity can hold

between non-coextensive denotations. The fact that the overt form in English is required for this interpretation does not permit us to test differences between anaphors in this respect, but Norwegian does, where the proxy relation is person-literary work instead of person-statue.

84a) Yeats leste seg selv på engelsk og så gjorde Hamsun det på norsk.

"Yeats read SIG-SELF in English and then Hamsun did in Norwegian."

b) Siden han visste at Le Carré var flerspråklig, bad Grisham Le Carré om ikke å lese seg på tysk.

"Knowing Le Carré was a polyglot, Grisham asked Le Carré not to read SIG in German." [SIG=Grisham's writing]

c) Le Carré synes at folk skulle lese ham kun på engelsk.

"Le Carré thinks that people should only read him in English."

Safir (2004a:132, 169) points out that Norwegian *seg* cannot support proxy interpretations locally, where *seg* is only possible for inherent reflexives, but *seg selv* supports the proxy reading where it is available. Where *seg selv* is not available (e.g., non-locally) and *seg* is, *seg* can support a proxy reading (84b). Finally, where *seg* is not available, a pronoun supports the proxy reading. Safir argues that SELF forms cannot be obligatorily indistinct from their antecedents in languages that have an alternative that can be indistinct, so Norwegian *-selv* forms are not available to represent necessarily indistinct interpretations (like (65b)). Where indistinctness is not required, *seg selv* wins the competition to represent this reading, but it is not an intrinsic property of *sig* that it cannot support a proxy reading, as (83b) shows. Thus the competitions that anaphors and pronouns enter into are determined by their internal properties, but their empirical distributions are determined by the competitions they win.<sup>38</sup>

Other instances of the syntax of anaphora reaching down into the morphology of anaphors must be omitted here for reasons of space (but see 4.3-4), but this is enough to illustrate that the agenda of any explanatory theory of anaphoric relations will be responsible for a theory of the morphological forms that effect those relations.

### 5.3 Reciprocal anaphora

The distribution of reciprocal readings is a topic too broad for discussion here, involving as it does a range of possible reciprocal readings (see Büring, 2005:203-220, for a formal semantic treatment and references) and a wide range of possible morphological expressions (see in particular Frajzyngier and Curl, 2000b, and Nedjalkov, 2007). On the other hand, reciprocals have not received the same attention in the syntax of generative grammar (as opposed to the semantics) that reflexives have and so explicit syntactic analyses are relatively few.

There have been decompositional analyses of the English reciprocal *each other*. Perhaps the best known is Heim, Lasnik and May (1991), which treated *each* as a quantifier (a 'range argument') which adjoins to the antecedent ('the distributor') and binds the relational argument place of *other* (which is adjoined to VP), i.e., each member of the set of the antecedent is other than each of the other members of that set when paired in the two place tricking relation.

85) [IP [DP[DP the boys ]<sub>j</sub> each]<sub>k</sub>] [IP t<sub>j</sub> [VP [DP t<sub>k</sub> other]<sub>l</sub>] [VP tricked t<sub>l</sub> ] ] ] ]

The clause-boundedness of quantifier-raising predicts the absence of long distance reciprocals, which is generally true. However successful the syntactic analysis was for *each other* (see Everaert, 2000, and Williams, 1991) it did not appear to generalize to reciprocals in other languages, either because different lexical stems are involved (e.g., in Lubukusu, *Agr-eene khu beene* 'Agr-own on/to/for own', as discussed in Safir and Sikuku, forthcoming), or a dedicated

reciprocal affix is monomorphemic and located on a predicate (such as the verb extension *-an-* in the Narrow Bantu languages) or realized in root reduplication (e.g., Amharic), or the marker that can be interpreted as reciprocal is polysemous, either affixal (e.g., French clitic *se*) or in argument position (Yoruba *ara rè* ‘body 3ps.pronoun’), or in some combination that permits disambiguation (e.g., French *se* and the adjunct *l’un l’autre* ‘the one the other’) (see, in particular, Nedjalkov, 2007: chapter 3).

BT predicts that reflexives and reciprocals would have the same domain, and though this is true for English in interesting cases, such as (86a), an ECM environment, it is not true for possessors like those in (86b) where reciprocals are possible and reflexives are not (see Everaert, 2000, for discussion).

86a) *The boys* expect *each other* to be honorable.

b) *The boys* read *each other’s/their/\*themselves* books.

From a competition theory perspective, the binding domain may apply to reflexives and reciprocals in the same way, but that domain would then have to include the possessor position, since possessor reciprocals have access to antecedents in the minimal clause that includes the possessum. The lack of a possessive form for *himself* would be treated as a gap in the local domain that is filled by a pronoun.<sup>39</sup>

With respect to affixal reciprocals, Reinhart and Siloni (2005) argue that the predicate-based theory of reflexivity can be extended to account for reciprocals, and contend further that there is covariation in the derivation of affixal reciprocals and reflexives in the languages that have both. They argue that, like affixal reflexives, affixal reciprocals (or inherent reciprocals without an affix, e.g., *the boys argued*) can be formed either in the lexicon or in the syntax by a rule that merges two thematic arguments of a predicate into one argument position. Their Lex-Syn parameter then requires that if affixal reflexives are formed uniquely in the lexicon in language L (i.e. thematic merger reduces transitive argument structures to intransitive ones), then affixal reciprocals are only formed in the lexicon (and vice-versa), but if the affixal reflexive is formed in the syntax, then affixal reciprocals must be too (and vice-versa). Dutch is a lexicon language (where *zich* is treated as a Case-absorbing clitic and there is no abstract SELF-affixation, contra R&R) as is English (e.g. *John washed*, where there is no overt affix), such that predicate-formation is uniquely in the lexicon, whereas they argue that predicate formation for reciprocals and reflexives is part of the syntactic component in languages like French and German.

The predictions made by this ambitious theory require careful comparative analyses. Chichewa and Kinande, for example, are Bantu languages which have both a reflexive marker and a reciprocal marker expressed in their verbal morphology. Mchombo (2006) argues that Narrow Bantu reciprocals are formed in the lexicon (e.g., they interact with derivational affixes and can form nominalizations) but reflexive markers are syntactic, an adverse prediction for Reinhart and Siloni, if true. Mutaka and Safir (2007) argue that Kinande morphology shows that inherent reflexives are not derived from transitive counterparts, but rather that transitive counterparts are fashioned from inherent reflexive lexical entries. Although these facts appear to compromise the Reinhart and Siloni approach in two ways, closer analysis is necessary to see if these challenges are fatal. From the theoretical perspective, however, thematic merger stipulated to apply to coarguments is a departure from minimalist practice, since application of the rule in the syntax is not subsumed under Merge or Agree.

The brief remarks in this section serve only to show that exploration of the syntax of

reciprocals holds the promise of informing future work on both the theory of locality in syntax and the theory of predicate argument structure.

#### 5.4 Polysemy

One class of issues that arises in many languages concerns the polysemous properties that some anaphoric markers bear. It is notable in these discussions that the markers that are most polysemous are affixal markers, not argument markers. While argument markers may be polysemous for reciprocal/reflexive and reflexive/emphatic or all three (e.g. Gungbe *pronoun-dé-Num*), polysemy for reflexive with passive, anti-causative, middle etc., does seem rare for argument reflexive markers but are widely attested for clitics or verbal affixes (see Heine, 2000, for a survey of African anaphoric markers). Discussions of how grammaticalization processes might tend to produce such patterns of polysemy, such as Heine's, suggest nominal origins for reflexives that phonologically reduce even as the range of functions they cover increases. Kemmer (1993) and Lichtenberk (2000), amongst others, have explored some suggestive semantic generalizations about typical clusters of polysemy.

Theories of emphatic reflexives, some of which depend on scalar implicatures or evoked alternatives, relate argument position reflexives to adverbial reflexives (e.g., 'John went to the store *himself*') reasoning as follows: if most predicates are *other-directed*, then adding an emphatic SELF marker (or some other stem) reverses the expectation of other-directedness, hence local reflexives are complex (see König and Siemund, 2001:60-62 and Gast, 2006, for further discussion and references - compare the disjoint reference presumption discussed in 4.2 and Reuland's account of resistance to indistinguishability in 4.4).<sup>40</sup> It has been argued that complex reflexives arise historically in this fashion, as grammaticalization of adverbial reflexives creates argument reflexives (e.g., Keenan, 2002, but see also van Gelderen, 2000a,b, and Rooryck and vanden Wyngaerd, to appear, section 5.2.3 for the history of English).

Within generative syntax, the polysemy of reflexively interpreted affixes is usually treated as originating in the way the predicate argument structure of predicates interacts with general properties of the syntax. Several attempts have been made to relate reflexive interpretations to unaccusativity (e.g., Marantz, 1984, Grimshaw, 1990), that is, reflexives are analyzed as structures where no thematic role is assigned to the subject and the apparent subject is moved from (or from within) object position. The affix itself (*se* in (87)) is analyzed as a marker indicating de-linking of the logical subject, or as an anaphor corresponding to the logical subject that frees up the syntactic subject position for *les filles* to move into it (see, e.g., Pesetsky, 1995, Sportiche, 1998).

- 87a) [*les filles*] *se* voient [*t*]  
 the.pl girls SE see.pres.3pl  
 "The girls see themselves/each other."
- b) [*un veston de laine*] *se* lave [*t*] facilement.  
 a jacket of wool SE wash easily  
 "A wool cardigan washes easily."
- c) [*la branche*] *s'* est cassé [*t*]  
 the branch SE is broken  
 "The branch broke."

Insofar as middles (87b), decausatives (87c) and passive structures (not shown) have been analyzed as unaccusative structures, the advantage of this approach is that polysemous markers

can be argued to arise naturally on the basis of the kinds of syntax that they have in common.

Other generativist approaches to polysemy rely more on lexical manipulation of argument structure and/or interpretation and keep the syntax of affixal reflexives unergative. Reinhart and Siloni (2004, 2005) argue at length that the unaccusative analysis for reflexives in languages like Dutch and French fails too many of the diagnostic tests for unaccusativity to be viable and instead propose the rule of thematic merger discussed in 5.3. Lidz (2001a:312) argues that some ‘reflexive’ affixes, such as the one he discusses in Kannada, are actually just markers indicating a “mismatch between the representation of the thematic relations in a sentence and the lexical-aspectual decomposition of the verb in that sentence.” He argues that different linking mismatches arise in reflexive and decausative sentences, but since both involve a mismatch of the thematic/lexical-aspectual mapping, the relevant affix appears. Steinbach (2002) also rejects the unaccusative analysis and combines linking rules in the lexicon with transitive syntax and the assumption that weak reflexives are only optionally interpreted as arguments (strong ones must be) to derive the polysemy of the German middle marker (reflexive, anticausative, middle) from semantic interpretation (drawing on Reinhart, 2002).

Rooryck and vanden Wyngaerd (to appear) return to the ergative analysis of inherent reflexivity by arguing that these verbs take a clauselike inalienable possessor complement (RP), containing a subject-like possessum and prepositional object complement possessor. Instances of dative subjects in German like (88a) are derived from the complement structure in (88b).

88a) Jan hat sich den Fuss verletzt [German]

Jan has REFL the.ACC foot hurt

“Jan hurt his foot”

b) \_\_\_\_ T [VP verletz [RP [RP [DP den Fuss] R [PP P [DP sich ]]] R [PP P [DP Jan ]]]]

Through a series of head incorporations, the R and P nodes do not surface morphologically, but they contribute to the ability of the unaccusative verb to assign Accusative Case to *den Fuss*, (based on the internal structure for these relational phrases proposed by den Dikken, 2006 and references cited there). *Jan* raises to Spec-T where it antecedes *sich*. By this means, the ergative analysis is preserved, accounting for the lack of volitional agentivity, even though verbs taking complements of this sort can still assign Accusative Case. Rooryck and vanden Wyngaerd then set out to counter the arguments proposed by Reinhart and Siloni against an ergative approach to reflexivity in French and Dutch, in particular, which extending the analysis to other constructions that employ the same marker. I set aside further discussion for reasons of space, but this is enough to indicate that the ergative reflexive analysis as an approach to polysemy remains in play.

## 5.5 Some open questions

The enormous variety of anaphoric forms, their distributions and their interpretations certainly remains a descriptive and theoretical challenge for future work. We now know a great deal about the varieties of anaphora, thanks to large scale comparative work by Faltz (1985), which is his pioneering 1977 dissertation, Genusiene (1987), Y. Huang (2000), Kemmer (1993) (on the polysemy of many anaphoric markers), many of the essays in Frajzyngier and Curl (2000a,b), Nedjalkov (2007) (an enormous compendium of work on reciprocals) and countless smaller studies reporting on anaphora in the world’s languages.

It is notable, however, that most of these works focus on classes of forms or classes of constructions and do not compare the full pattern of anaphora in one language with its full



pattern in another. For competition theories, this is a shortcoming, because forms with identical domain restrictions will have different overt distributions depending on what other forms compete with them within one language as opposed to another and close analysis of syntactic contrasts between languages will reveal non-anaphoric properties that influence anaphoric patterns. The detailed monographs that facilitate such comparison, such as those by Everaert (1986) on the anaphoric pattern in Dutch or Hellan (1988) for Norwegian are relatively rare. In this respect, future work on the morphological variety of anaphoric markers is more likely to make progress when a range of highly detailed works on particular languages permit rich cross-linguistic comparison.<sup>41</sup>

## **6.0 Directions for future research**

Minimalist approaches to syntax suggest that the theory of anaphora should be an epiphenomenon of one or a few syntax generating principles that interact with interface properties (perceptual-articulatory, conceptual-interpretive) to permit the class of human languages that are possible. The diversity of anaphoric patterns on the surface seems to require many distinctions within our knowledge of grammar, but every ancillary device to create a richer classification takes us further from the minimalist ideal, unless there is independent evidence that the device in question can be attributed to an independently necessary property of the syntax or the interfaces. The ‘narrow syntax’ itself seems to contain Merge and Agree constrained by properties of the lexicon and competitive principles that are couched in the language of economy or optimal computation. All of the successors to BT have appealed to some or all of these devices, but whatever the right devices are, the best outcome in the long run would be for the theory of anaphora to disappear as an independent entity.

However, we must be wary of approaches that translate unsolved problems into minimalist terms and declare victory. The right theory must explain why coconstrual is sensitive to syntax at all, and so some form of coconstrual must be expressed in derivations or representations (e.g., turning indices into features with integers as values, as in Hicks, 2009, does not remove indices from the theory, except on a theory internal interpretation of inclusiveness). Agree theories look promising as accounts of why local anaphor binding is sensitive to c-command, but the right theory of coconstrual must explain how local Agree is interpreted as variable binding. No approach to obviation for principles B or C effects has escaped some version of a competition theory, typically appealing to global or supraglobal comparisons. Moreover, if it is true that bound variable pronouns are sensitive to scope, rather than c-command licensing, as argued here, then Principle C effects, which are c-command sensitive only, do not follow from the condition on variable binding. The theoretical works reviewed here have addressed many of these issues, though many questions remain open. If the recent range of book-length treatments of the anaphora questions are any indication (e.g., Heinat, 2008, Hicks, 2009, Reuland, 2011 and Rooryck and Wyngaerd, to appear), we can be certain this will remain an active area of research for a long time to come.

## **Notes**

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1. This essay only addresses anaphora between nominals, most typically involving nominals interpreted as entities, rather than events, propositions or states of affairs. Although spatial, modal and temporal anaphora deserve more attention from syntacticians, they are set aside here for reasons of space.

2. The notion ‘c-command’ as stated here is Reinhart’s (1976) version, a descendant of earlier notions (see Lasnik, 1981:1-36, for the history). Some definitions eliminate symmetric c-command (e.g., Kayne, 1974, who relates it to precedence) and some definitions are derivationally based (e.g., Epstein et. al., 1998). Others reject a pure structural statement in favor of prominence of thematic roles (e.g., Pollard and Sag, 1994, but see Safir, 2004a:140-145), but all theories assume if X c-commands Y, then X c-commands Z if Z is dominated by Y, which is crucial to the unbounded character of c-command.

3. As Lasnik (1981:149-167) has pointed out, there are languages (e.g., Thai) in which names can be quite generally c-commanded by a coconstrued name, and these constitute counterexamples to Principle C as stated. He points out, however, that even in these cases, the c-commander cannot be a coconstrued pronoun. For other languages where names appear to be bound, see Mortensen (2003) and Lee (2003).

4. Backwards anaphora is often regarded as degraded without an appropriate pragmatic context (e.g., Safir 2004b:53). Kayne (2002:150) cites literature that it is unacceptable in some languages.

5. The difference between A- vs. A’-binding was originally stated in terms of positions assigned theta-roles vs. positions not assigned theta-roles, respectively. With the expansion of functional structure, the distinction had to be restated (see Chomsky, 1995:64, who with Howard Lasnik introduces the notion ‘L-related’) in order to preserve the distinction between binding by predicate arguments vs. binding by elements that are not predicate arguments (e.g., and adjuncts, quantifiers), but the idea is that certain positions are defined as quantification or discourse-related, and others as Case or predicate related, and only binding from the latter sorts of positions is A-binding. Most of the discussion in this paper is about A-binding.

6. It is possible for some descriptions to act as locally A’-bound variables in relative clause resumption contexts, e.g., *Do you remember **that third-grader who**, even after all we did, we couldn’t imagine how **the little bastard** was ever going to pass?*, but as Lasnik points out, epithets, unlike pronouns, cannot be A-bound, e.g., *Every **third grader** wonders how **he/\*the little bastard** is going to pass*. See Kayne (2002:140) and Dubinsky and Hamilton (1998), however, for some interesting counterevidence. See also notes X3 and X13.

7. The literature on crossover effects is deep and wide and will not be explored here. See Safir (2004b) and Büring (2005) for references and a literature reviews as well as particular theories, but weak crossover effects continue to inspire new research.

8. Barker (2008) details a much wider range of violations of (9), including examples like i.-iii.,

where the quantifier takes extra-wide scope (but notice that (18) is not violated).

- i. The scope of *each book* has expanded on that of *its* predecessor.
- ii. When the game ended, the amount of wealth that *each person* had accrued was added to *their* overall score.
- iii. After unthreading *each screw*, but before removing *it*, make sure the boards will remain aligned, so you can replace *it* later.

9. Büring (2005:116) gets the strict reading from the assumption that independent pronouns (as opposed to names and descriptions) have indices, that the overt VP and elided VP “must be syntactically identical, *including indices*” (emphasis Büring), and the proviso that “No LF representation may contain both semantically bound and free occurrences of the same pronoun” (“No spurious indices”). The role of syntactic indices, which are interpreted as coreference, insures the strict reading is the only alternative to the sloppy one here. He later shows that neither syntactic indices nor the spurious indices proviso are needed if we adopt Rooth’s (1992) focus theory of ellipsis, in which the referential values of pronouns will have to match if the entailments of focus domains do - an approach that is most definitely *not* mere coreference (see also Fox, 2000, on parallelism). See Büring’s discussion of what the elimination of syntactic indices would mean for assignment functions (pp.135-137). More problematic for elimination of syntactic, as opposed to semantic, binding are cases like “*Only John* voted for *himself*” (Heim, 1993), which allow a strict/sloppy-like distinction where there is only one focus domain. Büring (p.141) suggests syntactic indices may still be needed to satisfy Principle A and provide for the strict reading. Safir (2004a:111) addresses a similar issue with *even* and concludes syntactic antecedence is crucial.

10. If *he* is assigned an index in the semantic or discourse representation, that is a separate matter that the syntax of these forms does not address (unless we follow the proposal Büring rejects for syntactic indices on pronouns, see note 9). Thus whether or not there are indices in semantics (see, e.g., Jacobsen, 1999, Pollard, 2005) is a question largely orthogonal to the one addressed here. Since the focus here is on syntax, accounts of discourse anaphora do not receive any serious attention here, but see Ariel (1990) for an influential study.

11. It is also not clear that the notion ‘numeration’ needs to be part of linguistic theory (see Safir 2010: 44), and if so, inclusiveness may not be definable in a useful way. Hicks (2009: chapter 4) proposes a special class of features to which integers corresponding to antecedent values are assigned, which appears only to smuggle indices into the feature system (a concern he considers, but does not, in my opinion, allay) in order to satisfy inclusiveness.

12. Both Kayne (2002) and Hornstein (2001) allow ‘sideways movement’ (see Bobaljik and Brown, 1997), which permits B, a subconstituent of A, to move (Merge) to C, where C is not a node dominated by or dominating A. Although Hornstein and Nunes (2004) claim advantages for parasitic gap and across-the-board structures, this increase in the options for movement allows for many more possible coconstructions, a proposal critiqued in Safir (2003, 2008).

13. For example, Aoun et. al. (2001) argue that a form of subextraction from what is superficially a resumptive epithet accounts for a differences between interpretations of epithet

resumptives embedded in islands and those that are not. See also Boeckx (2003). A variant of Kayne's approach is advocated in Zwart (2002).

14. It is usually assumed that reverse binding, where an anaphor is in a position that c-commands its antecedent, is impossible, but see Anagnostopoulou and Everaert (1995), for an account of some plausible cases. See also discussions of backwards control in chapter 15b of the *Cambridge Handbook of Generative Syntax*.

15. Reconstruction describes constructions where subparts of a displaced constituent behave as if they were still present in the position from which they were displaced, e.g., 'Which pictures of *his mother* did John say that *every boy* should be proud of?' Most speakers can answer 'The ones of her as a bride', which is a relational bound variable interpretation of *his* (the mothers vary) where *every boy* appears to have scope over *his*, even though *his* appears to be outside the scope of *every boy* after displacement, but not before. I avoid the rich literature surrounding reconstruction effects for reasons of space, but see Safir (2004b) and Sportiche (2006) for discussion and recent references.

16. See Hicks (2009: chapter 3) for extensive discussion of Principle A as an anywhere condition as opposed to its application uniquely at LF.

In the 1970's and 1980's, examples like i. and ii. were part of the pattern to be captured by binding domains, and attempts to distinguish elements contained in thematic subjects from thematic subjects themselves were attempted (for a summary, see Lasnik, 1981:1-36).

- i. *The men* said that pictures of *themselves* would be on sale
- ii. *The men* said that there would be pictures of *each other* on sale.
- iii. \**The men* said that *each other/themselves* were guilty

These examples also involve picture DPs, however, and are now not typically treated as core locality phenomena. See 3.3 for discussion.

17. Acquisition studies have made important contributions to the study of anaphora, but I have little to say about them for reasons of space. Issues surrounding the emergence of Principle B effects and the nature of obviation have been especially influential. See especially Thornton and Wexler (1999), Reinhart (2006) and Elbourne (2005), for references and discussion. For a recent account of how other psycholinguistic evidence bears on anaphora, see Burkhardt (2005).

18. Dalrymple (1993:39-40), suggests incorporating an even more elaborate listing of domains that adds subject-orientation within an LFG approach. See Safir (2004a:60) for discussion.

19. Postal (1974) was an early advocate of this view, which, in minimalist approaches, is interpreted as movement from complement Spec IP position to a Case-marked, but non-thematic position in (functional projections just above) the matrix VP (e.g., Lasnik and Saito, 1999).

20. In some languages, anaphors cross-classified as UD-forms can also be bound by 'subcommanding' antecedents. These are typically possessors of nominals c-commanding the UD-form and they are required to encode point of view (e.g., '*John's* letter says...*UD-form*', but not '*John's* car crushed *UD-form*'). These cases may fall together with non-commanding

antecedents that are logophorically conditioned, rather than a special class. See Y. Huang (2000:119-20) for animacy considerations and Huang and Liu (2001:170-172) who argue that such cases are true, locally conditioned, anaphoric binding.

21. The literature on logophoricity has grown considerably in recent years. See Koopman and Sportiche (1983) for the first influential syntactic analysis and see Culy (1994, 1997) and Y. Huang (2000:172-204) for some of the cross-linguistic generalizations. For the literature on Yoruba and a broader account, see Adesola (2004). Sells (1987) and Kuno (1987) explored aspects of point of view associated with logophoricity, and much recent work has addressed the semantic ‘awareness’ effect described in the text, interpreted by many (e.g. Chierchia, 1989, Cole, Hermon and Lee, 2001, Schlenker, 2003 and Anand, 2006) as *de se* in the sense of Lewis (1979). Schlenker, for example, favors an analysis whereby the indexicality of 1<sup>st</sup> person pronouns which pick out the utterer in context (see note 23) are shifted to pick out the attitude-holder, an analysis that is appealing for languages, like Amharic, that permit 1<sup>st</sup> person pronouns to act as logophors, but is not morphologically justified in most languages. See also Safir (2004c) for a syntactic A’-binding analysis based in part on Baker (1998) (but see Reuland, 2001b, for another view), an evaluation of the claim that the readings are *de se* (for a different view, see Giorgi, 2007), as well as a critique the shifted indexical analysis.

22: Bouchard (1984:58), was the first to suggest that reflexive predicates must be morphologically marked. Williams (1980, 1994) also proposes a predicate-based theory. He argues, for example, that the unacceptability of ‘*John is his cook*’ vs. ‘*John likes his cook*’ (see Higginbotham, 1983) is a Principle B violation insofar as *his cook* is predicated directly of *John*, and is not an argument of *is* (as opposed to *like*). Such cases are amenable to an Agree account if *be*, as opposed to *like*, does not establish a phase in these cases.

23. It is probably not an accident that 1<sup>st</sup> and 2<sup>nd</sup> person pronouns are most likely to lack anaphoric forms, since they normally pick out the utterer and the addressee, respectively, in the moment of speech, and so the bound reading is normally extensionally equivalent to one where the utterer is selected by each 1<sup>st</sup> person mention, for example (see note 32). Differences, however, persist between anaphoric and pronominal indexicals. In i., from Safir (2004c:110), *myself* requires a bound reading to the subject and *me* does not permit it (Heim, 1993, points out related ambiguities for ‘Only I think I will win’)

i. If I were (anyone of) you, I wouldn’t be talking to myself/me.

ii. I can defend myself more effectively than other people can.

Moreover, 1<sup>st</sup> person reflexives can get both strict and sloppy readings, as in ii. (see also Rullman, 2004). The literature on indexicality, though relevant, is too rich to treat responsibly here. See Schlenker (2003) and Higginbotham (2009) for discussion and references.

Not X24. In Safir (1997), it is shown the exempt anaphor phenomenon is evidenced for Scandinavian pronoun-SELF forms, but not for SIG or SIG-SELF forms. This may be an indication that exempt anaphors require certain internal structure (or perhaps must contain a non-anaphoric pronoun). Büring (2005:242) notes that Serbo-Croatian *sebe*, cannot act as an exempt anaphor, but Reuland and Koster (1991:24) provide an example that Dutch ‘*mzself*’ can be so interpreted.

25. This claim is based on ‘strict subject orientation’ as described in Safir (2004a:170-173).

26. For a critique of Levinson’s accounts, see Safir (2004a:62-66).

27. Y. Huang does not specify what counts as SELF in a language, but he seems to contrast, e.g., Dutch *zich/zichzelf* as SELF/SELF-SELF, which is an insufficient analysis of the morphology, and a glossing practice critiqued in note 36.

28. Except for the derivational aspect, Hornstein’s approach recalls that of Everaert (1991), who proposed that pronouns and anaphors could be inserted into representations where binding and locality determine the features that the forms would have to have, with appropriate selections from the lexicon. A version of this strategy might be feasible within a distributed morphology approach and some recent Agree-based accounts have taken this tack (e.g., Heinat, 2008, Hicks, 2009 and Rooryck and vanden Wyngaerd, to appear)

29. There has also been an attempt to model anaphoric distributions in the Optimality Theory (OT) framework (Burzio, 1998, Wilson, 2001, Fischer, 2004), where all syntactic outputs are regulated by a competition between ranked constraints. In this way of thinking, no special competitive principle is necessary since the whole grammar is built that way. Global comparison in the OT competition has its disadvantages for semantic-interpretation-based constraints, however. For example, the GEN principle cannot put *John expects himself to win* in competition with *John expects him to win*, or else *John expects him to win* would not be a possible sentence of English under any interpretation. In other words, a fully specified bound reference interpretation must be part of what GEN provides and any forms that are used to represent a specified bound meaning must be faithful to that reading - and inviolably so. The OT calculation must, in effect, build the syntax from a representation that has the complete semantics encoded in it, such as predefined scope for quantifiers binding variables, etc. or else add a new competition after the derivation is built. No work in OT has taken this consequence seriously, so I will not examine approaches of this kind further.

30. The mistaken claim that anaphors only permit strict readings is often cited (e.g., Hicks, 2009:120), but what has been shown in the literature is that some anaphors in some contexts favor only bound readings, as Hicks acknowledges on the same page in his fn.23. This is a fundamental problem for theories, like that of Hicks, that tie anaphorhood to sloppy readings only through a special bound variable property of anaphors.

It is notable that pure reciprocal forms appear never to permit strict readings in ellipsis contexts, e.g., *The girls hate each other more than the boys do*. It is not clear what a truly reciprocal interpretation anteceded by *the girls* would mean, but neither can this be taken to mean ‘*The girls* hate each other more than the boys hate *them*’. Anecdotal evidence suggests this is true crosslinguistically.

31. Fiengo and May (1994) suggest that nominals represented in the interpretation of elided VPs can be treated as pronominals (they call it ‘vehicle change’), even if their parallel overt antecedents are not.

i. Mary thinks she likes *Bill*, but *he* doesn't think she does [like *him*]  
If *Bill* had to be present in the ellipsis site, we would expect a Principle C violation, but vehicle change to a pronoun makes it possible. See Safir (2004b:29-30) for an account of strictly interpreted reflexives as vehicle-changed pronouns in ellipsis sites. Büring (2005:138-141) argues both readings should be possible, and he considers a range of preferences for reflexives in ellipsis contexts.

32. These assumptions all raise questions, if not eyebrows. Number can indeed be context independent, e.g. 'Pants that clean themselves are in high demand' where the plurality of *pants* is not context sensitive. Reuland assumes that anaphors are underspecified for number, like *zich*, which he treats as the factor that allows them to form chains (but compare Danish SIG/SIN forms, which are inherently singular and form chains). In languages like German, however, where 1<sup>st</sup> and 2<sup>nd</sup> person otherwise independent object pronouns, *mich* and *dich*, are used for local reflexive readings, Agree must treat these pronouns as lacking grammatical number (on the view that each use of them must pick out the same utterer/addressee in context), hence they are [-R] so they must form chains. On the other hand, they must then be capable of heading chains without number, since they can also be independent when they are not local (unlike Danish SIG/SIN, but like 1<sup>st</sup> and 2<sup>nd</sup> person pronouns in Danish, which can be independent). See note 23.

33: I do not have space, or the final version of Reuland (2011), to review for this essay, but in his book length treatment, Reuland further develops many of the themes of his earlier work and ties them together into a comprehensive framework, which readers are recommended to consult.

34. Heintz (2008:17) does not address the fact that the absence of a bound variable reading does not imply disjoint reference without further assumptions.

35. Some of the point of view issues pertain to predicates, not to anaphors bound in those predicates, but anaphors may have the effect of adjusting point of view, e.g., in reciprocal sentences, there are opposite viewpoints for any two participants. See Frajzyngier (2000a,b) and Kuno (1987).

36. There is a general tendency in crosslinguistic reporting to gloss reflexive morphemes, or at least morphemes that in part of their distribution are bound locally, as 'SELF', even when there is no indication that the word has any semantic stem in it, or even if it has a different semantic stem. Progress in this area will require much greater attention to these empirical details.

37. One recurrent semantic connection in the choice of anaphoric atoms is inalienable possession, insofar as body parts are typically inalienably possessed and OWN asserts possession. As noted in Safir (1996), the metonymic use of body part anaphora is idiomatic, and so the relational content of inalienable possession is employed to produce an identity marker (see also Reinhart and Reuland, 1991). As early as Helke (1971), parallels have been drawn between inalienable possession idioms (e.g., *They held their* breath) and reflexives, and in this respect possessor raising and or datives of possession should also be part of the locality discussion, but are omitted here for reasons of space. See Rooryck and vanden Wyngaerd for an approach to anaphoric patterns that relies heavily on connections between inalienable possession and

reflexivity.

38. See Reuland and Winter (2009) for a different analysis.

39. Non-local pronouns typically do not support a reciprocal reading, even where reciprocals are not possible, as in i.

i. *The boys* knew that *they*/\**each other* were planning escapes.

However, coargument coconstrual for 1<sup>st</sup> and 2<sup>nd</sup> person plural in German allow both reflexive and reciprocal readings (see Safir 2004a:93). In languages that have argument position anaphors that are bound across intervening infinitival subjects, such as Norwegian or Hindi, there is no reciprocal interpretation at a distance. See note 30.

40. Although the emphatic analysis of complex reflexives is attractive insofar as it guides interpretation, there is reason to doubt that there is a presumption that predicate arguments are disjoint (as in Huang, 2000) or that other-directedness is a general case. Rather some predicates exhibit self-directedness, such as English ‘wash’, ‘dress’, ‘stretch’, and so can be intransitive and reflexively understood, and some predicates are other-directed, such as ‘argue’, ‘kiss’ (see Dimitriadis, forthcoming, for a semantic analysis) or adjectives like ‘(dis)similar to’, or exception predicates like *everyone excepting Bill* (see Safir, 1992, 1997). These directed predicates, typically few in number in the languages that have them, tend to show special morphology (or the lack of it) and tend to belong to same small semantic classes across many languages. Most predicates, however, are not obviously directed one way or the other, i.e., English verbs like *praise*, *introduce*, *kill*, *love*, etc. do not seem to have any presupposed directedness at all.

41. The work of the Afranaph Project (ongoing) seeks to fill this gap by providing comprehensive descriptions of patterns of anaphora within particular languages, but that research is still in its infancy.

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