Issues relating to a derivational theory of binding

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1. Introduction*

The derivational approach to syntactic relations (DASR, see Epstein 1995, Epstein et al. 1998, Epstein and Seely 1999) entails that an interpretive relation between two elements α and β is a function of an operation M merging α and (a constituent containing) β. In many cases, it appears to be impossible to maintain the stronger version, where M merges α directly with β, illustrated in (1a), forcing one to also acknowledge the weaker version, where M merges α not with β directly, but with a constituent γ containing β, illustrated in (1b).

(1) a. [α β]
b. [α [γ [.. β ..]]]

The situation in (1a) applies to phrase structure relations, to the extent that they are reducible to the sisterhood relation, as well as to relations of argument structure and predication defined in terms of phrase structure, *casu quo* sisterhood. For example, in (2), the interpretive relation between a verb *love* and its internal argument *Mary* exists precisely because *Mary* has been merged with *love*:[1]

(2) [I [love Mary]]

The situation in (1b) applies to all cases where there is no sisterhood, but c-command is relevant. For example, movement cases like (3), where the moved category *who* must c-command the position where *who* was first merged (indicated by a copy of *who* in angled brackets):[2]

(3) (You wonder) [who [I [love <who>]]]

In (3), the interpretive relation between *who* and <*who*> (namely that one is a 'trace' of the other) is not a function of merger of *who* to <*who*>, but of merger of *who* to a constituent containing <*who*>.

On its strongest implementation, DASR restricts interpretive relations to the configuration in (1a), excluding the c-command case (1b). This requires a rethinking of many of the most elementary syntactic relations in grammatical theory, not least movement and binding. But the very idea that information may be accrued in the course of a stepwise derivation, crucial to DASR, already provides a solution to some of the most immediate problems.

For example, the movement illustrated in (3) need not involve a relation between *who* and <*who*>, if we consider *who* to be a single element which is merged more than once, and which acquires additional information with each merger (cf. Epstein and Seely 1999). From this perspective, there is no need to compute the properties of *who* by a process of reconstruction of *who* in its base position at an interpretive 'level' Logical Form (LF). All that is needed at the point of interpretation is an inspection of the various features acquired by *who* in the course of the derivation of the sentence (features relating to argument status and grammatical function (Case), as well as additional ('A-bar') features relating to its status as an interrogative element).[3] As noted by Epstein and Seely (1999), this approach potentially eliminates typically

representational notions like 'chain' and 'trace', as well as conditions governing the wellformedness of the relevant entities.[4]

In the present contribution, I want to consider the question whether binding relations can be redefined in a similar derivational vein. Binding of an anaphor (4), local obviation of a pronoun (5), and obviation of a referential expression (R-expression) (6) typically involve a c-commanding antecedent (in the a-examples, the antecedent c-commands the dependent element in the binding relation, in the b-examples, it does not):

(4)	a.	John loves himself	(anaphor binding)
	b. *	John's mother loves himself	(no anaphor binding)
(5)	a.	John loves him	(obviation)
	b.	John's mother loves him	(no obviation)
(6)	a.	He loves John	(obviation)
	b.	His mother loves John	(no obviation)

But unlike the relation between an antecedent and its trace, the binding/obviation relation cannot obviously be reformulated without reference to c-command (i.e. to a configuration like (1b)).

Yet this is what I am attempting here. My point of departure is the proposal by Kayne (2000, this volume), according to which (nonaccidental) coreference of α and β, where β is a pronominal element, ensues if and only if α and β are merged together yielding a constituent like (1a). This appears to be the strongest implementation of the derivational approach to binding, meriting priority consideration. I consider the consequences of this proposal for local anaphor binding first (unlike Kayne 2000, this volume, where it is applied mostly to nonlocal pronominal coreference). As the antecedent moves away from the anaphor in the course of the derivation, a movement necessitated by standard licensing requirements, conditions on local anaphor binding reduce to conditions on local noun phrase movement ('A-movement'). This in turn makes reference to c-command superfluous, as with all movement, as discussed in connection with (3).

I have found that this approach, counterintuitive though it may seem, allows one to address fundamental questions connected with theories of binding, which seemed out of reach before. These questions are:

(7) *Some fundamental questions of binding theory*

a. Why is binding limited to A-positions?

b. Why is there a morphological distinction between anaphors and pronouns (and not, generally, between bound pronouns, coreferential pronouns and pronouns interpreted deictically)?

c. Why is binding subject to locality, and why are the locality conditions the way they are?

Like Kayne (2000, this volume), I propose that these questions become tractable once binding phenomena have been reduced to movement phenomena (in this case, A-movement phenomena).

Contra Kayne (2000, this volume), I am led to believe that all other forms of coreference, including pronoun binding, as in (5b), are accidental. This is because the conditions on pronoun binding are not identical to the conditions on noun phrase movement.

The derivational approach to binding attempted here, like DASR in general, makes it unnecessary to resort to 'reconstruction' at LF of earlier stages in the derivation. For example, (8) is interpretable, not because we can reconstruct the displaced anaphor *himself* in its original

position indicated by <*himself*>, but because *John* and *himself* were merged together at some (early) point in the derivation (represented by (9)):

(8) Himself, John loves <himself>

(9) [John himself]

(8) is derived from (9) through a succession of steps, merging *loves* to *John himself*, extracting *John* from *John himself* and merging it again to *loves* <*John*> *himself*, and, finally, raising <*John*> *himself* and merging it again to *John loves* <<*John*> *himself*>. The reasoning is the same as with (3): with each new operation Merge the element merging to the structure acquires additional features which are interpreted at LF, but no 'trace' or 'chain' is created, and no information can be gathered from these entities.

The article has the following structure. Section 2 presents anaphoricity as a feature acquired by pronouns in the course of the derivation, leading to spell-out and interpretation of the pronoun as an anaphor. Section 3 lists 9 advantages of viewing anaphoricity in this way, addressing the fundamental questions of the binding theory in (7). Section 4 explores to what extent other types of anaphoricity, such as bound variable anaphora, can be viewed as 'accidental'. Section 5 discusses various effects of reconstruction (and anti-reconstruction), to see if they can be accounted for in the derivational approach. Finally, a number of remaining problems are briefly mentioned in section 6.[5]

2. Anaphoricity as acquired information

In most approaches to binding phenomena, it is taken for granted that in the Lexicon there are (at least) three types of noun phrases, listed in (10), which are subject to various requirements, the binding conditions (listed in (11)).

(10) a. anaphors (English *himself*)[6]
b. pronouns (English *him*)[7]
c. R-expressions (English *the man, Bill*)

(11) Given a local domain D,
a. anaphors are bound in D,[8]
b. pronouns are free in D, and
c. R-expressions are free.

(11a) and (11b) represent the local binding and local obviation requirements illustrated in (4) and (5), respectively, and (11c) represents the general obviation requirement illustrated in (6). Following the introduction of the classical binding theory (Chomsky 1981), much discussion addressed the question at what level of representation the conditions in (11) apply. In the minimalist approach (Chomsky 1993), conditions can apply only at the interface levels (PF and LF), and hence it was concluded that the conditions in (11) must apply at LF, yielding a slight reformulation of (11) as interpretive procedures (Chomsky and Lasnik 1993, 100):

(12) Given a local domain D,
a. if α is an anaphor, interpret it as coreferential with some c-commanding phrase in D,

b. if α is a pronoun, interpret it as disjoint from every c-commanding phrase in D, and
c. if α is an R-expression, interpret it as disjoint from every c-commanding phrase.

Both the classical formation in (11) and the reformulation in (12) raise the question in (13):

(13) What makes an element an anaphor/pronoun/R-expression?

This question is relatively easy to answer for the category of R-expressions. R-expressions are referential expressions, they represent a concept, a projection in the sense of Jackendoff (1983), expressable in terms of lexico-semantic features.[9] But for anaphors and pronouns the situation is much less clear.

The classical binding theory stipulates an ontology of noun phrase types based on the features [anaphoric] and [pronominal] (Chomsky 1982, 78).

(14)

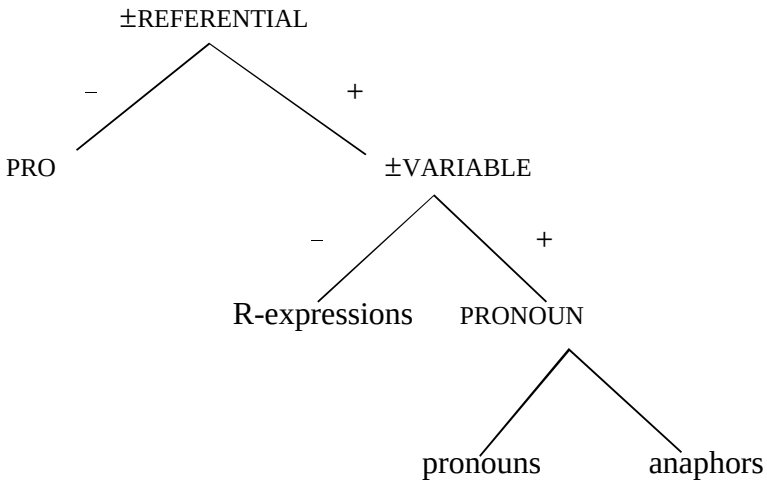
overt	ANAPHORIC	PRONOMINAL	covert
	+	+	PRO
anaphor	+	–	A-trace
pronoun	–	+	pro
R-expression	–	–	A'-trace

This classical inventory is curious in that it defines anaphors and pronouns as being maximally distinct in feature value specifications, each having more in common with R-expressions than with the other. However, the morphology of anaphors and pronouns suggests that they have much in common, as anaphors can be analysed as pronouns with added focus markers, as in (15a), or as grammaticalized inalienable possessive noun phrases containing a pronominal possessor, and often a body part noun, as in (15b):[10]

(15) a. pronominal *him*, anaphor *him-self* (English)
b. *z'n* eigen (Colloquial Dutch)
his own 'himself'
koye *men* (Fulani)
heads our 'ourselves'

These considerations suggest that the inventory of noun phrase types is more like (16) than like (14):[11]

(16)



Ignoring PRO, the subject of control infinitives, the major cut-off point in (16) appears to be between [–variable referential] elements (i.e., R-expressions), and [+variable referential] elements (pronouns and anaphors). These vary only in that in local contexts, one is chosen over the other (where pronouns are the underspecified 'elsewhere' category).[12]

This leads me to believe that syntax recognizes just a single category of [variable referential] elements, PRONOUN, which acquires features in the course of the derivation, which in turn yield a particular spell-out (at the interface component PF (Phonetic Form)) and a particular interpretation (at LF). Since pronouns are the underspecified category, the binding theory only needs to specify the conditions under which the generic category PRONOUN acquires the features that would yield the spell-out and interpretation of an anaphor.[13]

In this context, body part anaphors are instructive, since they can be used both as anaphors (17a) and as referential expressions (17b) (examples from Fulani (Peul), Sylla 1993, 149):

(17) a. en tooñ-ii koye men (Fulani)
we harm-ASP heads our
'We have harmed ourselves.'
b. koye men kell-ii
heads our hurt-ASP
'Our heads hurt.'

The expression *koye men* 'our heads' may be used referentially or as an anaphor, a grammaticalized element with bleached semantics. This suggests that anaphoricity is not a lexical property of certain expressions, but a feature that arises in a certain syntactic context. If so, anaphoricity is a property *acquired in the course of a derivation*, rather than a lexical feature which is present from the outset.[14]

On the strictest implementation of the derivational approach to syntactic relations, the features relevant to anaphoricity can only be acquired in a sisterhood configuration like (1a). This leads to the following coreference 'rule' (cf. Kayne 2000, this volume):

(18) A PRONOUN α is coreferential with β iff α is merged with β

Thus, a construction like *John hurt his head* may have the two derivations in (18):

(19) a. John hurt [<John> [his head]]
b. John hurt [his head]

In a language using body part anaphors, (18) forces an interpretation of *his head* as 'himself' in (19a), but not in (19b).

My proposal differs from Kayne's in assuming that a coreferential PRONOUN (i.e. a [+coreferential] variable referential element) is invariably spelled out at PF and interpreted at LF as an anaphor. We may think of this in terms of the antecedent bestowing a feature [+coreferential] upon the PRONOUN, which is then interpreted accordingly at PF and LF.[15] In Kayne's proposal, both anaphors like *himself* and bound pronouns like *he* in the relevant reading of (20), are merged with their intended antecedent (cf. (20b)):

(20) a. John thinks that I like him (no obviation)
b. [John him]

In my proposal, *him* is present in the syntax only as the generic variable referential element PRONOUN. Assuming (18), a derivation including (20b) would have to add [+coreferential] to the PRONOUN's set of features. While this would have the correct effect at LF, where the PRONOUN is interpreted as coreferential with *John*, it would have the wrong effect at PF, where Morphology (by (18)) would interpret the PRONOUN as an anaphor and generate an anaphor (*himself*) instead of a pronoun (*him*)(see note 13). We return to the difference between anaphors and pronouns below.

In conclusion of this section, I have proposed that what makes a variable referential element an anaphor is that it is merged with its antecedent. Other variable referential elements are spelled out as pronouns by default.

3. Consequences

A number of standard properties of anaphor binding fall out immediately from the idea that anaphors are merged with their antecedent (more exactly, are the morphological spell-out of a generic variable referential element PRONOUN which is merged with its antecedent), illustrated in (21).

(21) $[_{XP}$ [antecedent] [PRONOUN]]

These properties are discussed in the subsections below.

3.1 Asymmetry

As pointed out by Kayne (2000, this volume), asymmetries of the type observed in (22), showing that anaphors must be c-commanded by their antecedents and not vice versa, are explained on the assumption that the PRONOUN is the head of XP in (21).

(22) a. I expect John to like himself
b. * I expect himself to like John

Following the line of argumentation in Kayne (2000, this volume), (22a) is derived by extracting *John* from the XP headed by (the PRONOUN ultimately spelled out as) *himself* and (re)merging

it in the Exceptional Casemarking position. In order to derive (22b), either we would have to merge *John himself* in the Exceptional Casemarking position and lower *John* to the position of the internal argument of *like* (which is not allowed in most current approaches, including DASR), or we would have to raise the head *himself*, stranding its specifier *John*. But this would involve movement of a head into a specifier position, which is also not allowed. Thus, the asymmetry between anaphors and their antecedents follows from standard conditions on movement.

3.2 Obviation (Principle C)

Also following Kayne (2000, this volume), we derive the effects of Principle C of the Binding Theory (cf. (11c) and (12c)) immediately, since nonaccidental coreference is obtained only when two coreferential elements are merged together yielding a constituent like (21). Two noun phrases that are merged to the structure independently can be interpreted as coreferential only by accident, not as a fact of grammar.

This derives the standard Principle C effects illustrated in (23)-(24):

(23) a. John likes John
b. John thinks that I like John
(24) a. He likes John
b. He thinks that I like John

The two instances of *John* in the sentences in (23) are interpreted as disjoint by default. In order to be able to interpret the two instances of *John* in the sentences in (23) as coreferring, we would have to assume that they are merged together as a constituent, like in (25):

(25) [[John] [John]]

But since neither instance of *John* is a variable referential element, coreference is impossible to obtain.[16]

In (24), the disjoint interpretation of *he* and *John* is forced along the same lines, if *he* and *John* are merged as in (26a), or, if *he* and *John* are merged as in (26b), by the condition on movement prohibiting raising of a head (*he*) to a specifier position (Kayne 2000, this volume; cf. section 3.1):[17]

(26) a. [[he] [John]]
b. [[John] [he]]

Note that locality is not a factor here, as the pair of examples in (23) shows, since the disjoint interpretation is obtained by default.

As is well known since Evans (1980), the general obviation requirement expressed in standard formulations of Principle C of the binding theory may be lifted in circumscribed contexts, yielding 'accidental coreference'. Some examples are given in (27):[18]

(27) a. (Not many people like John, but I believe) John likes John
b. (Surely if everybody likes John, then) John likes John

The relevance of these examples is that they show that the binding conditions cannot be applied mechanically to a representation of a completed derivation (say, at LF). Principle C, if applied mechanically at LF, must rule out the examples in (27) under the intended interpretation. In the theory of Kayne (2000, this volume), there simply is no Principle C, since disjoint interpretation is given by default.

Typically, accidental coreference appears to be facilitated in contexts giving rise to ellipsis. Thus, next to (27) we have (28):

(28) a. Not many people like John, but I believe John does.
b. Surely if everybody likes John, then so must John.

Ellipsis constructions involve a (accented) focus segment combined with a (deaccented) 'topic' segment which is either repeated from previous contributions to the discourse or otherwise understood. In (27a), for example, the first instance of *John* is in focus, and the verb phrase *likes John* is understood. The part that is understood can also be left out, yielding (28a), suggesting that ellipsis is just an extreme form of deaccenting (cf. Tancredi 1992). In short, what happens is that a single element is introduced both as 'old' and as 'new'. Precisely in this situation we seem to get 'accidental coreference' (see Demirdache 1997, 76 and references cited there).[19] It is not immediately clear how Principle C could be made sensitive to these discourse considerations, suggesting that phenomena of accidental coreference are better handled in a theory that makes no recourse to a requirement of obligatory disjointness like Principle C.[20]

Other cases of accidental coreference, though perhaps not standardly viewed that way, involve non-c-commanding antecedents:[21]

(29) a. John's mother thinks John is an idiot
b. His mother thinks John is an idiot

We return to cases like (29) in section 4.

To conclude, standard effects of Principle C follow automatically from the theory of Kayne (2000, this volume), so that Principle C itself can be dispensed with.

3.3 Obligatoriness

An anaphor *must* be bound. This follows on the theory proposed here, since anaphoricity is a nonlexical, syntactically enduced property, acquired by a variable referential element (a PRONOUN) only when merged with an antecedent (as in (21)).

3.4 Uniqueness

An anaphor must be bound by a unique antecedent. Thus, a sentence like (30) cannot be interpreted as involving a split antecedent *John, Bill* to the anaphor *himself*:[22]

(30) John heard Bill curse himself

This follows since *Bill* and *John* cannot both be the antecedent in the structure (21), which I take to obey a binary branching requirement (i.e., merger is an operation that relates two categories).[23]

3.5 C-command

An anaphor must be bound by a c-commanding antecedent, as illustrated in (4), repeated here as (31):

(31) a. John loves himself (anaphor binding)
b. * John's mother loves himself (no anaphor binding)

In order to derive (31b), with intended coreference of *John* and *himself*, from (21), fleshed out here as (32a), *John* would have to be extracted from (32a) and merged internal to the noun phrase (DP) *(John)'s mother* (32b):

(32) a. [[John] [PRONOUN]]
b. [$_{DP}$ _ 's [mother]]

If the DP in (32b) is already merged to the structure containing *John* at the moment of its extraction out of (32a), the derivation violates the Extension Condition of Chomsky (1993, 190), which states that Merge must extend existing structure:

(33) *Extension Condition*
No operation Merge applying to a phrase marker α targets a node dominated by α.

If the DP in (32b) has not yet been merged to the structure containing *John* at the moment of its extraction out of (32a), the displacement operation targets two independent phrase markers (yielding an 'interarboreal operation'). I take the impossibility of coreference in (31b) to provide clear evidence that such a derivation is disallowed.[24]

3.6 Locality

It has been clear since Chomsky (1981) that the locality conditions on anaphor binding are strikingly similar to the locality conditions on noun phrase movement (A-movement).[25] In the present framework, the similarity is not surprising, assuming that the noun phrase antecedent in (21) is forced to move away from the anaphor into an A-position.

I assume here that noun phrases, in order to be interpretable at LF, need to acquire in the course of the derivation features relating to argument structure status (thematic roles) and grammatical function (subject/object, Case).[26] The antecedent noun phrase in (21) has neither. It must therefore be extracted from the constituent in (21) and be merged to the structure in positions where the relevant features may be acquired. Since these positions are (by definition) A-positions, the relevant noun phrase movement must be A-movement.[27]

A-movement is in principle clause bound, with the exception of Exceptional Casemarking (ECM) configurations, where two (or more) verbs share a single functional domain (composed of the set of functional projections where grammatical functions are licensed ('where Case is assigned')). This is more easily illustrated in Dutch than in English (where the syntax of Exceptional Casemarking is still somewhat obscure):

(34) *Exceptional Casemarking*

..dat	Jan	Piet	Marie	niet	<Jan>	zag	<Piet>	kussen	<Marie>
that	John	Pete	Mary	not		saw		kiss-INF	

'..that John did not see Pete kiss Mary.´

In (34), the negation *niet*, interpreted as a matrix clause element, serves to indicate the lower boundary of the matrix clause functional domain. The matrix clause functional domain contains projections licensing *Piet* and *Marie* as grammatical objects (they receive accusative Case when pronominal) and *Jan* as a grammatical subject.[28] As these positions are apparently sufficiently local for A-movement of the arguments of the embedded verb, the local domain for A-movement of α may be defined in terms of the maximal functional domain associated with the verb projecting the functional projection in which α is licensed. If the association of a verb and its functional domain is expressed as 'L-relatedness' (following Chomsky and Lasnik 1993, 64), the definition of the local domain for A-movement becomes:

(35) *Local domain for A-movement (the L-domain)*
The local domain for A-movement of α is the maximal projection of the highest functional head *f* L-related to a verb *V* L-related to a functional head *f'* licensing α

According to (35), if the argument of an embedded verb is licensed in a functional projection associated with a matrix verb, then the maximal functional projection L-related to the matrix verb is the local domain for A-movement.

As is well known, the extension of the local domain in ECM configurations is also needed to account for anaphor binding by an argument of a higher verb, as in (36):

(36) a. John saw himself kiss Mary

b.

..dat	Jan	zichzelf	Marie	zag	kussen	(Dutch)
that	John	himself	Mary	saw	kiss-INF	

Both A-movement and binding beyond the L-domain as defined in (35) is impossible:

(37) a. * John believes that we expect himself to kiss Mary
b. * John seems (that) will kiss Mary

The locality effects of A-movement and binding raise two questions:

(38) 1. Why are anaphor binding and A-movement subject to the same locality conditions?
2. What explains the definition of the local domain?

Within the theory advanced here, the answers are clear.

First, anaphor binding and A-movement are subject to the same locality conditions because anaphoricity is established by merging a PRONOUN with its antecedent as in (21), after which the antecedent must move out and merge again in positions where it can acquire features indicating its thematic role and grammatical function. These positions are A-positions by definition (note 27).

Second, the local domain for A-movement is defined by the maximal functional projection in which a noun phrase acquires the features it needs (i.e. thematic features and Case features). I would like to propose that movement out of that functional projection can only serve the

purpose of acquiring additional features. This excludes merger in additional A-positions. Thus, A-movement is limited by an economy condition reminiscent of the principle of 'Greed' of Chomsky (1993, 201). On our theory, the locality of anaphor binding is likewise a result of Greed.[29]

This view on locality implies that functional projections L-related to V must be realized in close proximity to V, perhaps before any A'-projections are merged to the structure, but certainly before a complementizer is. If this is correct, Principle A of the classical binding theory (cf. (11a)) is deduced from the derivational approach to binding, involving merger of binder and bindee in a construction like (21), in conjunction with the economy condition Greed.

3.7 Binding restricted to A-positions

In the Government and Binding theory, binding is restricted to A-positions (Chomsky 1981, 184). This accounts for the fact that (39) does not induce a Principle C violation (where *himself* has been fronted into an A'-position c-commanding *John*):

(39) Himself, John likes

However, simply excluding A'-positions from consideration in computing binding and disjointness does not suffice, witness the contrast in (40):

(40) a. John, I like him
b. * Him, I like John

Moreover, the restriction of binding to A-positions is unexplained in classical approaches, and somewhat unexpected from the DASR point of view. Other processes resembling binding (in requiring c-command, for instance), such as negative polarity item (NPI) licensing, are not restricted to A-positions (i.e., are not computed over A-positions only):

(41) a. Niemand heeft ook maar iets gedaan
nobody has anything-NPI done
'Noone did a single thing.'
b. * Ook maar iets heeft niemand gedaan
anything-NPI has noone done

This raises the question why binding is special in that it is restricted to A-positions.

In our theory, since there is no Principle C, (39) is unproblematic. The coreference of *John* and *himself* is already established at an early stage in the derivation, represented by (42a), after which *John* is extracted and merged in the subject position, and XP may be moved across *John* to the topicalization position (42b):

(42) a. $[_{XP}$ John PRONOUN]
b. [$[_{XP}$ <John> PRONOUN] [John [likes <$[_{XP}$ <John> PRONOUN]>]]]

Afterwards, the PRONOUN gets spelled out at PF as *himself* and interpreted at LF as anaphoric to *John*.

Nowhere in the description of (39) is it necessary to acknowledge the distinction between A- and A'-positions.[30] Binding *appears* to be restricted to A-positions because, in our theory, the binding relations established when the antecedent and the anaphor are merged together (yielding (21)) cannot be undone by A'-movement (or by any other operation).

Without Principle C, the contrast in (40) is in need of an alternative explanation. A comparison with Dutch suggests that left dislocation constructions of the type in (40) require a particular division of roles between the left-dislocated element and a variable referential resumptive element (fronted in Dutch, but not in English):[31]

(43) a. Jan, die mag ik wel (Dutch)
John DEM-NNTR may I AFF
'John, I like him.'

b. * Die, Jan mag ik wel
DEM-NNTR John may I AFF

The example in (43b), the Dutch version of (40b), is characterized by a reversal of roles, the resumptive element taking up the left dislocation position, and the referential expression trying to perform as a resumptive element. I suggest that nothing else is wrong with (40)/(43).

The contrast in (41) suggests that the A-movement analysis of anaphoric binding explored here cannot be extended to NPI-licensing. This is supported by the observation that NPI-licensing is not restricted to the L-domain (35):

(44) Niemand verwachtte dat ook maar iemand iets zou doen (Dutch)
noone expected that anyone-NPI something would do
'Noone expected a single person to do anything.'

Note that our analysis of (39) needs no recourse to an LF-operation reconstructing the stage before topicalization of *himself* ('reconstruction'), a topic to which we return in section 5 below.

3.8 Local obviation (Principle B)

The local obviation effects of pronouns, illustrated in (5), repeated here as (45), need not be accounted for by a separate Principle B (cf. (11b), (12b)).

(45) a. John loves him (obviation)
b. John's mother loves him (no obviation)

In our theory, if *John* and *him* in (45a) are to be interpreted as coreferring, they must be merged together in a constituent like (46) (cf. (21)):

(46) $[_{XP}$ [John] [PRONOUN]]

Note that on our assumptions, (46) involves no pronouns or anaphors, but just the generic variable referential element PRONOUN. In the context (46), the PRONOUN acquires the feature [+coreferential], which is interpreted by Morphology as an instruction to return the spell-out *himself* (rather than the default form *him*; see note 13). Thus, under the intended, coreferential interpretation, (45a) will always be realized as (47).

(47) John loves himself

The absence of obviation in (45b) need not surprise us. Like (29), this is a case of accidental coreference, not reducible to movement by the same reasons that exclude (31b).

Note that our explanation of local obviation effects raises the question how nonlocal coreference, as in (48), is derived.

(48) John thinks that he is a genius

Kayne (2000, this volume) proposes to describe coreference of *John* and *he* as a function of *John* and *he* being merged together, the original idea that gave rise to the present contribution:[32]

(49) John thinks [$_{CP}$ that [<John> he] is a genius]

However, in order for *John* to raise to the subject position in the matrix clause, it would have to move to the specifier position of CP first, which is an A'-position. The next movement step would take *John* back to an A-position, yielding (disallowed) improper movement. This leads me to believe that the coreference of *John* and *he* in (48) is in fact accidental. We return to cases like (48) in section 4 below.

3.9 Absence of nominative anaphors

The general absence of nominative anaphors (in nominative-accusative languages) is also explained in the theory advanced here.[33]

Note first that, if an external argument is present, an internal argument can only be realized as an object (Burzio's Generalization, Burzio 1986, p. 178). Thus, if a constituent like (21) is merged in the internal argument position (50i), and the antecedent is extracted and merged in the external argument position (50ii), the remnant noun phrase headed by *himself* will have to be licensed as an object, not as a subject (50iii). As a result, the anaphor will not acquire the nominative Case features connected with the subject position.

(50)

	subject position	*object position*	*ext.arg. pos.*	*verb*	*int.arg. pos.*
(i)				V	[John himself]
(ii)			John	V	[<John> himself]
(iii)		[<John> himself]	John	V	<[<John> himself]>

Alternatively, (21) could be merged in the external argument position (51i). This will allow the noun phrase headed by *himself* to become a subject (51ii):

(51)

	subject position	*... ext.arg. position*	*verb ...*
(i)		[John himself]	V
(ii)	[John himself]	<[John himself]>	V

However, the derivation will succeed only if the antecedent, still locked within the noun phrase headed by *himself*, can move to a position in which it may acquire a thematic role. Such a position

must be found within the same L-domain (cf. (35)), which defines the locality conditions on A-movement. The only configuration in which the various conditions are met is the ECM configuration. Assuming, as before, that the arguments of the verb in an ECM complement clause are licensed as objects in the functional domain of the matrix verb, the derivation of an ECM construction with an anaphoric embedded external argument will look like (52):

(52)	*object position*	*ext.arg. pos.*	*ECM verb*	*ext.arg. pos.*	*verb* ...
(i)			V	[John himself]	V
(ii)		John	V	[<John> himself]	V
(iii)	[<John> himself]	John	V	<[<John> himself]>	V

In both (50) and (52) the only element ending up in the subject position (to the left of the object position in (52)) is *John*, not (the noun phrase headed by) *himself*. As a result, syntax never yields a PRONOUN marked by a combination of the features [coreferential] and [nominative], and Morphology will never be forced to return a nominative anaphor for a PRONOUN.[34]

Note that previous discussions of the absence of nominative anaphors have mentioned the possibility that an (accidental) gap in the pronoun paradigm might be (partially) responsible for the lack of nominative anaphors (cf. Everaert 1990 and references cited there). The approach advocated here explains this gap in the pronoun paradigm.[35]

3.10 Conclusion

Following Kayne (2000, this volume), and consonant with the derivational approach to syntactic relations, I have proposed that coreference is a function of merger. More precisely, I have proposed that (nonaccidental) coreference of α and β results if and only if α has been merged with β in a structure like (21), where α is the antecedent of the PRONOUN β, and β is the head of the noun phrase XP containing α.

(21) $[_{XP}$ [antecedent] [PRONOUN]]

The antecedent, a noun phrase, needs to move out of XP into a position in which it may acquire features indicating its argument structure status ('thematic role') and grammatical function ('Case'). Since the target for the noun phrase movement is an A-position (by definition), anaphor binding is essentially reduced to A-movement.

This theory of anaphor binding explains a number of fundamental properties of binding which had to be stipulated in earlier approaches (cf. (7)). The fact that binding is restricted to A-positions is explained because the antecedent in (21) needs to move to an A-position. The fact that the local domains for binding and A-movement coincide is also explained by the reduction of binding to A-movement. And finally, the fact that there is a morphological distinction between anaphors and pronouns (such that anaphors are marked variants of pronouns), but not among the various types of pronouns, follows from the assumption that anaphors are in fact pronouns that acquire an additional feature [+coreferential] in the configuration (21), in conjunction with the idea that morphological realization is a postsyntactic process (note 13).

The circumstance that these fundamental questions receive a relatively straightforward answer suggests to me that the current approach is on the right track.

4. Other types of anaphora

Various other types of anaphoric reference have not been discussed so far, and cannot be discussed in great detail within the confines of this contribution. What follows is a brief discussion of their properties, from the point of view of the theory of anaphoric binding explored here.

With the exception of reflexive pronouns of the type of *zich* in Dutch (SE-reflexives in the terminology of Reinhart and Reuland 1993) and reciprocals (English *each other*, Dutch *elkaar*), other types of anaphoric binding, such as binding of logophors/long distance anaphors, pronouns, and bound variable anaphora, are not necessarily local (i.e. contained within the L-domain (35)). This suggests that the relation between these other types of anaphors and their antecedents is not in fact established by merging the anaphor with its antecedent in a constituent like (21) and displacing the antecedent via A-movement (*pace* Kayne 2000, this volume). This raises the question of how the anaphoric interpretation can be derived in these cases.

To start with SE-reflexives, the crucial observation is that SE-reflexives (Dutch *zich*) do not alternate freely with true anaphors (Dutch *zichzelf*):

(53) a. Jan haat zichzelf/*zich (Dutch)
John hates SE-SELF/SE
'John hates himself.'

b. Jan schaamt zich/*zichzelf
John shames SE/SE-SELF
'John is ashamed.'

c. Jan wast zichzelf/zich
John washes SE-SELF/SE
'John washes himself.'

In (53a), only the anaphor *zichzelf* can be used, and in (53b) only the reflexive. In (53c) both the anaphor and the reflexive can be used, but the interpretation is not the same in the two cases (Rooryck and Vanden Wyngaerd 1998, Ter Meulen 2000). For example, the anaphor, but not the reflexive can be used in a situation where John is washing a statue of himself. Thus, *zichzelf* represents a separate participant ('the self as other', in the expression of Rooryck and VandenWyngaerd 1998), and *zich* does not.

The observation that the anaphor represents a separate participant is not incompatible with the view of anaphoric binding explored here. The anaphor in (21) heads a noun phrase independently of the antecedent, which sits in the specifier position of the noun phrase but must collect its thematic role and grammatical function elsewhere.

Reflexives, like anaphors, cannot be bound outside the L-domain (35):

(54) Jan liet toe [dat ik hem/*zichzelf/*zich waste] (Dutch)
John let to that I him/SE-SELF/SE washed
'John allowed that I washed him.'

Both reflexives and anaphors can be bound in the 'subject' position in ECM-constructions:[36]

(55) Jan zag zichzelf/zich/*hem mij (al) wassen (Dutch)
John saw SE-SELF/SE/him me already wash
'John saw himself wash me'/'John could already see himself wash me.'

As the object of the perception verb *zien* 'see' in this construction is an argument of the embedded verb *wassen* 'wash', this example shows that *zich* need not be a co-argument of its antecedent. The observations suggest that *zich* is generated as the head of a separate noun phrase, just like *zichzelf*.

I would like to propose that *zich* is one of the two possible spell-outs of a [+coreferential] PRONOUN, and that its special properties (i.e. the special interpretation at LF and the spell-out by Morphology as a SE-reflexive) derive from what happens to *zich* after the antecedent has been extracted. As is well-known, *zich* shows the properties of a clitic, suggesting that it is adjoined to a lexical or functional head in the course of the derivation (cf. Zwart 1991).[37] If this adjunction involves the further acquisition of features, the possibility is expected that in the spell-out procedure Morphology will not return *zichzelf*, but a special clitic form.

Reciprocals (English *each other*, Dutch *elkaar*) show the same locality effects as true anaphors (although English *each other* can also be logophoric, see below):

(56) a. De jongens haten elkaar (Dutch)
the boys hate each other
b. * De jongens denken dat ik elkaar haat
the boys think that I each other hate
'The boys think that I hate each other.'
c. De jongens zagen elkaar lopen
the boys saw each other walk

This suggests that reciprocal binding be described in the same way as anaphor binding, i.e. as resulting from the merger of the reciprocal with its antecedent in a configuration like (21). However, we must ensure that the PRONOUN in case of reciprocity is spelled out as *elkaar* and in cases of nonreciprocity as *zichzelf*:

(57) a. De jongens zagen [<de jongens> zichzelf] (Dutch)
the boys saw themselves
b. De jongens zagen [<de jongens> elkaar]
the boys saw each other

I would like to propose that a reciprocal is not the spell-out of a generic PRONOUN, but of a different element, derived through grammaticalization of a more complex category involving a floating quantifier (*elk* 'each', *each*) and a noun phrase (*aar<ander* 'other', *other*). Thus, although syntax does not distinguish anaphors and pronouns before spell-out, it does recognize the separate category RECIPROCAL. As before, interpretation of the RECIPROCAL in connection with a particular antecedent (i.e., interpretation of the antecedent-reciprocal relation) can only take place if the antecedent and the reciprocal have been merged together in a constituent like (21).[38]

It seems that the default (nonanaphoric) spell-out of the RECIPROCAL in Dutch is *de ander* 'the other:

(58) a. * De jongens haten de ander (Dutch)
the boys hate the other
b. De jongens denken dat ik de ander haat
the boys think that I the other hate

In our theory, *de ander* would be the form returned by Morphology when encountering a RECIPROCAL that was never merged with an antecedent, i.e., the reciprocal variant of the (nonanaphoric) pronoun. *De ander* is also used in subject position (59a) and inside a subject noun phrase (59b).

(59) a. De jongens denken dat de ander een genie is (Dutch)
the boys think that the other a genius is
'The boys each think that the other is a genius.'
b. De jongens denken dat de ander z'n vriendin het leukst is
the boys think that the other his girlfriend the cutest is
'The boys think that each other's girlfriend is the cutest.'

As expected, *de ander* is not obligatorily bound, anymore than an ordinary pronoun would be:

(60) De jongens denken dat ze genieën zijn (Dutch)
the boys think that they geniuses are

Ze 'they' in (60) can be interpreted as 'the boys' or as some other persons familiar in the discourse. Likewise, *de ander* 'the other' in (59) can be interpreted as some discourse familiar person who is not the same as some other person previously mentioned.

It seems that in English, *each other* can also be used logophorically, in examples like (61):[39]

(61) They knew that pictures of each other would be on sale

Because of the fact that logophors are bound nonlocally, they cannot be analyzed along the same lines as true, locally bound anaphors in our approach. Logophors behave differently from true anaphors, in that their antecedents may be picked up in the course of a derivation, as in (62a), contrasted with the case of a true anaphor in (62b), from Dutch:

(62) a. John wonders which pictures of himself Bill saw (*himself* = *Bill* or *John*)
b. Jan vroeg zich af welke foto's van zichzelf Piet gezien had
John asked SE off which pictures of SE-SELF Pete seen had
'John wondered which pictures of himself Pete saw.' (*zichzelf* = *Piet*)

This supports the idea that the relation between a logophor and its antecedent is established in a way quite different from true anaphor binding (cf. Sells 1987).

This raises the question, not resolved here, why English has no morphological distinction between logophors and true anaphors.[40] In the morphology-after-syntax approach adopted here (cf. note 13), it is not immediately expected that Morphology returns the special [+coreferential] form (i.e., the true anaphor) in other contexts as well. Perhaps this is an accidental fact of English pronoun paradigms, where the anaphor appears to be a grammaticalized emphatic pronoun.

Pronouns can be nonlocally bound, as in (63):

(63) John thinks that he is a genius

We have seen that local binding of a pronoun (the Principle B effect) is an effect of spell-out. A PRONOUN that is marked [+coreferential] will always be spelled out as an anaphor. Local coreference of a pronoun with an antecedent can only come about accidentally, in cases like (64):

(64) (As for John, if everyone likes him, then surely) John must like him

It is a consequence of our theory that the coreferential interpretation in (63) is accidental as well, even if much easier to obtain than in local contexts like (64).

Note first of all that coreference in (63) is optional, raising the question what factors assist in biasing a coreferential or noncoreferential interpretation. One factor that might be important is that *he* in (63) may be regarded as a 'self-oriented' pronoun, where the 'self' is not the speaker uttering (63) but the creator of the proposition selected by the verb *think* (Tancredi 1997). The phenomenon of 'self orientation' is more familiar from reference to the speaker (by 1st person pronouns), but occurs equally in contexts like (65):

(65) Chris frowned. Now he would be all alone.

In both (63) and (65), *he* refers not directly to an antecedent, but to the person responsible for the utterance in which it occurs, in much the same way as 1st person pronouns do. This carries over to cases like (66), where the antecedent is a quantified noun phrase:

(66) Every student thinks he is a genius

As is well known, (66) lacks the reading that would be expected under a naive conception of coreference, namely that every student thinks that every student is a genius. If *he* is viewed as a self-oriented pronoun, it refers to the individual owner of each instance of the thought 'I am a genius', yielding the correct interpretation. This obviously cannot be the whole story, but it serves to indicate the kind of factors that may be involved.

Pronouns like *he* in (66), which are interpreted in connection with a quantified noun phrase ('bound variable anaphora'), need not be bound by a c-commanding antecedent:

(67) [Everyone's mother] thinks he is a genius

This suggests that the binding relation between *he* and its antecedent (*everyone* in (66)-(67)) is not established by merging *he* and *everyone* in a constituent like (21). As discussed in section 3.5, the option of merging an antecedent in the specifier of a DP must not be allowed, in order to exclude binding of a true anaphor by a non-c-commanding antecedent:

(68) * [Everyone's mother] likes himself

This supports the idea, advanced here, that the proposal of Kayne (2000, this volume) to describe coreference as a function of sisterhood of the antecedent and the dependent element applies to anaphor binding only, and that pronoun binding comes about in a different way.

Bound pronouns (bound variable anaphora) are a separate phenomenon in that the relation between the pronoun and its antecedent is mediated by an expression which is referentially dependent on the antecedent (Rullmann 1988). Thus, in (67), the expression *everyone's mother* evokes a set containing all and only the persons who are the mothers of the persons referred to

by *everyone*. In terms of Jackendoff (1983), we may think of *everyone's mother* as projecting a TYPE consisting of a number of TOKENs, where the TOKENs are (projections of) individuals (mothers) identified by the reference of *everyone* (i.e., the projection of a collection of understood individuals). I would like to suggest that this situation makes the reference of *everyone* sufficiently salient for the relevant individuals to be interpreted as referred to by *he*. But the coreference is still optional and hence accidental. In contrast, the coreferential interpretation of an anaphor and its antecedent is not optional and is not sensitive to referential dependency (witness the ungrammaticality of (68)).

Various other properties of 'bound' vs. '(accidentally) coreferential' pronouns are discussed in the literature (e.g. Lasnik 1976, Reinhart 1976 and 1983, Evans 1980, Higginbotham 1980), but although the differences are clear, they do not automatically lead to the conclusion that pronoun binding is not accidental. Thus, backward linking is allowed with ordinary pronouns, but not with bound pronouns:

(69) a. [People who know him] say John/*every linguist is a genius
b. [His mother] loves John/*everyone

Likewise, although strict c-command by its antecedent is not required for bound variable anaphora (cf. (67)), it seems that bound variable anaphora must be c-commanded by an element referentially dependent on the antecedent (Rullmann 1988). This is not the case with pronouns that are interpreted as coreferential with nonquantified expressions:

(70) a. People who know every linguist believe he is a genius (no bound interpretation)
b. People who know John believe he is a genius (coreferential interpretation allowed)

Furthermore, contexts disallowing bound pronouns do not admit of a sloppy interpretation of pronouns in ellipsis (Lasnik 1976, 20):

(71) People who know John believe he is intelligent and people who know Bill do, too (sc. believe John/*Bill is intelligent)

Discussion of each of these differences would take us too far afield at this point. To us, the more telling observation is that the PRONOUNs are spelled out the same in all of these cases, whether interpreted as bound variable anaphora or not. In each case, the PRONOUN gets the default spell-out of an ordinary pronoun. Moreover, the morphological identity of bound variable anaphora and ordinary pronouns does not appear to be an isolated fact of English.[41] This suggests that a PRONOUN does not acquire any additional features in the course of the derivation when a bound variable interpretation is intended, hence that the interpretation of a pronoun is not determined by its derivational history.[42]

5. Reconstruction

The theory of Kayne (2000, this volume), according to which α is (nonaccidentally) interpreted as coreferential with β if and only if α and β are merged together in a constituent like (21)—which I have argued applies to true anaphoric binding only—, entails that coreference is established once and for all at the moment of merger of the antecedent and the dependent element (see also Epstein

et al. 1998, p. 63f). This eliminates the need for a reconstruction operation at LF, accounting for anaphoric binding of displaced dependent elements, as in (72a):

(72) a. Himself, John knows well
b. [knows [$_{XP}$ John PRONOUN]]

As discussed above, the derivation of (72a) involves the earlier stage (72b), where coreference of *John* and *PRONOUN* is established through sisterhood (after which *John* moves to the subject position and the remnant XP is topicalized to yield (72a)). As a function of the sisterhood configuration, the PRONOUN acquires the feature [+coreferential], which leads to spell-out as an anaphor at PF and interpretation as an anaphor at LF.

Since the theory of binding explored here involves no disjointness conditions like Principle B and C of the classical binding theory (cf. (11)-(12)), it is not entirely unexpected that disjointness effects (whatever their cause) may be lifted in the course of a derivation. This is indeed what we find ('anti-reconstruction', cf. Van Riemsdijk and Williams 1981):

(73) a. He likes every book that John wrote (obviation)
b. [Which book that John wrote] does he like best (no obviation)

(73b) is problematic for a theory which involves reconstruction of displaced elements at LF, feeding the interpretation of variable referential elements (like *he* in (73)). Reconstruction of *which book that John wrote* would restore *John* to a position c-commanded by *him*, yielding a violation of Principle C of the binding theory (11c).[43] In our theory, disjointness is not marked at any stage in the derivation (unlike coreference), and it is not excluded that in the course of the derivation, circumstances arise which favor an (accidental) coreference interpretation.

It seems to me that one crucial factor facilitating (accidental) coreferen-ce in cases like (73b) is identified in Heycock (1995, 558f). Heycock notes contrasts like (74):[44]

(74) a. Which stories about Diana did she most object to? (no obviation)
b. How many stories about Diana does she want us to invent? (obviation)

As Heycock points out, the fronted noun phrases in (74a) and (74b) differ in that *which* in (74a) signifies the presupposed existence of a set of stories about Diana, whereas the fronted noun phrase in (74b) is 'nonreferential' (in the sense that such a presupposition is not signified). This makes it much easier to interpret *Diana* as a discourse familiar entity in (74a) than in (74b), allowing a reading of (74a) in which both *Diana* and *her* 'hark back' to the same discourse familiar entity.[45]

More exactly, the intonational properties of the fronted noun phrase in (74a), where *Diana* is deaccented, present (the projection of) Diana as a discourse familiar entity. The deaccenting signals familiarity, whether Diana was mentioned prior to the utterance (74a) or not. This appears to be typically the case with coreferential R-expressions contained in sentence level adjuncts, which generally precede the main clause containing the pronoun, but not always (Klein 1980, 217):

(75) a. Voordat Eline er erg in had, was ze haar verloofde al kwijt (Dutch)
before Eline it noticed was she her fiancé already rid
'Before Eline noticed it, she had already lost her fiancé.' (no obviation)
b. Ze was haar verloofde al kwijt, voordat Eline er erg in had
she was her fiancé already rid before Eline it noticed
'She had already lost her fiancé, before Eline noticed it.' (no obviation)

I would like to suggest that the fronted noun phrases in (73b) and (74a), by their displacement into a sentence level A'-position, acquire the status of an adjunct facilitating a coreferential interpretation under the relevant intonation.[46]

The issue of reconstruction is closely related to the question of where the binding conditions apply. It is within the spirit of the DASR program that the binding conditions apply at each point in the derivation, whereas it is within the spirit of the minimalist program more generally that the binding conditions apply at LF only. Lebeaux (1998) argues that the 'positive' binding condition Principle A applies at LF, whereas the 'negative' conditions Principles B and C apply throughout the derivation (cf. (11)-(12)).[47] Part of the evidence for this division is derived from examples like (76), where *himself* in (76b) can ignore the 'lower' antecedent *Bill* and pick *John* as its antecedent at a late stage in the derivation, while *Bill* must be interpreted as disjoint from *he* in (76a):

(76) a. John wondered which pictures of Bill he saw (obviation *Bill—he*)
b. John wondered which pictures of himself Bill saw
(binding *John—himself* or *Bill—himself*)

In fact, the situation is much more complicated, since, as we have just seen, the obviation in configurations like (76a) is not always enforced, and *himself* in (76b) is a logophor rather than an anaphor (cf. (62); see note 25).

On the theory advanced here, the question of where the binding principles apply evaporates. There is just a single binding condition, namely that coreference is established only by merging the antecedent and the anaphor (in fact, the generic PRONOUN) yielding a constituent as represented in (1a)/(21) at an early point in the derivation. Coreference relations thus established are fixed once and for all time (i.e., until the interface levels PF/LF). Disjointness is not governed by principles, but is the default interpretation, which can be overruled under the influence of various factors and at various points in the derivation.

This theory also excludes the possibility, argued for in Branigan (2000), that anaphor binding is established in covert syntax (i.e., after the spell-out point in the derivation). In the theory advanced here, if an anaphoric relation would be established at LF it would have the effect that an element *not* spelled out as an anaphor at *PF* (i.e., an element spelled out as an ordinary pronoun) be interpreted as an anaphor at *LF* (see note 13 on the architecture of the grammar assumed here). Indeed, evidence showing that anaphoricity can be established at LF appears to be hard to come by, a circumstance which our theory explains immediately.[48]

6. A few words on remaining problems

The theory of local anaphor binding advanced here meets with a serious problem involving interaction of binding and raising. The relevant cases are illustrated in (77), where the anaphor

is contained within an adjunct PP in the matrix clause, and the antecedent is taken to originate inside the embedded clause:

(77) a. John seems to himself [to be a genius]
b. John was expected by himself [to become class president]

It is standardly assumed that in these constructions the antecedent *John* originates within the embedded clause indicated with brackets in (77), as *John* is interpreted as the external argument of the predicate *a genius/class president*.[49] Therefore, the source of the coreference with *himself* cannot be that *John* and *himself* are merged together as in (21), unless the adjunct PPs are generated in a lower position than currently assumed.

It seems to me that the phenomena in (77) can only be reconciled with the theory of local anaphor binding explored here if the standard assumption that these examples involve raising out of the embedded clause is abandoned. Such a serious digression from the standard analysis of the relevant phenomena cannot be defended within the confines of this article. I can, however, indicate why I think such a digression would be worth pursuing (leaving the actual pursuing to another occasion).

As for the raising example (77a), it is interesting to note that verbs like *seem* appear to lose their raising characteristics in the presence of an experiencer PP.[50] This is suggested by the facts in (78), discussed by Lebeaux (1998), where the presence of the experiencer PP blocks a 'downstairs' interpretation of the matrix clause subject:

(78) a. Two computer experts seem [to be expected to crash every system]
b. Two computer experts seem to each other [to be expected to crash every system]

Whereas (78a) has a reading in which *every system* takes scope over *two computer experts*, yielding the interpretation 'two arbitrary computer experts for each system', (78b) does not, yielding only the interpretation 'two given computer experts for the entire set of systems'. This would be accounted for if *seem* loses its raising characteristics when an experiencer PP is present.[51]

As for the passive case (77b), the analytic passive of the later stages of most Indo-European languages seems to lend itself to an analysis where the past participle is regarded as an adjectival predicate taking the subject as its external argument (79a), as with ordinary adjectival predication (79b):

(79) a. was [John [arrested]]
b. was [John [sick]]

The possibility of coreference in (77b) would then be accounted for if the *by*-phrase were contained within the adjectival predicate, as in (80).

(80) was [John [arrested by himself]]

In a structure like (80), our analysis of coreference as resulting from the merger of the antecedent with the anaphor (as in (21)) can be implemented without problems:

(81) was [John [arrested by [<John> himself]]]

This analysis makes the clear prediction that languages featuring true morphological passivization should not allow anaphors to appear in the *by*-phrase. This prediction finds initial support in Anagnostopoulou and Everaert (1996, 14), according to whom Greek (which has a morphological passive) observes a 'thematic prominence' requirement disallowing binding of an agent (in a *by*-phrase) by a theme (the subject of the passive):

(82) * O monos kureas pu ksiristike pote apo ton eafto tu itan o Figaro (Greek)
the only barber who shave-PASS ever by himself was Figaro
'The only barber who was ever shaved by himself was Figaro.'

A more thorough discussion of the phenomena illustrated in (77) and their relevance to the theory of local anaphor binding explored here would require further study.

7. Conclusion

In this article I have argued that a locally bound anaphor is the marked spell-out of a generic variable referential element ('PRONOUN') which has acquired, in the course of the derivation of the sentence in which it occurs, a special feature indicating its coreferentiality with an antecedent. I have explored the possibility, consonant with the strictest implementation of the derivational approach to syntactic relations (Epstein et al 1998, Epstein and Seely 1999), that the PRONOUN acquires the feature [+coreferential] as an automatic consequence of a derivational procedure which merges the PRONOUN with its antecedent, as proposed by Kayne (2000, this volume). I have argued that if we take this procedure to apply to locally bound anaphors only, a number of properties of local anaphor binding are explained, most importantly the fact that it is subject to the locality conditions on A-movement. These results require that we take the coreferential interpretation of an unmarked pronoun (i.e. a pronoun not marked for anaphoricity) to be essentially accidental, i.e. not an automatic consequence of the derivational procedure as proposed by Kayne (2000, this volume).

The proposal discussed here shares with Kayne's the important consequence that almost all of the traditional binding theory (of Chomsky 1981, 1982) disappears. Coreferentiality is a function of the operation Merge, not of some interpretive procedure to be captured by various principles. There is no issue of the level of representation at which the binding theory applies, as coreferentiality is fixed once and for all at the stage in the derivation where the PRONOUN is merged with its antecedent. Finally, it is explained that the local domain for anaphor binding coincides with the local domain for A-movement, on the assumption that the antecedent, after being merged with the PRONOUN, needs to be extracted and remerged in an A-position (the thematic and Case positions needed for the antecedent's proper interpretation).

These considerations suggest to me that the computational system of human language establishes grammatical relations only by merging the relevant entities in a sisterhood configuration like (1a), repeated here for convenience:

(1a) [α β]

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Notes

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1. The example is chosen for illustrative purposes. I follow Hale and Keyser (1998) in assuming a more detailed structure of the verb phrase than the one employed here.

2. α c-commands β iff α is merged with (a constituent containing) β (see Epstein 1995).

3. Note that this raises the question why elements can only be merged in positions c-commanding their previous position (i.e. the c-command requirement). To a large extent this can be derived from the Extension Condition of Chomsky (1993), limiting merger to the top node of existing structure. See Epstein et al. (1998, pp. 139ff) for discussion.

4. This holds as well of notational variants of 'traces', such as the 'slashes' of Gazdar (1981).

5. The written version of Kayne (2000), which appears in this volume, only came to my attention when the present article was in its final copy editing stage. Unfortunately, the publication schedule made it impossible for me to address Kayne (this volume) more squarely and to eliminate unnecessary restatements of Kayne's proposals and arguments.

6. Anaphors are standardly taken to include reciprocals (English *each other*) and reflexives (Dutch *zich*), but these elements each have their own distribution and interpretation, not necessarily coinciding with that of anaphors in the strict sense. Bound pronouns are not generally taken to be in this class, although the term 'anaphora' may be used to refer to bound pronouns as well ('bound variable anaphora').

7. I use the term 'pronoun' in the restricted sense of a variable referential element that is not locally bound (the term 'pronominal' is used elsewhere). Reinhart and Reuland (1993) take reflexives (Dutch *zich*) to be nonreferential pronouns rather than anaphors. This view of reflexives is not adopted here.

8. An element is 'bound' if there is a binder for it, i.e. an element that c-commands it and corefers with it. An element is 'free' if it is not bound.

9. A projection is created by the mind on the impulse of sensory data or thought processes. The linguistic entities that have referential properties are taken not to refer to real world entities directly, but to projections (which may or may not be based on real world entities).

10. See Jayaseelan (1997) for extensive discussion of the idea that anaphors are modified pronouns.

11. The classical inventory derives its charm mainly from the circumstance that it covers both overt and covert categories. However, traces are currently no longer viewed as separate entities from their antecedents, but as copies of their antecedents. Hence, they can be of any noun phrase type, regardless the type of movement. Also, the idea that PRO is a pronominal anaphor has been contentious from the start (see Koster 1984). See Zwart (1999b) for the idea that PRO stands out as a nonreferential element.

12. Reinhart and Reuland (1993, p. 659) describe pronouns as being less referentially defective than anaphors. For our purpose, the crucial distinction is between fully referential elements (R-expressions) and variable referential elements (pronouns and anaphors), regardless the ability of pronouns to stand on their own in a given discourse setting or by virtue of some process of accommodation. That anaphors are variable referential rather than nonreferential is shown by various tests, discussed in Zwart (1999b), showing different behavior of anaphors compared to reflexives or PRO. For example, in (i), the anaphor, but not the reflexive, allows an interpretation where Sally is listening to a recording of her own speech (Rooryck and VandenWyngaerd 1998), and in (ii) the anaphor allows a 'de re' interpretation, unlike PRO (cf. Chierchia 1989):

(i) Sally hoorde zich/zichzelf praten (Dutch)
Sally heard SE/SE-SELF talk
(ii) The unfortunate expects himself/PRO to get a medal

13. The view on spell-out and the role of the Lexicon here is inspired by the framework of Distributed Morphology of Halle and Marantz (1993), and more generally by recent approaches which assume a morphology-after-syntax approach. In such an approach, the spell-out procedure takes a syntactic terminal and converts it into a string of phonemes. The module performing the conversion, called Morphology, yields a form from the (paradigms stored in the) Lexicon that best matches the morphosyntactic features present on the terminal. The approach to binding explored here assumes that the Lexicon contains paradigms of pronouns, that anaphoricity is a pronominal feature which may be acquired in the course of a derivation and prompts Morphology to yield an anaphor when encountered on a terminal node in the spell-out procedure. Note that coreferentiality on this approach is not introduced at LF by an interpretive procedure, but is already present as a syntactic feature, acquired by the PRONOUN in a sisterhood configuration with its antecedent. As pointed out by the editors, this is compatible with the notion, entertained in DASR and in Chomsky (2001b), of continuous communication between the computational system (syntax) and the interface components LF and PF.

14. Cf. Postma's (1997, 303) discussion of similar cases, where he argues that the semantic bleaching needed to turn a referential expression into an anaphor is not an inherent lexical property but a function of syntactic structure.

15. To be more exact, the proposal made here does not necessarily imply that anaphoricity should be marked on the PRONOUN rather than on the antecedent. A cursory glance at anaphoricity across languages suggests that the entire range of possibilities is attested: anaphoricity marking on the PRONOUN (English), on the antecedent (i), on both the PRONOUN and the antecedent (ii), and on neither (iii):

(i) Irail pein duhp-irail (Ponapean, Rehg 1981, 301)
they self bath-them
'They bathed themselves.'

(ii) Ada wiči wič alzurar-zawa (Lezgian, Haspelmath 1993, 186)
he-ERG self-ERG self-ABS deceive-IMPF
'He is deceiving himself.'

(iii) Nrâ dreghe nrî fadre rroto (Tiri, Osumi 1995, 207)
he-SUBJ injure he-OBJ with car
'He injured himself in a car.'

16. More precisely, *John* is neither a variable referential element, nor does it contain a variable referential element, as is the case with inalienable possessive (body part) noun phrases used as anaphoric expressions.

17. Note that in the version of Kayne's theory advanced here, *he* would have to be spelled out as an anaphor if its coreferentiality with *John* were to derive from the circumstance that *he* and *John* form a constituent like in (26). This alone would suffice to exclude the sentences in (24) on the relevant reading.

18. See also Heim (1998) for a recent discussion of these facts. Heim introduces the useful notion of a 'guise', an individual concept, i.e. a function from worlds to individuals, and proposes that reference is always to a guise. Binding principles B and C can then be reformulated as prohibiting (local) coreference to the same guise. Heim does not, however, propose to describe all cases of accidental coreference as reference of identical noun phrases to different guises. A solution along these lines might be feasible for the examples in (27), for instance, if discourse new elements (elements in focus) are taken to refer to a different guise/projection than (identical) discourse old elements (elements lending themselves to ellipsis). In (27), the first instance of *John* is in focus, whereas the second is deaccented, showing discourse old status. See Demirdache (1997) for relevant discussion.

19. It seems to me that the curious exception to Principle C in (i), discussed in Fiengo and May (1994, 265), Fox (1995), and Zwart (1998b), must also be described with reference to focusing and defocusing effects.

(i) I gave him everything John wanted me to (give him)

Here, *him* and *John* may be understood as coreferring, in violation of Principle C. In Zwart (1998b), I suggested that the overt *him* is (for its interpretation) parasitic on the elliptical *him* in the part in parentheses, which itself, being deaccented, is introduced as discourse old. In terms of Tancredi (1992), there is a 'focus related topic' *give someone something* which allows *give him* to be deaccented and even deleted. At the same time, the overt *him* is of necessity

interpreted as identical to the elliptical *him*, yielding accidental coreference of the overt *him* and *John*. In my present view, the phenomena are slightly more complicated, because the interpretation of the elliptical *him* can now no longer be viewed as an instance of coreference (which is restricted to anaphors), for which see below.

20. Demirdache (1997, 75) argues that Principle C should not be understood as prohibiting accidental coreference, but as excluding an anaphoric interpretation of accidental coreference. Thus in (27a), although *John* may like *John*, the information that John is a 'self-liker' is not conveyed. In our theory, the anaphoric interpretation is automatically excluded because *John* is not a variable referential element.

21. In earlier work (Zwart 1999a), I proposed to derive Principle C effects, and absence thereof in non-c-commanding configurations, from a reference assignment procedure working in tandem with the operation Merge, to the effect that every noun phrase newly merged to the structure is contraindexed to (referential) noun phrases already in the structure. This essentially incorporates Lasnik's (1976) obviation principle, a precursor to Principle C. I now believe that the strongest implementation of the derivational approach to binding should eliminate Principle C altogether, and should not involve any mechanism of reference assignment other than the mechanism yielding coreference discussed here.

22. Number is not an issue here, witness the equally ungrammatical (i):

(i) The boys heard the girls curse themselves.

23. Note that the uniqueness requirement does not exclude recursive anaphoricity, as in:

(i) John heard himself curse himself.

As pointed out by Kayne (2000), the derivation of examples like (i) may involve a constituent like (ii), where *John himself* is first extracted from XP, and *John* is then extracted out of YP:

(ii) $[_{XP}\ [_{YP}$ John himself] himself]

24. Interarboreal operations have been proposed as a solution to the problem that head movement typically violates the extension condition (Bobaljik and Brown 1997). In Zwart (2001) I suggest a different approach to this problem, namely to abandon the idea that head movement (feature movement) involves adjunction.

25. I take English *himself* inside representational noun phrases like *pictures of himself* to be logophors rather than anaphors (cf. Reinhart and Reuland 1993, 681f.). If so, the impossibility of A-movement out of representational noun phrases illustrated in (i) does not affect the noted paralellism of anaphor binding and A-movement.

(i) * John seems that [pictures of <John>] are on sale

26. Although this assumption looks familiar from the perspective of the Government and Binding theory (Chomsky 1981), it is actually a novel assumption which requires further support. The Case Filter of the Government and Binding theory applies to all noun phrases, but does not exclude escape mechanisms, such as default or inherent Case assignment, which might be applied to the antecedent in (21) as well. In addition, the Government and Binding theory does not require every *noun phrase*, but every *argument* to acquire a thematic role.

27. A-positions are defined here as positions where thematic roles and (structural) Cases may be assigned.

28. In English, Exceptional Casemarking (ECM) constructions (*John saw Bill kiss Mary*) do not obviously involve NP-raising into the functional domain associated with the matrix verb (*pace* Johnson 1991), unless the raising takes place at LF (Branigan 1992) or involves the entire VP (Koster 2000). In the classical Government and Binding theory analysis, the extension of the local domain for A-movement and binding in ECM constructions was described as a function of government of the embedded subject by the higher verb (cf. Chomsky 1981, 188). In the minimalist framework, the local domain can no longer be defined with recourse to the notion 'government'.

29. This may be derived from the idea expressed in Chomsky (2001a) that interpretation takes place in phases, where CP constitutes a phase.

30. Cases like (i) are excluded because *John*, extracted from the noun phrase headed by *himself* lacks a thematic role and a Case.

(i) * John, himself likes Mary

31. The abbreviations used in the glosses are: DEM = demonstrative, NNTR = nonneuter, AFF = affirmative. See Zwart (1998a) for a comparison of Dutch and English left dislocation constructions.

32. Kayne (2000, this volume) does not appear to start from the assumption that the derivation starts out with a generic variable referential element PRONOUN, which is spelled out either as an anaphor or as a pronoun.

33. Absolutive anaphors are widely attested, both in the pronominal variant (e.g. Lezgian, Haspelmath 1993, p. 184f) and in the inalienable possessive noun phrase variant (e.g. Basque, Saltarelli 1988, p. 104).

34. Nominative-accusative languages with nominative objects, such as Icelandic, deserve additional comment. In Icelandic, nominative anaphors are excluded in object position as well (Everaert 1990, 281), including the object position occupied by embedded external arguments in ECM constructions (Schütze 1997, 119). I leave this subject for further study. One possibility is that the dative subject typically required in these constructions is contained within a preposition phrase (PP) headed by an empty preposition. Being inside a PP, the dative subject could not originate as a sister to the PRONOUN, eliminating the only possible source of coreference in our approach.

35. Note that nominative 'long distance anaphors' (not bound inside the L-domain) are widely attested (see Jayaseelan 1997 for a survey). This leads me to believe that long distance anaphors are not anaphors in the sense defined here, i.e. PRONOUNs merged with their antecedent. That long distance anaphors are not true anaphors is supported by the distribution of the long distance anaphor *taan* in Malayalam, which cannot be bound locally, as shown in (i)-(ii) (data from Jayaseelan 1997, 190f).

(i) taan waliya aaḷ aaṇə ennə raaman-ə toonni Malayalam
self great person is COMP Raaman-DAT seemed
'It seemed to Raman that he (sc. Raman) was a great man.'

(ii) * raaman tan-ne aṭiccu
Raman self-ACC hit-PAST
'Raman hit himself.'

36. The modal particle *al* facilitates the interpretation of the verb *zien* 'see' as 'imagine', which is the necessary interpretation if the ECM-subject is *zich* rather than *zichzelf*.

37. Hence the development of the SE-reflexive into a grammaticalized reflexivity marker in many languages, e.g. Norwegian.

38. It is tempting to consider the construction in (i) as resulting from movement of the antecedent and the floating quantifier out of the noun phrase headed by *the other*. However, as (ii) shows, the locality conditions on A-movement are not met, suggesting that a different analysis applies to these cases.

(i) The boys each hated the other
(ii) The boys each knew that I hated the other

39. Crucially, the creator of the pictures in (61) may be different from the persons indicated by *they*, so that we know that *each other* is not bound by an empty *pro* subject.

40. Other languages do, like Dutch (anaphor *zichzelf*, logophor *'mzelf*) and Malayalam (anaphor *tanne-tanne*, logophor *tanne* (ACC)).

41. Languages featuring weak and strong pronoun paradigms must use the weak paradigm (including the empty pronoun *pro*) when a bound reading is intended (Montalbetti 1984). But crucially, weak pronouns are not used *exclusively* in bound readings.

42. The relevance of (a weak version of) c-command to bound variable anaphora (i.e. the pronoun must be bound by its antecedent or by a noun phrase referentially dependent on its antecedent) suggests that the antecedent (or a noun phrase referentially dependent on the antecedent) must be merged to a constituent containing the pronoun for a bound variable anaphora interpretation to obtain. This can be udnerstood if the pair-list reading characteristic of bound variable anaphora (i.e. *every x thinks x is a genius* is interpreted as x_1 *thinks* x_1 *is a genius,* x_2 *thinks* x_2 *is a genius, etc.*) requires merger of two elements involving some kind of multiplicity. The quantified noun phrase is inherently multiplicitous, and its sister can be interpreted as such if it contains a multiplicitous element, such as a variably (i.e. non-deictically) interpreted pronoun. (As shown by Higginbotham 1980, the pair-list reading disappears when the pronoun is interpreted deictically in examples like *Every musician will play some piece that you ask him to play*.) If so, bound variable anaphora requires a configuration like (1a), but in a different way from true anaphor binding.

43. Following Lasnik (1998), I assume that the complement/adjunct asymmetry often noted in connection with this type of anti-reconstruction effects (cf. Lebeaux 1988) is spurious.

44. Note that the presence of a *pro* subject in the fronted (representational) noun phrases is irrelevant in the crucial case of (74a), as *Diana* is not the author of the stories (Heycock 1995, note 15).

45. In introducing discourse familiarity, I deviate from Heycock's (1995) explanation of the pattern in (74). Heycock (1995, 561) proposes to represent nonreferential noun phrases at LF as involving a split between a fronted part (*how many*) and a reconstructed part (*stories about Diana*), explaining the Principle C effect through c-command at LF. She shows that *how many*-phrases also permit a referential interpretation where the entire *how many*-phrase is interpreted in the fronted position at LF. On this interpretation, *how many stories about Diana* asks for the cardinality of a given set of stories about Diana. Again, the notion 'given' appears to be crucial here, and, in our view, sufficient to facilitate an (accidental) coreferential reading. The observation in Fox (1999, 166) that effected objects (of a verb like *build*) trigger a nonreferential interpretation and hence reconstruction effects, whereas non-effected objects (of a verb like *rebuild*) do not, again supports the significance of the notion 'given' in this domain:

(i) How many houses in John's city does he want the government to (re)build? (obviation only with *build*)

46. The relevance of deaccenting to coreference was noted as early as Lakoff (1968), Akmajian and Jackendoff (1970).

47. Lebeaux's conclusions are adopted in Epstein et al. (1998, 62), albeit that in their approach communication between syntax and LF is continuous. Hence, Principle A must be satisfied at any point in the derivation, whereas Principle B/C must be satisfied throughout the derivation.

48. Branigan (2000) argues in support of binding effects created by covert movement on the basis of examples like (i):

(i) Perry proved [Jill and Tony to have lied] during each other's trials

The argument assumes covert movement of the ECM 'subject' *Jill and Tony* to an object licensing position c-commanding *each other*, a movement established overtly in languages like Dutch (cf. (34)). But the argument begs the question whether such covert movement exists (on which see Koster 2000), and whether *each other* in (i) is a 'true' rather than a logophoric or even pronominal reciprocal.

49. This eliminates the possibility that a constituent [John himself] is merged in the embedded clause and raises to the adjunct position, after which *John* is extracted and merged in the matrix clause subject position. In such a derivation, *John* would not be interpreted as the external argument of the predicate, but *John himself* would.

50. *Pace* Martin 1996, 112.

51. As discussed by Torrego (1996), McGinnis (1998) and Ura (2000), languages seem to differ as to whether the experiencer blocks raising. In Dutch, no blocking effect occurs, but, interestingly, reflexive experiencers appear to be excluded with raising verbs (i), unlike with nonraising verbs of appearance (ii):

(i) Jan lijkt mij/??zich(zelf) een genie te zijn (Dutch)
John seems me/SE(self) a genius to be
'John seems to me/himself to be a genius.'
(ii) Jan komt mij/zichzelf voor een genie te zijn

John comes me/himself fore a genius to be
'John appears to me/himself to be a genius.'