Deriving Condition A[*]

Glyn Hicks

Department of Language and Linguistic Science
University of York

Abstract

This paper advances a reinterpretation of Condition A of the classical binding theory. This approach, based on the application of operations in the computational component of the grammar, is consistent with the methodological constraints imposed by the Minimalist Programme (Chomsky 1993, 1995b), and crucially makes use of the theory of computational operations outlined in arguably its most successful implementation to date (Chomsky 2000, 2001). It is suggested that, provided certain assumptions can be made concerning the feature specification of anaphors, Condition A is entirely reducible to an operation of feature-agreement, a conclusion which has intriguing implications for the theory of syntactically active feature types in the current framework. Furthermore, the previously stipulated local binding domain ('governing category') is correctly predicted to correspond to the 'phase', the core syntactic domain employed in recent versions of Minimalism. The analysis is extended to capture some problematic empirical phenomena in English, including the behaviour of anaphors embedded within complex DPs ('picture-DPs').

1   Introduction

It is well known that even the most fundamental theoretical principles upon which the classical binding theory is based are simply unstatable under Minimalist assumptions. In this paper, I propose a treatment of Condition A of the binding theory which is argued

to overcome the theoretical constraints imposed by Minimalism. The goal, therefore, is primarily a theoretical one. The first of the obstacles encountered is the long-standing 'domain problem'. While the precise definition of the local domain relevant for Conditions A and B[1] has long been a subject of debate within the generative literature, a far deeper problem underlies any Minimalist treatment of the local domain. Essentially, the framework must reject construction-specific constraints, deriving them from the interaction of lexical properties with deeper underlying grammatical principles. In the case of the local domain for anaphors, this is overcome through the observation that binding domains coincide closely with the single generalised derivational domain employed in the Minimalist framework of Chomsky (2000, 2001, 2004), namely the PHASE.

In light of this observation, predictions about the application of Condition A can be made, leading to a resolution of the 'encoding problem', that is, how anaphor binding operates syntactically. With the addition of a single feature to the featural specification of anaphors, anaphor binding can be reduced to an application of the AGREE operation employed in the Chomsky (2000, 2001, 2004) framework. If anaphor binding is determined during the course of the syntactic computation ('narrow syntax'), this approach also overcomes the 'level problem': the disagreement — or at least lack of consensus — concerning the level(s) of representation at which Condition A applies. This problem is brought into yet sharper focus by the Minimalist conjecture (Chomsky 1993) that LF is the only relevant level at which binding relations are evaluated, given the proposed elimination of D-structure and S-structure. It has remained unclear until now how best to deal with the empirical facts previously explained by the proposed relevance of D-structure, S-structure, and LF to the different binding conditions. The approach developed here can be understood as a reinterpretation of Belletti and Rizzi's (1988) insight that Condition A may apply at any of the levels of representation (in the GB framework): this is derived and further constrained by the Agree-based explanation for anaphor binding.

Certain anaphor binding environments are then observed where the local domain for an anaphor apparently extends beyond the phase. I treat these cases, by and large, as instances not of true anaphors, but of homophonous DPs which bear a different feature set (essentially, that of pronouns). Pragmatic and syntactic properties particular to these 'nonlocal' anaphors are adduced in favour of a treatment separate to that of locally bound anaphors. Finally, the same diagnostics are applied to cases where anaphors are embedded inside complex DPs, notably including 'picture-DPs', a long-problematic empirical phenomenon.

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[1]I refer to the 'local (binding) domain' rather than 'governing category' as a more neutral term in a framework without government.

2 Condition A as agreement

2.1 Modelling a new binding theory

It is well known that the advent of the Minimalist Programme (Chomsky 1993, 1995b; Chomsky and Lasnik 1993) eliminates many of the mechanisms required by the classical Principles and Parameters (P&P) binding theory (e.g. indexation, government), and by eschewing representational filters, renders the very specification of the binding conditions untenable. Three theoretical problems at the heart of the binding theory become immediately apparent:

The encoding problem: How is binding encoded in a derivational framework without recourse to representational filters? Furthermore, the Inclusiveness condition (Chomsky 1995b) rules out the possibility of encoding coreference relations through indexation, banning the introduction during the course of the syntactic computation of objects not present in the lexical array.

The domain problem: A redefinition of the local binding domain is clearly required, since the previously crucial theoretical concepts of government and accessible SUBJECT, for example, are eliminated as non-primitive concepts which do not meet 'virtual conceptual necessity'.

The level problem: Where do the binding conditions apply? If S-structure and D-structure are eliminated from core grammar, the LF interface can be the only candidate. Yet previously, D-structure, S-structure, and LF have all been required in order to explain the full range of empirical binding facts.

Issues concerning the relevant domains, encoding, and levels of representation have, of course, long been central to research into the binding theory (see, e.g., Harbert 1995), and even the most successful responses to such matters still proved controversial in the Government and Binding framework. However, if we follow Chomsky's view that Minimalism should primarily be treated as a research programme, rather than simply a particular syntactic framework, parsimony requirements impose a particular methodology in resolving the issues sketched above. Minimalism forbids us both from assuming an independent module of the grammar responsible for binding, and from introducing ad hoc binding-specific theoretical concepts to resolve the three broad issues outlined above. The ideal, then, is to derive a theory of binding purely from principles independently required in the syntactic framework. Failing that, we may carefully introduce new concepts or principles, provided that they broadly satisfy Occam's Razor, arising out of 'virtual conceptual necessity'. If this line of inquiry fails, the case for a Minimalist framework of assumptions is weakened.

In response to the encoding problem, two broad approaches have emerged from Minimalist research into binding. First, as initially proposed by Chomsky (1993); Chomsky and Lasnik (1993), binding relations may be understood as the result of a set of LF-interpretive procedures (binding conditions). Alternatively, it is suggested by Gamon (1996); Epstein, Groat, Kawashima, and Kitahara (1998); Hornstein (2000); Kayne (2002); Zwart (2002) that binding is determined by processes operating in the narrow-syntax. From a theoretical perspective, it is noteworthy that the derivational establishment of binding relations appears to be the only one capable of reconciling anaphor binding with movement. Since Chomsky (1973), the classical binding theory has envisaged a single explanation for the shared properties of binding and movement (e.g. c-commanding antecedents, locality constraints). In this respect, Chomsky (1993); Chomsky and Lasnik (1993) abandon one of the leading insights of generative syntax, which I take to be a shortcoming of their approach. Any analysis with aspirations of retaining some version of this 'uniformity' (Koster 1997) must ideally assume that binding shares significant properties with movement. Since movement must be considered a narrow-syntactic process,[2] in the absence of evidence to the contrary, it is natural to assume that binding also is. If locality constraints on movement are imposed by properties of the narrow-syntactic computation, then only the derivational approach to binding will offer any scope for a unified explanation of the two phenomena: if the general motivation for locality in syntactic relations derives from requirements imposed by economy of computation, there is little reason to suppose that any particular domain should play some role independently at LF.

2.2   Encoding binding relations through features

Restricting our attention to anaphors, if binding takes place during the derivation, then the question is how. In the framework developed by Chomsky (2000, 2001, 2004), all syntactic dependencies are established through a meta-relation, Agree. Agree does not operate freely, hence all narrow-syntactic dependencies must be triggered. If anaphor binding could be reduced to an application of Agree, the encoding problem would be resolved without modification of the framework. Intuitively, Agree seems an appealing way of encoding anaphor binding relations, since an anaphor typically shares the φ-features and reference of its antecedent. This appears to be the intuition behind the derivational account for binding facts proposed by Kayne (2002) (and developed by Zwart 2002; Heinat 2003), though under different assumptions. Essentially, a pronoun or anaphor and its antecedent enter the derivation as a complex DP (i.e. they merge, as in (1)),[3] internally to which a local (specifier-head) agreement operation ensures coreference between the

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[2]Although Chomsky (2001) suggests that head-movement may apply in the phonological component.

[3]Zwart (2002) suggests that only anaphors merge inside complex DPs.

two elements. At a later stage of the derivation, the antecedent moves from its position within the complex into a θ-position in order to acquire a θ-role.

(1)   [$_{DP}$ [$_{DP}$ John] [$_{D}$ him(self)]]

Even aside from the empirical predictions, such an analysis faces theoretical difficulties in the framework of assumptions I adopt here. Notably, Kayne's analysis crucially assumes a version of movement theory and θ-theory based on Hornstein (1999, 2000), contrary to the θ-theoretic assumptions of Hale and Keyser (1993) based upon which Chomsky (2000) argues that movement into θ-positions is illegal (the θ-theoretic principle). Furthermore, it is unclear what selectional property of an anaphor or pronoun motivates the merger of the antecedent.

If we wish to retain one of the intuitions behind Kayne's approach, namely that binding is instantiated through the application of agreement between an anaphor or pronoun and its antecedent,[4] the various problems are most simply overcome by adopting the assumptions of Chomsky (2000, 2001, 2004). In this framework, the core operation Agree applies at 'long-distance' between the feature-sets of two lexical items. Thus, syntactic dependencies can be established without recourse to antecedent-pronoun complex DPs. Notably, this approach offers a new conception of uniformity between binding and movement. In the Chomsky (2000, 2001, 2004) framework, agreement is dissociated from movement, whose role is thereby greatly reduced. The application of Agree between two categories is a prerequisite for movement of one into the specifier of another; displacement is simply the consequence of an EPP-feature on the agreement probe, requiring its specifier to be filled. The dissociation of movement from agreement ensures that locality constraints on movement are reinterpreted as constraints on agreement.

If, as proposed here, there is scope for encoding binding relations in terms of an agreement operation, we must turn our attention to the mechanisms of this agreement. Agree operates between features, assumed to be attribute-value pairs. Features of lexical items with a particular attribute either bear a corresponding value upon entering the derivation, or they do not. A valueless features is uninterpretable at the interfaces (by the principle of Full Interpretation) and so must enter into a syntactic dependency during the course of the derivation capable of valuing it. Agree is the only operation capable of valuing features. As valued features (i.e. interpretable features, prefixed i-, e.g. [$i\varphi$]) do not need to enter into any syntactic dependency in order to make them legitimate interface objects, only unvalued features (i.e. uninterpretable, prefixed u-) act as the trigger, or probe, for Agree. Probes search within a computationally accessible c-command domain for a 'matching' feature with the same attribute, but which bears a value. Only in this generalised 'probe-goal' configuration under matching can Agree

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[4]Chomsky and Lasnik (1993:553) suggest that 'it is plausible to regard the relation between a reflexive and its antecedent as involving agreement'.

operate. The operation copies the value of the valued feature onto that of the valueless one, creating an interpretable interface object.[5]

If local binding is reducible to agreement between an antecedent and an anaphor, then we must assume that one must enter the derivation with a particular feature valued, and the other with a matching feature unvalued. We start out by examining how far we can go with the features already available to us. Under standard assumptions, DPs bear a valued φ-feature set, $[i\varphi]$, and an unvalued Case feature $[u\text{Case}]$, to be valued during the derivation. However, it soon becomes apparent that an Agree-based account of anaphor binding involving these features alone cannot be articulated. First, Case-feature agreement cannot be responsible for binding, since there is of course no requirement that an anaphor bear the same Case value as its antecedent. Second, it can be shown that $[\varphi]$ both on anaphors and their antecedents has to be valued upon entering the derivation. Anaphors in object positions can clearly value the $[u\varphi]$ probe on v, just as referential DPs and pronouns in subject positions value $[u\varphi]$ on T: it must be assumed that anaphors bear $[i\varphi]$, just like referential DPs. Since Agree may not operate between two valued features (as a unvalued feature must act as the trigger for Agree), φ-feature agreement cannot be responsible for binding. Finally, even if a system of φ-feature agreement between anaphors and their antecedents were theoretically plausible, we would predict simply that the two φ-feature values should be identical, but nothing more; clearly, though, the relation that an anaphor enters into with its antecedent is one of *referential* dependency.

We need to assume that additional features are involved in this agreement. Furthermore, in order that the features are not entirely ad hoc, they must either have some morphological or semantic basis. Let's recap what we know about anaphors in comparison with pronouns and referential DPs, which can act as their antecedents. Anaphors are obligatorily parasitic upon the reference of their antecedent. Therefore, these are good candidates for bearing an uninterpretable (unvalued) version of some unidentified feature, for two reasons: first, they are in some sense inherently 'defective', and second, the requirement for an antecedent is obligatory, resulting in a derivation crash if there is none available. Pronouns, on the other hand, may take an antecedent, but do not need to. They are, like DPs, referentially independent. Pronouns and referential DPs are therefore good candidates for bearing an interpretable (valued) version of the unidentified feature. This is reminiscent of the same split in the featural specification of DPs that Reinhart and Reuland (1993) propose, based on referential independence, or the ability of a DP to pick out a discourse antecedent. Hence, referential DPs and pronouns bear [+R], anaphors bear [-R]. A similar approach is taken by McGinnis (1998), who also proposes an 'R' feature encoding referentiality on DPs. McGinnis suggests that the R-feature of a referential DP, for example, must be copied onto an anaphor in the course of

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[5]This is not the whole story in the Chomsky (2000, 2001, 2004) framework. Certain important details are omitted here for simplicity, while issues relating to them are addressed fully in §3 below.

the derivation, though there is little explanation of how this is achieved. Clearly, this sort of feature — which, as required, ties a semantic characteristic of different types of DP to their syntactic behaviour — is just the sort of thing we need to pursue an agreement-based approach to anaphor binding. It only remains to identify the relevant feature. We may assume that this feature encodes certain aspects of the reference of a DP, so we call this feature [REF].[6]

If we continue to assume that features of lexical items are attribute-value pairs, a question immediately arises concerning the possible values of the feature [REF]. We might speculate, albeit tentatively, that [REF] serves to mediate between DPs and their denotations with respect to a particular model. If this is the case, then the feature value may simply be an integer, corresponding to the indices of pre-Minimalism approaches to binding. This offers a solution to the problems posed by the adoption of the Inclusiveness Condition. DPs can now be assumed to enter the derivation with limited information about their referents; essentially, enough to relate them as disjoint or intersecting in reference with other DPs in the same numeration. Anaphors enter the derivation with no such information, but in order to receive a semantic interpretation, must receive one during the course of the derivation.[7]

We have now largely overcome the encoding problem with respect to anaphor binding. The relationship binding an anaphor to its antecedent is the valuation of [uREF], through a narrow-syntactic Agree operation which serves to copy the value of [REF] on the antecedent (a referential DP or pronoun) onto the anaphor. Given this approach, specific empirical predictions are made concerning the distribution of anaphors and their antecedents, and we may therefore envisage a new resolution for the domain problem.

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[6]It is likely that this feature will turn out to be somewhat simplistic, since quantified DPs and *wh*-phrases act as binders, but are not strictly referential. Though clearly important, the precise characterisation of this feature is not crucial for the arguments I wish to develop here, hence for expository purposes I continue to use [REF], leaving the precise articulation of referentiality-encoding features for future research.

[7]It should be noted that Chomsky (1995b) appears to warn against such an approach to indices:

> With sufficiently rich formal devices (say, set theory) counterparts to any object (nodes, bars, indices, etc.) can be readily constructed from features. There is no essential difference, then, between admitting new kinds of objects and allowing richer use of formal devices; we assume that these (basically equivalent) options are permitted only when forced by the empirical properties of language.

> (Chomsky 1995b:381, fn.7)

2.3   Implications for the domain problem

The reduction of anaphor binding to narrow-syntactic agreement predicts that the constraints on the locality of the antecedent to the anaphor follow simply from those governing the locality of all agreement operations. Locality of agreement in the Chomsky (2000, 2001, 2004) framework is constrained by the nature of the computational component, which proceeds incrementally in PHASES. In the clausal architecture, phases are commonly assumed to correspond to every CP and transitive vP. I assume below that other constituents are phases, too, but we put aside these concerns for the moment. As the derivation reaches each phase-level, the operation Spell-out transfers the syntactic material within the phase to the two components (semantic and phonological) that interface with the external systems of the brain. The spelt-out material is thereby rendered inactive to any further narrow-syntactic operations, with one exception, formalised by Chomsky (2000, 2001) as the Phase Impenetrability Condition (PIC):

(2) $[\alpha$ [H β]]

(3)   *Phase Impenetrability Condition* (*PIC*)
       In phase α with head H, the domain of H is not accessible to operations
       outside α, only H and its edge [its specifier(s)] are accessible to such
       operations.
       (Chomsky 2000:108)

Essentially, only the syntactic material at the edge of each phase (the phase head and its specifiers/adjuncts) remains accessible to the immediately higher phase.[8] If anaphor binding is indeed determined by Agree, the locality constraints on anaphor binding should simply reduce to the PIC. The agreement approach to Condition A therefore envisages a response to the domain problem (at least for anaphors), if the local binding domain can indeed be reduced to the phase. Given this prediction, we must now carefully examine the empirical facts.

2.3.1   Empirical evidence for the local domain

Though the possibility that the local binding domain might be reduced to the phase has been largely overlooked in the recent literature, it is not an entirely new suggestion. Heinat (2003), following the Distributed Morphology framework, assumes that the morphology of a pronoun is not determined upon selection, but upon Spell-out. Heinat extends the analyses of Kayne (2002) and Zwart (2002), assuming that coreference must be determined upon merger in a complex DP.[9] The pronoun/anaphor merged with an antecedent is a generic form, its morphology to be determined upon Spell-out. For Heinat,

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[8]The PIC is modified subtly in Chomsky (2001).

[9]Certain criticisms of this approach are levelled in §2.2, and apply here too.

phases are crucial in determining the morphological form of the pronominal: as long as phases are spelt-out as the complements of phase heads (VP and TP),[10] if the two are spelt-out in the same phase, the pronoun has the morphological form of an anaphor. Heinat in fact only discusses a few cases where the theory makes the correct predictions, and unusual assumptions are required. For example, he assumes the following derivation, which, if the pronoun is spelt-out in the vP edge along with all the material as high as TP, correctly predicts the morphological form of the anaphor (*herself*):

(4)   [$_{CP}$ Mary likes [$_{v}$P [[Mary$_{copy}$] PRONOUN] [$_{v}$P ...

(Heinat 2003)

This is an unusual derivation, even aside from the complex DP. First, the verb raises to a position outside vP. Second, the object (morphologically realised as *herself*) is spelt-out in Spec$v$P. On the more natural assumption that objects do not move, the generalisation does not hold, since the antecedent and generic pronominal are then spelt-out in separate phases. Additionally, if the moment of Spell-out is crucial, and phonologically unrealised copies do not spell-out, then it is unclear how the system could deal with the cases where the antecedent is a *wh*-phrase, which escapes Spell-out until several phases of the derivation later:

(5)   [$_{CP}$ who$_i$ did Mary [$_{v}$P t″ think [$_{CP}$ t′ [$_{v}$P t shot himself$_i$ in the foot]]]]

An alternative approach to phase-based local binding is proposed by Lee-Schoenfeld (2004). She examines binding possibilities in German, with particular attention paid to AcI (Accusativus cum Infinitivo) constructions. Lee-Schoenfeld also concludes that reflexives must be bound within their minimal phase, while pronouns must be free in their minimal phase. Like Heinat (2003), Lee-Schoenfeld assumes that a phase is defined as the portion of the derivation that spells-out as a unit in the Chomsky (2001) system (i.e. the complement of phase heads, e.g. TP and VP). Edge-positions in CP and vP must in fact constitute part of the immediately higher phase. While this is not implausible, the analysis requires that a DP in an edge-position must be able to bind an anaphor in the lower edge, so as Lee-Schoenfeld concedes, a paradoxical situation arises whereby in some sense the phase-edge belongs to two phases at once.

While I agree that it is a desirable outcome that the binding domain reduces to the only syntactic domain of any relevance under Minimalist assumptions, only an explanation based on the application of Agree has much hope of explaining *why* the phase should be the relevant domain for anaphors. Yet Heinat follows the Kayne (2002) approach to determining coreference, and Lee-Schoenfeld follows Chomsky (1993); Chomsky and Lasnik (1993); Baltin (2003) in 'relegating' the binding conditions to an evaluative procedure

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[10]See, e.g., Boeckx and Grohmann (2004) for discussion.

at LF. Essentially, only an Agree-based account explains the violation of Full Interpretation if an antecedent is not found before the anaphor itself is rendered inaccessible to further narrow-syntactic operations by being spelt-out.

I therefore continue to pursue the phase-based agreement approach, examining its compatibility with empirical evidence from English. Like the approaches of Heinat (2003) and Lee-Schoenfeld (2004), the Agree-based analysis of local binding broadly predicts that an antecedent must occur within the same phase as an anaphor. We start with some of the central data that the classical Condition A accounts for:

(6) a. [$_{TP}$ John$_i$ [$_{vP}$ <John$_i$> likes [$_{VP}$ himself$_i$]]]

 b. *[$_{TP}$ John$_i$ [$_{vP}$ <John$_i$> said [$_{CP}$ Mary [$_{vP}$ <Mary> likes [$_{VP}$ himself$_i$]]]]]

In the analysis developed in this section, the position of the phonologically null 'copies' created by movement is argued to play a crucial role, and hence the relevant ones are indicated in the structural representations, in angled brackets.[11] The anaphor in (6a) enters the derivation in the vP phase. Crucially, since the antecedent *John* for the anaphor merges within that phase (in Spec$v$P), *John*'s [iREF] feature will potentially be able to value the anaphor's [uREF] before completion of the vP phase, as required. Furthermore, in (6b), where the antecedent *John* does not enter the derivation within the same vP phase as the anaphor, the locality requirement is not satisfied, as predicted: at the minimal vP phase containing *himself*, the anaphor is inaccessible to further operations by the PIC.

2.3.2 Binding in non-finite clauses

A central issue in binding theory since the very earliest incarnations has been the effect of non-finite tense in determining binding domains, for example in raising and control constructions such as (7a) and (7b) respectively:

(7) a. I$_i$ tried [$_{CP}$ PRO$_i$ to free myself$_i$]

 b. John$_i$ seems [$_{TP}$ t$_i$ to have freed himself$_i$]

The prima facie problem posed by such constructions is that the antecedent for the anaphors surfaces in the matrix clause, not in the embedded clause which contains the anaphor. Classical GB accounts typically responded to this empirical challenge by extending the local domain to include the matrix clause, hence allowing the matrix subject to act as a local antecedent. However, the system of anaphor binding being pursued is considerably stricter in its requirements: not only must the anaphor be in the same clause as the antecedent, it must be in the same phase.[12]

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[11]Freidin (1997) also argues that copies must be relevant to binding theory on the Minimalist assumption that D-structure and S-structure have no place in the grammar.

[12]Though in cases where the clause is non-phasal, i.e. a bare TP, we predict that anaphors may be bound outside their clause (but within their phase). This prediction is borne out, as shown below.

I suggest that the derivational account for Condition A now comes into its own, indicating that even in these constructions the phase is the relevant local domain. In (7a), I assume that PRO is in fact an antecedent for *myself*, as of course, the two corefer: given that the PRO subject enters the derivation in the embedded vP phase, agreement can operate internally to the vP phase before Spell-out renders the anaphor *myself* inaccessible to the computation:

(8)   [TP I_i [$_{v}$P <I_i> tried [CP PRO_i to [$_{v}$P <PRO_i> free [VP myself_i]]]]]

Since we assume that anaphor binding operates during the derivation, the fact that the antecedent for the anaphor moves out of its phase at a later stage of the derivation is immaterial. The agreement operation which ensures coreference applies directly after the merger of the antecedent, before it undergoes subsequent movement. It is entirely natural to assume that PRO may bind an anaphor, since this is of course a property of overt pronouns, too. Moreover, such an assumption seems to be required independently to account for the acceptability of sentences like (9), where (arbitrary) PRO is the only possible binder for *oneself*:[13]

(9)   PRO_i to get oneself_i arrested is unadvisable

The raising construction in (7b) is also straightforwardly explained without extending the binding domain. If, as standardly assumed, the subject of a raising construction moves from a θ-position in the embedded clause, it must enter the derivation within the vP phase containing the anaphor:

(10)   [TP John_i [$_{v}$P seems [TP <John_i> to have [$_{v}$P <John_i> freed [VP himself_i]]]]]

We conclude that standard cases of raising and control present no threat to the agreement-based approach to Condition A effects. Indeed, the reduction of Condition A to an application of Agree reveals that anaphor binding in these constructions is determined in more local configurations than previously imagined. Imposing a far stricter locality requirement on anaphor binding presumably results in the grammar being considered more computationally efficient than previous Principles and Parameters approaches, a welcome result.

ECM constructions have also long posed a problem for the binding theory. We assume, standardly, that the subject of an ECM complement clause in (11a) enters the derivation within the embedded vP, as in (11b):

(11)   a.   John_i believes himself_i to love Mary

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[13]A question arises concerning the feature specification of PRO. Here, I assume that PRO must bear [iREF], conceding that it is not uncontroversial that PRO should be considered fully referential and that an explanation of how PRO is related referentially to its controller must remain for now beyond the present scope.

b.   John$_i$ [$_{v}$P <John$_i$> believes [$_{TP}$ himself$_i$ to [$_{v}$P <himself$_i$> love Mary]]]

The putative problem for the proposal that an anaphor must be able to find an antecedent within the same phase is that in (11b), no antecedent is available within the vP phase where the anaphor enters the derivation. However, this generalisation is simply a descriptive statement of the empirical facts we have seen so far, deriving from the requirement imposed by bare output conditions that an anaphor not be interpreted with an unvalued feature. If a derivational Agree-based approach is on the right lines, then the application of Agree between the antecedent and anaphor must be subject to the same conditions as those on other operations. In this case, the position in which the anaphor enters the derivation is crucial. Agentive subjects merge in Spec$v$P, a phase-edge position. It is predicted that upon completion of the vP phase, the derivation in (11b) does not crash, since the material in the edge of vP remains computationally accessible in the immediately higher phase, as stated in the PIC. Just as the unvalued Case feature of a subject in Spec$v$P does not crash the derivation provided that it is valued in the immediately higher phase, an anaphoric subject in Spec$v$P with its [uREF] unvalued does not crash the derivation, provided that [uREF] can be valued in the immediately higher phase. This is precisely the case in ECM constructions. The anaphor moves into SpecTP of the embedded clause, and now must find an antecedent by the time that phase completes. As the ECM complement is a TP and not a CP (as has been assumed since Chomsky 1981), the ECM clause does not constitute a phase: the next phase boundary occurs at vP in the matrix clause. The correct prediction of the Agree-based approach to Condition A, therefore, is that an antecedent for an anaphor which is an ECM-subject must enter the derivation before completion of the matrix vP phase.

3   Theoretical problems for the agreement approach

We have seen so far that an account for anaphor binding based on agreement offers an explanation for the three central problems for the binding theory on Minimalist assumptions. Anaphor binding is syntactically encoded as an application of Agree in the narrow syntax, which — for the data examined thus far — correctly predicts that the phase is the local domain for anaphor binding. The traditional generative goal of linking constraints on binding and movement receives a natural implementation: though anaphor binding and movement are separate syntactic phenomena, phase-based computation imposes similar requirements of locality on each. Other theoretical advantages are observed. Since the properties of anaphor binding are simply reduced to those imposed on all feature-agreement operations by Full Interpretation at the interfaces, Condition A as an independent grammatical principle is eliminated from the grammar, an ideal result from a reductionist perspective. Further, a far stricter locality requirement governs

anaphor binding, particularly in non-finite clauses, another welcome result. This Agree-based approach is extended below, but it is important to note that certain theoretical difficulties arise in the detail of the system of anaphor binding under development. I argue below that the required modifications to the framework of assumptions are not theoretically costly.

3.1 LF-uninterpretability of features valued by Agree

A fundamental problem lies in the very system of agreement we use to overcome the encoding problem. Chomsky (2000, 2001, 2004) assumes that syntactic operations are driven by morphosyntactic features. We have assumed that morphosyntactic features are attribute-value pairs that may enter the derivation either valued or unvalued. For Chomsky, those which enter the derivation valued are interpretable at LF, e.g. φ-features on D, tense features on T. Those which enter the derivation unvalued, e.g. Case features on D, are uninterpretable at LF and therefore trigger an agreement operation with a valued version of a matching feature on another category, which serves to value the uninterpretable feature. While the valuation of an unvalued feature has consequences for PF, any feature valued during the derivation by Agree remains uninterpreted at LF, being deleted from the LF representation by the Spell-out operation. Although the idea of 'valuing' the [uREF] of an anaphor by agreement with a matching interpretable feature seems intuitively appealing, it is in fact incompatible with the system proposed by Chomsky (2001), since valuation is only relevant for the PF interface: the particular feature value affects only phonological interpretation. The approach I have developed thus far appears to require that after valuing, the anaphor's [REF] is not deleted.

There are independent reasons to suppose that Chomsky's assumptions may be suspect. A problem with this approach to morphosyntactic features, as noted by Chomsky (2001); Epstein and Seely (2002); Legate (2002), is that once an LF-uninterpretable feature is valued during the derivation, it is indistinguishable from a feature which entered the derivation valued; the distinction is of course crucial, since only the latter is sent to LF. This is part of the motivation for Chomsky's (2001) adoption of the cyclic application of Spell-out: if Spell-out operates shortly after feature valuation, it can 'remember' that the relevant feature was previously unvalued and hence strip it from the portion of the derivation transferred to the semantic component. However, Epstein and Seely argue that the logical approach is that at *any* stage after feature valuation has taken place (whether 'shortly' after or not), the two types of valued feature are indistinguishable. Additionally, Legate (2002) also outlines general problems with the idea that features which enter the derivation valued are semantically interpretable, arguing that φ-features on D, for example, are not necessarily semantically interpreted.[14] Legate argues for a

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[14]Due to the appearance of non-semantic noun class markers in certain languages, for example.

different approach to the split in feature types: morphosyntactic features drive syntactic operations but are not semantically interpreted, while semantic features are interpreted but play no syntactic or morphological role. As Legate shows, this resolves the problem of the irretrievable distinction between interpretable and valued uninterpretable features raised by Epstein and Seely: the matter simply does not arise, since no morphosyntactic features are transferred to the semantic component. Thus, unvalued features can only crash the derivation at the PF interface, not at LF.

An alternative approach to the problem of Spell-out's 'derivational memory', along the lines suggested by Legate, is to suppose that all valued features are interpreted, whether valued upon lexical selection from the numeration or during the derivation. We could imagine two conceptual reasons for this. First, one might well question the role and status of a feature whose derivational aim is to be eliminated, effectively a 'virus', to use Uriagereka's term. As Martin (1999:19) observes, 'insofar as we think that C_{HL} [the computational procedure] may be perfect or optimal in some serious sense, the existence of features not interpreted by interface systems is surprising'. Second, the Chomsky system requires significant disparity between the two post-syntactic halves of the Y-model, with no explanation as to why features valued during the course of the derivation are illegitimate LF-objects but required at PF. Moreover, Chomsky's initial proposal was that only morphosyntactic features are syntactically active during the derivation. More recently, evidence has been provided these 'morphosyntactic' features entering into agreement operations in the computational component seem to have a rather semanticosyntactic flavour; see, e.g., Adger and Ramchand (2003); Butler (2004).

Given this, we might envisage a more symmetrical model. Imagine that the features which drive the narrow-syntactic derivation may either be associated with semanticosyntactic interpretation, or with morphosyntactic interpretation. Just as previously assumed, some enter the derivation valued, some unvalued. The aim of an unvalued feature is to make itself a legitimate interface object, since all features must be valued in order to be legible at the interfaces, and feature valuation works in the usual way, by Agree. All features, whether valued or unvalued upon entering the derivation, are interpreted, either at PF, or at LF.[15] It is logically possible that certain features are interpreted by both interfaces, though impossible that a feature be interpreted by neither.

This system has notable implications for Case theory. In the Chomsky (2001) system, the fact that only features which enter the derivation valued are interpretable at LF is designed to capture the semantic vacuity of structural Case, which is assumed never to be semantically interpretable on any head. DPs therefore bear unvalued Case features which cannot be valued by probing for a matching interpretable feature, since Case is never

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[15]This is reminiscent of Frampton and Gutmann's (2000) analysis of Agree as an operation of feature-sharing rather than feature-deletion, with the features involved in agreement 'coalescing' into a single shared feature.

semantically interpretable. Instead, Chomsky (2001) suggests (following George and Kornfilt 1981) that Case is valued as a reflex of a φ-feature agreement operation between a DP bearing $[u\text{Case}, i\varphi]$ and a Case-assigning head bearing $[u\varphi]$. Under the revised system of feature interpretability advanced here, there is no requirement that features be both semantically and phonologically interpreted: if Case is a purely morphosyntactic feature (i.e. interpreted only by PF), there is no expectation that it should be semantically contentful, and so we can eliminate the stipulation of the exceptional agreement of Case features. I assume that a head bearing $[u\varphi]$, such as T, also bears $[i\text{Case}]$. These two features participate in agreement with D, which bears $[i\varphi]$ and $[u\text{Case}]$.[16]

This theory of features at the interfaces is somewhat reminiscent of that advanced by Chomsky (1995a), whereby the Spell-out operation transfers only the relevant types of feature to each of the phonological and semantic components. Nunes (1995) argues for such an approach on the grounds of economy, since deletion is assumed to be a 'costly' operation (unlike Merge, for example), and there is no need for deletion of the 'wrong' type of feature at each interface. Though a disadvantage of this approach is that it requires some elaboration of the Spell-out operation, I believe that it results in a far simpler and less stipulative approach to features in narrow syntax. Returning to the issue at hand, the proposed system of anaphor binding via Agree is compatible with the revised system of feature valuation. The [REF] feature on pronouns and referential DPs is valued upon entering the derivation, while on anaphors [REF] is unvalued. Therefore, unless an anaphor's [REF] enters into agreement with a valued feature of the same type on a referential DP or pronoun (resulting in coreference), the derivation will not converge, since an unvalued $[u\text{REF}]$ feature is an illegitimate object at LF by Full Interpretation.

3.2 Probe-goal agreement

A second problem concerning the legitimacy of the agreement operation between anaphors and their antecedents is the apparent incompatibility with the configurational requirements of probe-goal agreement. The system of agreement advanced in Chomsky (2000, 2001) assumes that unvalued features, upon entering the derivation, probe within their c-command domain for an appropriate goal bearing a matching set of valued features. Crucially, the c-commanding probe must always be a u-feature, and the goal an i-feature, yet the anaphor binding configuration involves $[i\text{REF}]$ on the antecedent apparently probing in its c-command domain for a $[u\text{REF}]$ goal. The only way that the [REF]-agreement operation can satisfy the current requirements of probe-goal agreement is if some addi-

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[16]Given the system developed so far, we could now dissociate φ-feature agreement from Case valuation altogether, since the system no longer forces φ-feature agreement as a prerequisite for Case-valuation; see §3.2 below. It is possible, then, that different heads bear $[u\varphi]$ and $[i\text{Case}]$, for example, though I do not pursue this possibility here.

See Branigan (2005); McFadden (2004) for alternative proposals for Case within a Minimalist setting.

tional unvalued feature on the antecedent acts as the probe for the operation. Yet it is entirely unclear what such a feature (unvalued on antecedents but valued on anaphors) could be identified as. Moreover, not only is the motivation for the feature purely theory-internal, but its presence on the relevant DPs would also need to be stipulated. DPs would only be permitted to bear the probing feature if an anaphor were available to value it, since otherwise the derivation would crash wherever a DP does not act as the antecedent of an anaphor.

Suppose we continue to assume that features enter the derivation either valued or unvalued, and agreement serves to value an unvalued feature in order for it to become a legitimate interface object. We also accept that this agreement must operate internally to a phase, given the cyclic application of Spell-out. If Spell-out indeed applies cyclically, these assumptions appear to be required by the constraints imposed by bare output conditions. However, it does not follow that an uninterpretable feature must necessarily be valued from below; indeed, as suggested in §3.1, valuation takes place from above in Case-assignment, for example, where the DP bearing an unvalued Case-feature is in the c-command domain of the Case-assigner. If we dissociate φ-feature agreement from Case-assignment operations, then we have two separate applications of Agree between a Case-assigner and a DP: one valuing the φ-features from below, the other valuing a Case-feature from above.

(12) $[\; ... \; T_{[u\varphi,i\text{Case}]} \; ... \; DP_{[i\varphi,u\text{Case}]} \;]$
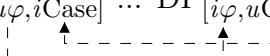
The following approach to feature agreement emerges. At the point where we merge a head bearing an unvalued feature, the head probes its c-command domain for a matching valued feature. If it finds an appropriate feature, Agree operates, valuing the probing feature. In the case where the probe does not find such a feature, it must simply wait until a c-commanding category capable of valuing it merges.

We can now see how this modified approach to Agree predicts the valuation of anaphors' $[u\text{REF}]$ by their antecedents. Imagine that the D head of an anaphor, bearing $[u\text{REF}]$, merges with the rest of the structure of that DP, i.e. a possibly phonologically null NP.[17] $[u\text{REF}]$ on D probes within its c-command domain (into NP), obviously un-successfully. From here, the anaphor's $[u\text{REF}]$ must rely on valuation from above. At the stage when a (sufficiently local) referential DP merges, its $[i\text{REF}]$ is visible to the anaphor's matching feature, and Agree operates.

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[17]Perhaps, as first suggested by Postal (1966), *self* can be instead analysed as an N in English reflexives, with a pronoun as the D head.

4   Binding at longer distance

We have seen above that in several syntactic environments, the local binding domain for anaphors corresponds to the phase, as predicted by an Agree-based version of Condition A. However, the picture is complicated by the fact that in certain environments in English, anaphors may apparently find an antecedent outside their normal binding domain. Clearly, how we deal with these cases will be crucial to the account of anaphor binding outlined above: if these longer distance anaphors must be treated in the same way as those we have seen so far, we must explain why Agree can operate across larger portions of the derivation than usually assumed. However, the properties of the binding relation between antecedent and 'nonlocally bound' anaphors differ from the properties of local binding. These properties help us in trying to draw a distinction between cases of local anaphor binding and cases involving pronouns that are simply homophonous with anaphors. This brings the local binding theory's domain of application into sharper focus, and allows some fresh observations to be made about some old problems, such as picture-DPs, and non-complementarity between anaphors and pronouns.

4.1   Some anaphors are more equal than others

We may preface the discussion of anaphors which do not show the usual sensitivity to Condition A by stating that there must be some DPs which have the morphological form of reflexives but which cannot be true anaphors, there being no coreferent DP in the sentence:

(13)   a.   What about yourself?

b.   Both John and myself knew the answer but didn't dare say it.

c.   No-one misbehaved, myself excepted.

Reinhart and Reuland (1993) term these 'logophoric' reflexives. The use of such reflexives is clearly subject to individual and dialectal variation. Southern Hiberno-English, for example, permits reflexives which appear with no antecedent far more freely than most British dialects (Siobhán Cottell, p.c.). Interestingly, while most British dialects do not permit even logophoric reflexives in finite subject positions, this is not true of Southern Hiberno-English:

(14)   Did himself go out last night?

We may assume, then, that at least some DPs with the morphological appearance of anaphors must have the featural specification of pronouns, that is, they do not bear [uREF] upon entering the derivation and therefore do not require a local antecedent. It is less clear how to deal with anaphors which do have an antecedent, but which do not

appear to satisfy the usual requirements of locality.[18]

(15)   a.   John$_i$ and Mary$_j$ thought [$_{CP}$ that there were [$_{DP}$ some pictures of each other$_{i+j}$/themselves$_{i+j}$] for sale on ebay]

         b.   John$_i$ and Mary$_j$ thought [$_{CP}$ that [$_{DP}$ some pictures of each other$_{i+j}$/themselves$_{i+j}$] were destroyed in the fire]

         c.   John$_i$ and Mary$_j$ both bought strychnine [$_{CP}$ for each other$_{i+j}$ to kill pigeons with]

In (15a), the anaphor is embedded inside a 'picture-DP' associated with an expletive subject, and its minimal phase is the CP embedded clause.[19] The antecedent does not enter the derivation until the vP phase of the matrix clause. Similarly, in (15b) the anaphor is embedded inside a 'picture-DP' which is the subject of the embedded CP, while the antecedent does not enter the derivation until the matrix vP phase. In (15c), the embedded subject is simply an anaphor, again apparently bound across a CP phase boundary.

As a starting point, we may take Lebeaux's (1984) observation that certain syntactic properties distinguish cases of local binding from nonlocal binding. Dealing only with reflexives, Lebeaux notes that four characteristics typically distinguish local binding from nonlocal binding. First, only nonlocal binding permits split antecedents for an anaphor:

(16)   a.   John$_i$ told Mary$_j$ [$_{CP}$ that there were [$_{DP}$ some pictures of themselves$_{i+j}$] for sale on ebay]

         b.   * John$_i$ told Mary$_j$ about themselves$_{i+j}$

Second, the requirement that an antecedent c-command an anaphor only holds of local binding:

(17)   a.   John's$_i$ success depended on [$_{CP}$[$_{DP}$ every picture of himself$_i$] portraying him as a hero]

         b.   * John's$_i$ mother respects himself$_i$

Third, under VP-ellipsis, nonlocally bound anaphors give rise to strict/sloppy ambiguities, unlike locally bound anaphors, which only give rise to a sloppy reading (see also Grodzinsky and Reinhart 1993; Reinhart and Reuland 1993):

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[18]For ease of exposition, in the following examples conjoined and plural DPs are annotated with separate indices for each individual, e.g. *John$_i$ and Mary$_j$, themselves$_{i+j}$*. However, I assume that these DPs in fact bear a single [REF] feature, e.g. [$_{DP}$[REF:k] John and Mary]. See Fiengo and May (1994:38-45) for discussion and an alternative view.

[19]This position is revised below.

(18)   a.   John$_i$ thought there were some pictures of himself$_i$ on ebay, and Bill did too

             = pictures of John, or = pictures of Bill

      b.   John$_i$ respects himself$_i$, and Bill does too

             = respects Bill, but $\neq$ respects John

Finally, nonlocally bound anaphors are apparently in free variation with pronouns. Compare (18a) with (19):

(19)   John$_i$ thought there were some pictures of him$_i$ on ebay, and Bill did too

As Lebeaux notes, each of the properties of nonlocally bound anaphors is shared with pronouns, which permit split antecedents, do not require a c-commanding antecedent, and exhibit strict/sloppy ambiguities under ellipsis. It would appear, then, that just as for the logophoric reflexives which do not require an antecedent in the same sentence, nonlocally bound reflexives are best treated as pronouns, which enter the derivation with a valued [iREF]. However, before we go any further we should examine whether nonlocally bound reciprocals also exhibit the same properties as nonlocally bound reflexives.[20] With respect to the property of taking split antecedents, no possible interpretation can be assigned to the relevant sentences:

(20)   a.   * Bush$_i$ told Kerry$_j$ [$_{CP}$ that there were [$_{DP}$ some pictures of each other$_{i+j}$] sold to every major network]

      b.   * Bush$_i$ asked Kerry$_j$ [$_{CP}$ whether [$_{DP}$ each other's$_{i+j}$ voters] were misinformed]

However, it seems reasonably clear that a nonlocally bound reciprocal can take an antecedent which does not c-command it.

(21)   a.   (?) [$_{TP}$[$_{DP}$ Bush$_i$ and Kerry$_j$'s success] required that each other's$_{i+j}$ voters not show up on election day]

      b.   (?) [$_{TP}$[$_{DP}$ Bush$_i$ and Kerry$_j$'s campaigns] required that each other$_{i+j}$ not make a TV appearance on election day][21]

Under VP-ellipsis, though the sloppy reading is overwhelmingly preferred, it seems that it might be very marginally possible to get a strict reading for the nonlocally bound reciprocal:

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[20]Hornstein (2000:186) argues that nonlocally bound reciprocals do exhibit the same properties as nonlocally bound reflexives. As I show below, the judgements do not seem to me to be as clear as Hornstein would suggest.

[21]It seems that for some speakers reciprocals as finite clause sentence are ungrammatical.

(22)   (?) Bush$_i$ and Kerry$_j$ knew that pictures of each other$_{i+j}$ with their families would encourage turnout on election day, and so did Blair and Howard

= Blair and Howard know that pictures of each other with their families would encourage turnout, **or**:

= ?? Blair and Howard know that pictures of Bush and Kerry with their families would encourage turnout.

Also, nonlocally bound reciprocals are in free variation with pronouns, though due to the semantics of reciprocals, with differences in meaning:

(23)   [$_{TP}$[$_{DP}$ Bush$_i$ and Kerry$_j$'s campaigns] required that their$_{i+j}$ voters not show up on election day]

The diagnostics for nonlocal binding proposed by Lebeaux (1984) are not as robust for reciprocals, though with the exception of split antecedents can be applied nevertheless: the judgements are less clear but go in the right direction. In trying to examine whether the local domain for anaphor binding corresponds to the phase, the problem is that we must filter out cases where an apparent anaphor is nonlocally bound by an antecedent, since by their feature specification, nonlocally bound anaphors must be treated essentially as pronouns. We can achieve this by examining various contexts where the binding domain of an anaphor appears to extend beyond the phase, and employing Lebeaux's diagnostics for local binding.

4.2   Teasing apart local and nonlocal binding configurations

So far we have seen the following environments in which nonlocal binding holds, that is, a DP homophonous with a true anaphor is not subject to the normal requirements of anaphor binding.

(24)   **antecedent** ... [$_{CP}$ *there was* [$_{DP}$ *picture of* **anaphor**] ...] e.g. (15a), (16a).

(25)   **antecedent** ... [$_{CP}$[$_{TP}$[$_{DP}$ *picture of* **anaphor**] ...]] e.g. (15b), (17a).

(26)   **antecedent** ... [$_{CP}$[$_{TP}$[$_{DP}$ **anaphor**] ...]] e.g. (15c), (21b).

(27)   **antecedent** ... [$_{CP}$[$_{TP}$[$_{DP}$ **anaphor***'s* NP] ...]] e.g. (21a).

¿From these abstract structural representations we can generalise that binding across CP (a phase) has nonlocal properties and that the system we have developed above for anaphor binding is not brought into play. This is what the Agree-based approach predicts, since by the PIC Agree should not be permitted between an element in a higher phase (here, an antecedent) and one in the domain of the immediately lower phase (an anaphor). However, a finer-grained analysis reveals possible complications, which have important consequences for certain empirical phenomena associated with anaphor binding.

4.2.1 Non-binding-theoretic constraints on reflexives

It should first be noted that the representations (26) and (27) are only applicable to reciprocals, not to reflexives. It is well known that reciprocals and reflexives exhibit distributional differences in English, in particular with respect to their occurrence in subject positions, as observed by Lebeaux (1983):

(28) a. ?? John and Mary think that each other will win

     b. * John thinks that himself will win

(29) a.   John and Mary brought some friends for each other to meet

     b. ?? John would like some friends for himself to meet

(30) a.   John and Mary like each other's parents

     b. * John likes himself's parents

(Examples and judgements from Lebeaux 1983)

As seems natural in light of the data, Lebeaux argues that reflexives must be subject to a principle beyond Condition A, distinguishing them from reciprocals. Generalising that the subject position of tensed clauses, the subject of a *for-to* infinitival, and the subject of an NP are all positions which are not properly governed, and given that the requirement for proper government is essentially the Empty Category Principle (ECP), Lebeaux argues that reflexives, but not reciprocals, are subject to the ECP. This is derived through an analysis whereby reflexives undergo movement at LF,[22] leaving an empty ungoverned position, in violation of the ECP. Under updated theoretical assumptions (which do not permit use of the ECP) and an alternative analysis of anaphor binding, I speculatively suggest instead that the distributional difference between reflexives and reciprocals is due to reflexives' deficient φ-feature specification, which does not allow reflexives to fully satisfy the featural requirements of the relevant agreement head.[23] Despite the overt presence of φ-features on English reflexives, further evidence from Southern Hiberno-English — which permits logophoric reflexives in subject positions — suggests that the overt φ-features on English reflexives are not those of the D head. Where logophoric reflexives occur in finite subject positions in this dialect, the verbal morphology indicates that the agreement is not with the overt φ-set on the reflexive but with some default φ-set. For singular reflexives the verbal agreement is always for third person singular, regardless of the person of the reflexive.

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[22]A version of the LF-movement analysis is later adopted by Chomsky (1986, 1993).

[23]Since reflexives can be objects, we must therefore also assume that there is no abstract object agreement in English, an assumption which the revised approach to feature-agreement outlined in §3.1 allows us to articulate (see note 16). If φ-feature agreement is not a prerequisite for Case valuation, then v bearing [Case: ACC] could potentially value [uCase] on an object without the object bearing a full φ-feature set, for example. Alternatively, we might assume that full φ-feature agreement is not required for abstract object agreement; see note 24.

(31)   Is/*are yourself going out tonight?

While the internal structure of anaphors is left as a matter for future debate, my tentative conjecture is that Southern Hiberno-English reflexives may occur in subject positions because in this variety, the D head of the reflexive receives a default φ-feature set, while the φ-set on Standard English anaphors is incomplete.[24] Reciprocals, on the other hand, would be assumed assumed to bear a full φ-feature set, explaining their appearance in the three types of subject positions where Standard English blocks reflexives.

4.2.2   Binding into a picture-DP across a clause boundary

Another complication is the possibility of analysing subjectless picture-DPs as containing a PRO subject, as in Chomsky (1986). If subjectless picture-DPs in fact contain a PRO subject, then the possibility arises that the reflexives above, which are assumed to be nonlocally bound, are in fact locally bound by PRO, as in (32):

(32)   John$_i$ thought that there were [PRO$_i$ pictures of himself$_i$]

The reflexive could then be treated as locally bound, strictly speaking, while the 'long distance' properties of the anaphor follow independently from PRO's (long distance) relationship to its controller.

Conceding that such an analysis might be possible in certain cases, Lebeaux (1984) argues that at least not all of the instances of nonlocal binding of anaphors within picture-DPs can be explained in this way. Lebeaux claims that the interpretation predicted by the analysis in (32) is simply not observed, since the pictures do not have to have been taken by, or belong to, John. However, it seems that at least for some speakers, that interpretation *is* strongly favoured. An additional argument against the structure in (32) is that DPs with possessive or agentive subjects are always definite, and as such are ungrammatical as the associate of the expletive *there* due to the definiteness restriction on this construction:

(33)   There are [some/several/∅ pictures of Lee Trundle] on every Swansea City fan's wall

(34)   * There are [the/John's/someone's pictures of Lee Trundle] on every Swansea City fan's wall

Even with an indefinite subject such as *someone's* in (34), the containing DP is always definite.[25] If PRO were to indeed occur in the DP-internal subject position in (32), we

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[24]It is possible that just the Person feature is absent in Standard English, with the default specification [PERS: 3] on Southern Hiberno-English reflexives responsible for the distributional difference.

[25]Intriguingly, some speakers feel that the indefinite subject in particular is more or less acceptable in (34), which is not predicted by standard explanations for the definiteness effect. I have no explanation for this.

would predict that like (34), a definiteness effect should render the sentence ungrammatical. A crucial question is whether DPs with possessors or agents are obligatorily definite for syntactic or semantic reasons. If the reason is syntactic, we might assume that it is just Case that rules out possessors in indefinite DPs, i.e. indefinite D's are incapable of valuing the Case feature of a DP-internal subject. PRO may appear in this position, though, since its Case requirements (if indeed PRO does even have Case) differ from those of overt DPs. If so, then we might be able to overcome the objection to the PRO-subject analysis of picture-DPs.

However, in cases not involving subjectless picture-DPs such as (28a), (29a), and (30a), binding of reciprocals appears to take place at equally long distance, yet there can be no PRO subject assumed to locally bind the reciprocal. Since these anaphors must be nonlocally bound, there is no real empirical or theoretical value in assuming the presence of a PRO subject locally binding the anaphor in the other cases.[26] Though we can entertain the possibility that some of the cases of apparently long-distance binding involving reflexives or reciprocals embedded within a subjectless picture-DP may be structurally ambiguous between local and nonlocal binding configurations, I assume for simplicity that none of these cases involve local binding by PRO.

4.2.3   Binding into a picture-DP within a clause

The abstract structural representations in (24) and (25) show that binding across a CP phase boundary into a subjectless picture-DP has the properties of nonlocal binding, which we have treated as not involving any sort of agreement operation between the two coreferent DPs. This is what the Agree-based approach to anaphor binding predicts, since agreement across a CP phase should be ruled out. We have not yet considered the properties of binding into picture-DPs where a CP phase boundary does not intervene between the antecedent and anaphor, e.g. (35):

(35) $John_i$ likes pictures of $himself_i$

In other words, since we are trying to determine the extent of the local binding domain, we do not yet know whether it is the fact that the reflexive or reciprocal is not bound within CP which results in the nonlocal binding properties, or whether is it simply that the reflexive or reciprocal is not bound within a smaller domain, the picture-DP. Though we have not yet seen cases where the local binding domain is not a CP or vP but a DP, independent empirical facts force us to extend our analysis of phase-based binding in order to explain cases such as the following:[27]

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[26]Further, as both of the possible structures appear to give rise to the properties of nonlocal binding, we have little scope for teasing apart the two separate structures.

[27]As reported by Asudeh and Keller (2001); Keller and Asudeh (2001); Runner (2003), it appears that for some speakers, examples such as (36) are grammatical on both readings for the anaphor. I have no

(36) $[_{TP}$ John$_i$ $[_{vP}$ <John$_i$> likes $[_{DP}$ Bill's$_j$ pictures of himself$_{*i/j}$]]]

Comparing (35) with (36), we see that the presence of the agentive or possessive subject is crucial in determining the anaphor's binding domain. Although *John* c-commands the anaphor in its minimal vP in (36), only *Bill* can bind it. Though I return to such cases, offering them a full treatment in §4.3 below, for our current purposes of distinguishing locally bound anaphors from nonlocally bound anaphors it suffices to note that it is inescapable that DP, like CP and vP, must sometimes be the local binding domain.

Given this, and in light of the discussion above, three potential derivations could plausibly give rise to (35):

(37)   John$_{[i\text{REF}]}$ likes [pictures of himself$_{[u\text{REF}]}$]

(38)   John$_{[i\text{REF}]}$ likes [PRO$_{[i\text{REF}]}$ pictures of himself$_{[u\text{REF}]}$]

(39)   John$_{[i\text{REF}]}$ likes [pictures of himself$_{[i\text{REF}]}$]

In (37), an antecedent locally binds an anaphor, and the anaphor's binding domain is assumed to be vP. Given the blocking effect induced by a DP-internal subject as in (36), we would subsequently have to assume that DP only acts as an anaphor's local binding domain when it contains a subject, as in the canonical GB approach. Alternatively, if we were to imagine that all picture-DPs — with or without a subject — are local binding domains, we would have assume either that the reflexive inside a subjectless picture-DP is not locally bound as shown in (39) or is locally bound by a PRO subject as shown in (38).

If the reflexive is obligatorily a true anaphor, then it will exhibit none of Lebeaux's (1984) properties of nonlocal binding. First, we examine whether the reflexive may accept a split antecedent.

(40)   a.   Bush$_i$ showed Kerry$_j$ every picture of themselves$_{i+j}$ (together)

       b.   *? Bush$_i$ told Kerry$_j$ a story/rumour/lie about themselves$_{i+j}$

While (40a) seems grammatical, other types of DP assumed to be in the class of picture-DPs show a significant contrast, as in (40b). With respect to the possibility of a non-c-commanding antecedent, the anaphor also exhibits properties of nonlocal binding, though again, not in all cases.

(41)   a.   Max's$_i$ eyes watched eagerly a new picture of himself$_i$ in the paper

                                       (Reinhart and Reuland 1991)

       b.   * Bush's$_i$ opponents spread malicious rumours about himself$_i$ involving pretzels

explanation for this at present.

Under VP ellipsis, it again appears that reflexives can sometimes exhibit properties of nonlocal binding, giving rise to strict/sloppy ambiguities.

(42) a. Bush wouldn't show the reporters pictures of himself in a pretzel factory, but Kerry would

= show the reporters pictures of Bush, or = show the reporters pictures of Kerry

b. Bush told every reporter embarrassing stories about himself, and Kerry did too

= tell stories about Kerry, but $\neq$ tell stories about Bush

Finally, comparing (43) with (35), the reflexive is in free variation with pronouns, consistent with an analysis as a nonlocally bound anaphor.[28]

(43) John$_i$ likes pictures of him$_i$

The empirical properties of nonlocal binding, it seems, are not as clear cut as in cases of binding across a clause boundary into a DP. Though for each test we have at least some evidence that clause-internal binding into a subjectless picture-DP should be treated as nonlocal binding, given that certain sentences do not show the relevant properties, the picture is inconclusive. It appears that in this context, something is interfering with the locality tests. Here, we again raise the question of PRO subjects in apparently subjectless picture-DPs. Bhatt and Pancheva (2001) suggest that in cases where the matrix verb's semantics require the DP-subject to corefer with its agent, a PRO subject is obligatorily present:[29] This assumes the following structure:

(44) a. David$_i$ told Victoria$_j$ [$_{DP}$ PRO$_i$ stories (about himself$_i$)]
      b. David$_i$ sold Victoria$_j$ [$_{DP}$ PRO$_i$ pictures (of himself$_i$)]

When there is no such requirement that an implicit DP-internal subject corefer with the subject of the matrix verb, Bhatt and Pancheva assume that PRO may be optional or perhaps in fact always absent. This predicts:

(45) a. David$_i$ heard [$_{DP}$ stories (about himself$_i$)]
      b. David$_i$ showed Victoria$_j$ [$_{DP}$ pictures (of themselves$_i$)]

Bhatt and Pancheva's approach to PRO subjects of DPs has interesting consequences for our problem of the mixed local/nonlocal binding properties of the clause-internal binding of anaphors inside subjectless picture-DPs. The sort of predicates that require a PRO subject inside the DP to be coreferent with their agents (e.g. *tell*, *sell*) are

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[28]The grammatical status of (43) is commonly assumed in the literature, though many speakers feel a strong preference for the reflexive in this environment.

[29]A similar idea is proposed by Safir (1999:596,fn.10) for idiomatic expressions such as *take PRO pictures of.*

precisely those which are involved in the sentences which fail the tests for nonlocal binding, e.g. (40b), (41b), (42b). This is exactly what Bhatt and Pancheva's approach predicts, since the anaphor is now locally bound DP-internally by PRO. The fact that PRO is obligatorily coreferent with the agent of the matrix predicate ensures, for example, that a split antecedent is impossible.[30] In these constructions, then, we have the structural configuration in (38). Following Bhatt and Pancheva's suggestion that for the other predicates (e.g. *show*, *hear*, *like*) PRO cannot occupy the subject position of a DP allows us to tease apart the two possibilities (37) (local binding into a subjectless picture-DP) and (39) (coreference without local binding between two nonlocal DPs). The fact that these cases are the ones that exhibit the properties of nonlocal binding (e.g. (40a), (42a), (45b)) tells us that (39) should be correct.[31]

This observation has critical implications for binding theory. In each of his major revisions of the binding theory, Chomsky has maintained that the binding theory must account for anaphors in object positions of subjectless picture-DPs, yet we have seen that only a small set of these, namely those which obligatorily contain a PRO subject coreferent with the anaphor, in fact exhibit properties of local binding. The other cases, as suggested by Baltin (2003); Pollard and Sag (1992, 1994); Reinhart and Reuland (1993); Uchiumi (2004), may simply involve nonlocally bound anaphors, which we assume are in fact pronouns subject to additional pragmatic conditions. As I show shortly in §4.3, this evidence may also have crucial implications for phase-theory.

This approach to DP-internal PRO subjects in fact has other advantages over that of Chomsky (1986). In particular, for Chomsky, DP-internal PRO must be largely optional, appearing as and when required in order to meet the needs of BT. This would appear to cause difficulties for a strict version of θ-theory, since either PRO must sometimes appear despite receiving no θ-role, or PRO must sometimes not appear despite the nominal predicate having an appropriate θ-role to discharge. The alternative is multiple subcategorisations in the lexical entry of nominal predicates, another unappealing solution. Bhatt and Pancheva's (2001) approach to DP-internal PRO subjects, which

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[30]Jonny Butler (p.c.) points out to me that while (40b) is ungrammatical, additional contextual information can improve the sentence, e.g.:

(i)   Bush$_i$ told Kerry$_j$ a rumour about themselves$_{i+j}$ that he'd read in *The News of The World* that morning

This is predicted under the current approach. Here, the typical x_i *told* y_k [*a PRO$_i$ rumour*] structure is overridden by the additional contextual information supplied here, since if Bush read the rumour in *The News of The World*, the rumour is not his own.

[31]It is important to note that although the anaphor exhibits properties of nonlocal binding in this environment, the diagnostics are insufficient in that they cannot confirm that the relevant sentences do not have an alternative derivation in which the anaphor is locally bound, i.e. it is logically possible that these sentences are ambiguous between the two configurations (37) and (39). I capitalise on this in the extension of the analysis in §4.4.3.

appear or do not appear according to the requirements of the predicate which selects the containing DP, provides a BT-independent account for the projection of DP-internal subjects which, as we have seen, is consistent with the (non)local binding properties of anaphors in subjectless picture-DPs.

4.3 DPs as phases

We have assumed so far that CP and vP constitute phases, and supposed that the local binding domain for an anaphor is its phase, deriving this from the properties of the operation Agree (itself constrained by the cyclic Spell-out model). However, it is commonly assumed that categories other than C and v head phases. In particular, Chomsky (2001) highlights that DPs might well be considered phases, and the general tendency following Abney (1987) towards unifying the nominal and clausal architecture would also be consistent with such an approach (see Svenonius 2004 for an overview). We noted above that at least in picture-DPs with overt subjects, the local domain must not extend beyond DP, as in (36), repeated here as (46):

(46)   [$_{TP}$ John$_i$ [$_{v}$P <John$_i$> likes [$_{DP}$ Bill's$_j$ pictures of himself$_{*i/j}$]]]

It appears that we are forced to conclude that DP is a phase (at least when an overt DP-internal subject is present), since otherwise the binding domain for the anaphor would be vP, which contains (a copy of) *John*. Although this is not particularly controversial, we have seen that complications arise in cases where there is no overt subject inside the picture-DP. The more interesting fact is that all picture-DPs, regardless of whether they contain a subject or not, delimit binding domains for anaphors embedded inside them. This observation — coupled with the Agree-based theory of anaphor binding — has critical implications for phase-theory, allowing us to treat all DPs are phases.[32]

While phase-theory is commonly adopted in current Minimalist theory, it remains the subject of some controversy how to define phases (ideally, intensionally). Chomsky's (2000:106) original suggestion is that a phase is 'the closest syntactic counterpart to a proposition: either a verb phrase in which all θ-roles are assigned or a full clause including tense and force'. Chomsky (2001:43) later claims that v only heads a phase when it has 'full argument structure', as in transitive or experiencer vPs. With an intensional definition of phases yet to be established, it seems to be the case that a phase must at least contain a subject, since for Chomsky, only those vPs which project subject positions are phasal, while all CPs must contain a subject by the traditional EPP. Interestingly, this approach to phases is reminiscent of Chomsky's (1986) *complete functional complex* (CFC), a characterisation of the governing category (or local binding domain) as a minimal category such that 'all grammatical functions compatible with its

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[32]For now we restrict this to DPs with argument structure.

head are realized in it — the complements necessarily, by the projection principle, and the subject, which is optional unless required to license a predicate' (Chomsky 1986:169). Crucially, the CFC must contain a subject, so informally, if a picture-DP does not contain a subject, the binding domain extends further.

However, the evidence above suggests that this characterisation of the CFC must be incorrect for picture-DPs, since the presence of a structural subject is not in fact crucial to defining phases. Fortunately, there is a growing body of evidence suggesting that Chomsky's characterisation of phases is not entirely correct. Legate (2003) and Matushansky (2004) argue that at least passive and unaccusative vPs should also be considered phases. Legate considers several properties of Chomsky's phases, such as reconstruction for the purposes of bound variable pronouns and Condition C, showing that these properties are shared also by passive and unaccusative vPs. On the basis of scope reconstruction with negation, Sauerland (2001) also argues that A-movement targets intermediate positions in the edge of raising vPs, lending further support to the proposal that all vPs are phases regardless of the projection of a subject.[33] Finally, Matsubara (2000) details evidence for a treatment of certain types of PPs as phases (p*Ps), and clearly no subject is present within PP.

By analogy with the clausal syntax, we can now hypothesise that DPs, like CPs, are always phasal. However, this is not the whole story, since if we assume complete symmetry with clausal syntax, we assume that n (by analogy with the preverb v) also heads a phase internally to DP.[34] Carstens (2001:162) proposes that 'the highest nP in any DP is a phrase [sic. = phase], given that it constitutes the full domain of argument structure for noun phrases'. Given that T is also assumed to have a DP-internal equivalent, sometimes termed K or Num(ber),[35] this provides the following hierarchical structure of DP:

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[33]McGinnis (1999) also suggests that such a position must be available in principle. According to McGinnis, passive v's may bear an EPP-feature which may result in object DPs moving through a Spec$v$P position. Note that even if subjects of raising constructions do target the intermediate matrix Spec$v$P at the edge of a raising vP phase, the current system of binding will require no modification in order to predict the satisfaction of Condition A in (33).

(ii)   John$_i$ [$_{v}$P <John$_i$> seems to himself$_i$ [$_{TP}$ <John$_i$> to be <John$_i$> a genius]]

The anaphor enters the derivation as an argument of *seem*, and must be bound, as usual, before the current phase completes, i.e. before vP is spelt-out. *John* A-moves into Spec$v$P, where its [iREF] is visible to the anaphor's [uREF].

[34]As suggested by Carstens (2000); Radford (2000); Adger (2003); Svenonius (2004).

[35]See Carstens (2000:320,fn.4) for the different identities of this head proposed in the literature.

(47)

$$\text{DP(CP)}$$
$$\text{NumP(TP)}$$
$$n\text{P}(v\text{P})$$
$$\text{NP(VP)}$$

We assume, then, that DPs and nPs are phases. We can now show how these assumptions predict the binding facts in picture-DPs.

(48)   The children$_{[i\text{REF}]}$ heard [$_{\text{DP}}$[$_{n\text{P}}$ stories about themselves$_{[i\text{REF}]}$]]

(49)   The children told [$_{\text{DP}}$ PRO [$_{n\text{P}}$ <PRO$_{[i\text{REF}]}$> stories about themselves$_{[u\text{REF}]}$]]

In (48), we have already seen that the anaphor is effectively a pronominal, entering the derivation with its [REF] feature valued. It occurs within an nP phase which contains no argument capable of binding it, yet since the anaphor's [REF] is already valued, there is no requirement that an antecedent be found in its phase. In (49), we have seen that there is no possible analysis where the anaphor is nonlocally bound. The anaphor bears [uREF] which must be valued before completion of the current phase, nP. Assuming, following Carstens (2000), that both agents and possessors merge in specifiers of nP, PRO bearing a valued feature [iREF] enters the derivation before completion of the nP phase, and is therefore computationally accessible to the anaphor, whose [uREF] is valued upon completion of nP, as required by bare output conditions.

4.4   Remaining empirical problems

4.4.1   The subject position in DPs

Huang (1983) and Lebeaux (1983) observe that pronominal and anaphoric subjects of DPs pose a problem for the classical binding theory since they do not exhibit complementary distribution in this environment:

(50)   a.   [John and Bill]$_k$ loved [$_{\text{DP}}$ their$_k$ wives]

      b.   John$_i$ and Bill$_j$ loved [$_{\text{DP}}$ each other's$_{i+j}$ wives]

These sentences motivated a significant modification to the classical binding theory in Chomsky (1986), where it is argued (following Huang 1983) that the criteria for determining the local domain for anaphors and pronouns differ, the anaphor's local domain extending beyond that of the pronoun in cases where no potential antecedent merges locally. Though we leave aside the cases involving pronouns, the problem is the acceptability of (50b), where the anaphor is embedded within the DP, presumed now to be a phase. On the surface, this appears to be an environment which our Agree-based account

for anaphor binding might explain: if the DP-internal subject position is SpecDP, probe-goal agreement should be able to operate between the antecedent in the higher phase and the anaphor in the DP phase-edge due to the PIC.

However, there is evidence that the DP-subject does not occupy a position as high in the DP structure as SpecDP. The crucial question concerns how the DP-internal subject (whether agentive or possessive) receives its genitive Case value. Given the modifications made to the Chomsky (2001) system of feature-agreement and interpretability in §3, we assume that a DP-subject's Case-feature is valued in exactly the same way that other DPs receive Case, not strictly as a reflex of an operation of φ-feature agreement, but simply by probe-goal agreement with a head bearing a valued Case feature.[36] We assume, therefore, that DP-internal subjects bear the set $[u\text{Case},i\varphi]$, which enters into agreement with a functional head bearing $[i\text{Case},u\varphi]$. In order for the DP-internal subject to occupy SpecDP, it must have moved as the result of an agreement operation with D, resulting in genitive case valuation and EPP-triggered movement. However, other theoretical assumptions render such an approach implausible, since the head of a DP must be assumed to bear the interpretable φ-set capable of itself entering into agreement with the other functional heads T, v, etc. This system of Case-feature valuation does not, therefore, allow D to be the head which assigns genitive Case to the DP-internal subject, since it would then be required to bear both $[u\text{Case}]$ and $[i\text{Case}]$, which is clearly impossible. It is sometimes assumed (e.g. Carstens 1991) that DP-internal subjects occupy a 'mid-level' projection in DP, e.g. SpecNumP. Not only does this approach provide complete symmetry with clausal syntax (see (47)), but it is also compatible with our assumptions concerning Case and φ-feature agreement: we therefore assume that Num bears $[i\text{Case},u\varphi]$ which probes for the subject of the DP which merges within nP, assigning genitive Case and triggering movement into SpecNumP.

This view requires that 's is in fact the realisation of a particular type of Num, namely that which bears the feature set $[i\text{Case},u\varphi]$:

(51) $[_{\text{DP}} [_{\text{D}} \emptyset] [_{\text{NumP}} \text{John} [_{\text{Num}} \text{'s}] [_{n\text{P}} <\text{John}> \text{picture}]]]$

However, it is commonly assumed that 's is a D, since it occurs in complementary distribution with overt determiners:

(52)   a.   *The/*a John's picture

         b.   John's *the/*a picture

One way of following this intuition while retaining a system of DP-internal structure compatible with internal Case-assignment is to assume that DPs are in fact K(ase)Ps, containing a DP:

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[36] Although the same problem for the analysis of the subject in SpecDP arises in the standard Chomsky (2001) account.

(53)   [$_{\text{KP}}$ [$_{\text{K}}$ ∅] [$_{\text{DP}}$ John [$_{\text{D}}$'s] [$_{n\text{P}}$ <John> picture]]]

See, for example, Lamontagne and Travis (1987); Bittner and Hale (1996) for arguments in favour of treating DPs as KPs. Under this approach, the features regulating the 'external' distribution of a DP — now treated as a KP — are present on the head K, i.e. [uCase,$i\varphi$], which enter into agreement with v or T, for example.[37] D now regulates the internal syntax, and the particular D realised as 's bears [iCase,$u\varphi$], which values the [uCase] of a DP-internal subject and drives movement into SpecDP. Clearly, the main difference is between the labels of the relevant projections; I take the two analyses to be essentially equivalent for my purposes, adopting the labelling conventions of the former approach.

   A remaining question concerns the valuation of the Case feature of the complex DP. The feature-probing algorithm outlined in §3.2 — as in the Chomsky (2001) system which it replaces — states that upon entering the derivation, a category bearing an uninterpretable feature probes in its local c-command domain for a matching valued feature. Given that we assumed in §3.1 that [Case] is no different from other features and can itself probe, we assume that [uCase] on the D head of a complex DP probes in its c-command domain. In a complex DP, this domain will contain two categories bearing [iCase], that is, potential goals for the [uCase] probe:

(54)
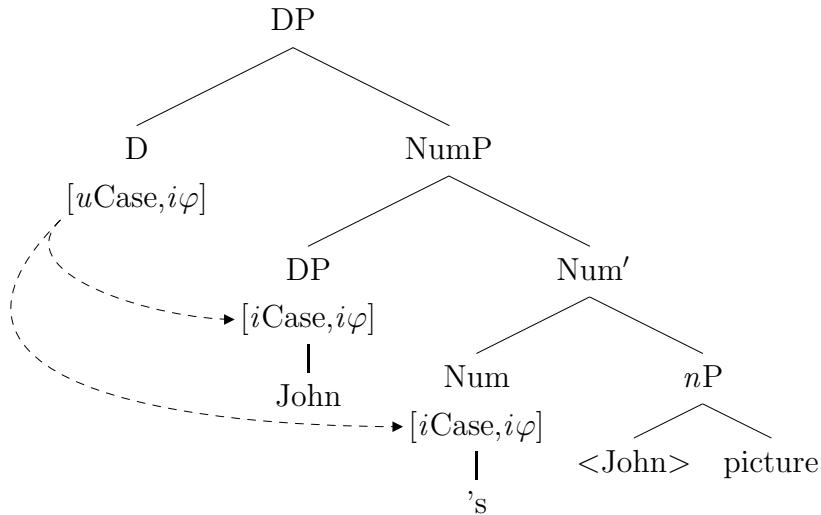
The agreement which takes place valuing the subject *John*'s [uCase] and Num's [$u\varphi$] means that when D merges with NumP, two categories in D's c-command domain bear [iCase]. We might predict that a probing [uCase] should enter into agreement with one of these categories. Yet this is clearly not what we want, since the Case value of the complex DP is not determined by agreement with an element internally to it, but by agreement with an external Case-bearing head. We need to ensure that when D's [uCase] probes, the two [iCase] features in NumP are not visible. In order to achieve this, I assume

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[37]Also, [REF] must also be present on this head, since the feature must percolate to KP, where it may potentially c-command an anaphor.

that the probing algorithm depends on a potential goal being computationally 'active', as suggested by Chomsky (2000, 2001). Essentially, a valued feature is only active for the purposes of Agree if the head which bears it also bears remaining unvalued features: informally, as soon as a head has all of its features valued, its features are inactivated since the head has no requirements of its own to satisfy.[38] Since all the requirements of 's (Num) and *John* have been met by the point in the derivation where [*u*Case] on D probes, we assume that these valued features are not computationally accessible to the probe, so [*u*Case] must probe upwardly, receiving a value from above.

As the DP-internal subject does not occur in the edge of the DP phase, under our current assumptions, in cases such as (50b) the anaphor cannot be treated as locally bound. Unfortunately, the empirical evidence, although weak, does not seem to support this position. Although we have seen above that Lebeaux's (1984) diagnostics for nonlocal binding do not apply comfortably to reciprocals, at least the c-command test is fairly robustly applicable, as shown in (21), repeated here as (55):

(55) a. (?) [$_\text{TP}$[$_\text{DP}$ Bush$_i$ and Kerry$_j$'s success] required that each other's$_{i+j}$ voters not show up on election day]

  b. (?) [$_\text{TP}$[$_\text{DP}$ Bush$_i$ and Kerry$_j$'s campaigns] required that each other$_{i+j}$ not make a TV appearance on election day]

However, when the reciprocal DP-internal subject and its antecedent are not separated by a CP-boundary, the c-command diagnostic indicates that the reciprocal is locally bound:

(56) a. * [$_\text{TP}$[$_\text{DP}$ Bush$_i$ and Kerry$_j$'s campaigns] sabotaged [$_\text{DP}$ each other's$_{i+j}$ posters]

  b. * [$_\text{TP}$[$_\text{DP}$ Bush$_i$ and Kerry$_j$'s mutual dislike] played into [$_\text{DP}$ each other's$_{i+j}$ hands]

The only reliable diagnostic that we can use in this instance appears to indicate that a reciprocal DP-internal subject is in fact locally bound, contrary to the predictions made by our Agree-based approach to local binding. Before outlining how we might analyse such cases, we first examine another problematic environment for our approach to local binding.

4.4.2 The complement of unselected prepositions

Another well known problem for the binding theory is the complement position in non-argument PPs, as in (57):

(57) John$_i$ found a snake [$_\text{PP}$ near himself$_i$]

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[38]More or less exactly the same proposal is made earlier by Gamon (1995, 1996).

If, following Matsubara (2000), we assume that such PPs are phases, the anaphor cannot be locally bound, since upon completion of PP the anaphor's unvalued [uREF] will be transferred to the semantic component and will hence be computationally inaccessible. We might imagine, again, that this is simply a nonlocally bound reflexive, yet the diagnostics for nonlocal binding again are incompatible with this view.

(58)   * John$_i$ showed Mary$_j$ a snake near themselves$_{i+j}$

(59)   * John's$_i$ mother found a snake near himself$_i$

(60)   * John$_i$ found a snake near himself$_i$, and Bill did too

        = saw a snake near Bill, $\neq$ saw a snake near John

(58) indicates that the anaphor cannot have split antecedents, and (59) shows that the antecedent must c-command the anaphor. Finally, under VP-ellipsis in (60), only the sloppy reading is available.[39] Furthermore, whereas non-locally bound anaphors are typically subject-oriented, binding into a PP by an object is just as acceptable as by a subject:

(61)   John$_i$ showed Mary$_j$ a snake [$_{PP}$ near herself$_j$]

Finally, cross-linguistic evidence also favours the treatment of binding into PPs as a case of local binding, as well as binding into the DP-internal subject position which we saw in §4.4.1 above. Unlike English, many other languages do not have nonlocally bound anaphors (pronouns) which are homophonous with true anaphors, although binding into these two positions is widespread cross-linguistically. Harbert (1983) shows cases of anaphor binding into the DP-internal subject position in Chinese and Greek, for example. Harbert also shows for Italian and (New Testament) Greek that binding takes place into adverbial PPs, as does Kiss (2001) for German.

4.4.3   Phases at LF and PF

The evidence suggests that these two environments (which have in fact long been problematic for the binding theory) involve local binding in a configuration which our current assumptions do not allow us to predict. Interestingly, another crucial cross-linguistic characteristic of anaphors in these environments is that they appear to consistently exhibit non-complementary distribution with pronouns in many languages. Though a full treatment of such cases must coincide with an analysis of Condition B effects (which I do not deal with here), I tentatively suggest the following approach. Matushansky (2004) observes that Legate's (2003) PF-diagnostics support a treatment of DPs as phasal constituents, since they are typically phonologically isolable, can be targeted by movement

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[39](58)-(60) may not all be completely ungrammatical for all speakers; my own intuition is that it might be very marginally possible to force a sloppy reading in (60).

operations, and receive phrasal stress by the Nuclear Stress Rule. However, DPs typically fail syntactic and LF-diagnostics for phase-hood. For example, there is no evidence that they host an edge-position targeted by QR or A′-movement (they cannot be conclusively shown to provide an 'escape hatch' for successive cyclic movement), and they are not obligatorily propositional. We might note here that PPs also appear to provide similarly inconsistent results for phase-hood in this respect.

As Matushansky concludes, under Chomsky's standard phase-theory it is extremely unclear how best to interpret the results of the phase-hood diagnostics when applied to DPs (and, I assume, to PPs). However, the assumption in §3.1 that Spell-out independently targets portions of the derivation for separate applications of transfer of semanticosyntactic features and of morphosyntactic features provides an intriguing possibility: that DP and PP are PF-phases, but not LF-phases, explaining why they pass PF-diagnostics for phase-hood, but fail LF-diagnostics. Suppose for example that a DP such as *each other's wives* is to be derived. At DP, a PF-phase, Spell-out transfers the morphosyntactic features within DP to PF, rendering them computationally inaccessible. However, since DP is not an LF-phase, the semanticosyntactic features of DP are not transferred to LF at this point and are therefore computationally accessible beyond DP. Therefore, as borne out by the empirical facts, the antecedent for the anaphor can enter the derivation as late as Spec$v$P, as in (62).

(62) $[_{v}$P they$_{i+j}$ loved $[_{DP}[_{NumP}$ each other's$_{i+j}$ $[_{n}$P <each other's> wives]]]

Although this is a highly speculative solution which leaves much of the detail to future research, we should note certain issues that arise under this approach. We have now developed a position in contrast to the conclusions of §4.3, where it was assumed that all DPs are phases, regardless of the projection of a DP-internal subject position. We now assume that all DPs are PF-phases and not LF-phases, also regardless of the projection of a DP-internal subject position. One question is why DPs with filled subject positions are not LF-phases, since CPs and vPs also have subjects and constitute phases by virtue of being 'propositional'. We must also assume that this extends at least to nP, which is an LF-phase when it projects a subject (following Carstens 2001, as discussed above).[40] This is required in order that the binding domain does not extend into the vP phase in cases such as (36), repeated here as (63):

(63) $[_{TP}$ John$_i$ $[_{v}$P <John$_i$> likes $[_{DP}$ Bill's$_j$ $[_{n}$P <Bill's$_j$> pictures of himself$_{*i/j}$]]]]

Here, the anaphor is embedded in an nP LF-phase, so its [uREF] must be valued upon completion of nP. *Bill*, which merges in Spec$n$P, is therefore the only available antecedent. If nP were not an LF-phase, and DP were not either, as we now assume, then the minimal LF-phase for the anaphor would be predicted to be vP, and so *John* would be a possible

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[40]We assume that nP is not a PF-phase, as Matushansky (2004) argues that there is no PF-evidence for treating any DP-internal constituent as a phase.

antecedent. This is not the case. Why DPs with filled subject positions do not constitute LF-phases remains unclear to me for now. However, if this is so, then we now expect that subjectless picture-DPs are also only PF-phases, not LF-phases. Therefore, considering that anaphors within subjectless DPs also exhibit properties of nonlocal binding, we must reanalyse these cases as ambiguous between derivations involving local and nonlocal binding (i.e. between the representations (37) and (39) in §4.2.3). Intriguingly, since this is another environment in which anaphors and pronouns are in non-complementary distribution, we see a pattern emerging: where a locally bound anaphor is free in its PF-phase but bound in its LF-phase, we observe non-complementarity between anaphors and pronouns. This goes for the object position in a subjectless DP, the subject position in DP, and the object position in an adverbial PP. The relevant generalisation seems to be, therefore, that pronouns must only be free in their minimal PF-phase, while anaphors must be bound in their LF-phase; when an antecedent occurs outside the minimal PF-phase of a particular anaphor or pronoun, but within the minimal LF-phase, either should therefore be possible. Although a treatment of locality in Condition B effects is well beyond present scope, this treatment at least provides a new angle on anaphor/pronoun non-complementarity, a long-standing problem for generative syntax.

5   Conclusion

This paper has advanced a reinterpretation of the constraints governing anaphor binding, concluding that Condition A is eliminable from the grammar without empirical loss. The initial insight is that we can eschew definitions of the local domain specific to anaphor binding, since the relevant domain turns out to be the phase, the core derivational domain employed in current Minimalist theory. While this is an important observation, highlighting that anaphor binding is determined in far more local configurations than previously imagined, this reduction can only be of purely descriptive value unless it can be explained as a consequence of the mechanisms involved in anaphor binding. To this end, we have seen that not only can the phase-theory of the recent Chomsky (2000, 2001) framework be fruitfully employed in reanalysing anaphor binding, but its feature-theory also can. The distinction between features which are unvalued upon entering the derivation, receiving a value by syntactic means, and those which are already valued upon entering the derivation corresponds elegantly to the properties of anaphors, which are referentially deficient and need to pick up a referent syntactically, and pronouns and referential DPs, which do not. All that is needed in order to formalise this correspondence is an additional syntactically active feature on DPs, which is unvalued on anaphors but valued on pronouns. Given this, we assume that the anaphor's unvalued feature is valued via the core Agree operation. This permits a complete elimination of Condition A from the grammar, an extremely appealing view from a reductionist perspective. The distribution of anaphors

is governed purely by generalised derivational operations which interact with bare output conditions on interface representations in familiar ways (i.e. Full Interpretation).

With the aim of extending the empirical scope of the Agree-based analysis of anaphor binding, we have also seen that a natural and independently motivated treatment of DPs as phases is also largely consistent with the binding data. Some complications arise in determining the local binding domain of English anaphors due to the appearance of 'nonlocally bound' anaphors homophonous with locally bound anaphors. Supported by empirical evidence, we assume that these are best treated syntactically as pronouns simply with the morphological form of anaphors. Filtering out these anaphors makes the case for phase-internal binding stronger, and leads us to the conclusion that all DPs are phases. Finally, the theoretical assumptions concerning phases, features, and Spell-out outlined in the paper are tentatively and speculatively elaborated in order to predict the acceptability of locally bound anaphors in certain DP- and PP-internal environments which have long been problematic for the binding theory, with potentially intriguing consequences for the theory of phase-based computation.

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