Perfection, Inclusiveness, and Indexation
Rethinking Binding Relations.*

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1 Introduction

This paper deals with the status of indices as devices of reference, quantification and co-reference within the restrictive set of assumptions of the minimalist programme. Because of their nature indices raise a number of questions some of them at the very basic level of theory and others more technical and implementational. I believe that the second set of issues cannot be tackled independently of the first. Therefore, I will try to address them in what i think is an apporopriate order. In section 2 I will try to

*This paper initially started as a reaction to the movement-based theories of binding in Kayne (2002) and Zwart (2002), and was presented for the first time in a talk in Stuttgart in November 2004. Very little remains from that version in this one. Development of parts of the content of that first talk also took place during a binding theory class that I taught in the summer of 2005. Again, most the directions explored there did not make it to this version. A third *version* (italics for those who were there) was presented at the LAGB in Cambridge in August 2005. Finally the closest to this version was again presented in Stutgart at the workshop on binding and reflexivity organised by Jonny Butler, who is hereby thanked for the invitation, in October 2005. For discussion on various aspects of this work I would like to thank the audiences on these occasions and more specifically, for their comments and questions: David Adger, Artemis Alexiadou, Jonny Butler, Annabel Cormack, Joe Emonds, Glyn Hicks, Kook-Hee Gil, Hans Kamp, Ruth Kempson, and Jan-Wouter Zwart. Particularly, and separately, I would like to thank Murat Kural, for long (endless?) discussions on very similar matters. This work explores a different path from the one taken in our joint work. Nevertheless, Kural and Tsoulas (2004) forms the conceptual impetus behind most of what I say in this paper. Needless to say, none of the above agrees with all I say here. Remaining errors are my own.

address the fundamental issues, namely the use of indices as refrential devices calls us to coinsider the status of reference in the theory. I will set out certain concepts that will allow us to bypass the issues regarding reference and quantification. Then I will address the conception that indices are only devices of convenience. Then, we will come to the question of indices as elements that violate the inclusiveness condition. In the second part of the paper I will propose a view of indices that sees them as lexical elements. Finally I will consider the impact of the analysis for the formulation of binding theoretic relations.

2 Troubles with indices[1]

2.1 Reference and Quantification

As a device indices, (notation: numerical subscripts) on pronouns and DPs, immediately suggest themselves for the notation of relations of identity (in the relevant sense). Consider for instance the opening sentence of Fiengo and May (1994):

(1) In characterizing syntactic relations there is no notion more central than that of an index. This is because it is this notion that allows us to speak to speak of various elements in a structure as "going together" in some sense as being the same or different.

important though it is, this use of indices is in fact derivative. The primary purpose of an index is, of course, reference. A pair of coindexed elements corefer by virtue of the fact that a single *indexed* element *refers*. In assigning values to (unbound) pronouns the assignment function g is most commonly thought as a function from the set of natural numbers to individuals. This state of affairs, however, does not automatically mean that indices are indspensable. They may be very useful but as many devices which present some notational convenience they may, eventually, not resist analysis. So the question that arises here is whether indices are necessary parts of the linguistic representation. There are several ways one can approach this question and certain traps ought to be avoided. First off reference. If indexation

[1]I am concerned in this paper with refrential indices alone. The general concept of an index assumed is the one given in the text. The type of index that I am not concerned with here is David Lewis's concept of '*index* as an n-tuple of features of context' packaged together (the coordinates of the index). See Lewis (1981) for more details.

is necessary to the theory of grammar and the primary purpose of indexation is reference then reference is necessary to the grammar. Discussing this point could really lead us far away but I think that this is unnecessary. Some clarification will be amply sufficient. Reference is a suspicious notion when seen strictly within the bounds of *language - world* connections.[2] There are essentially two ways in which reference can be considered suspect. First as a matter of narrow syntax. It does seem not to play much of a role within the computational system in the sense that there is little in the compurational system that cares about the worldly entity associated with an expression $\mathcal{E}$. The second source of suspicion is ontological commitment. If my saying (2):

(2) Lenin is sleepy

commits me to the existence of the individual *Lenin*, then as Chomsky has often remarked a reference based theory leads us to the commitment to the existence of entities like *flaws in arguments*, *Joe Sixpack* and so on to limit ourselves to non relational entities. The correctness of the idea that one should view with great suspicion a theory that commits one to the existence of Joe Sixpack - in a way no different that the existence of my mother for instance - cannot be seriously doubted. But, at the same time, I don't think that ontological committment ought to be the barrier that Chomsky makes it to be to the development of a semantic theory based on the idea that linguistic expressions are mapped onto entities of some sort of ontological status. Take for instance the recent work of G. Longobardi (Longobardi 2006) where he elaborates a '(mental) ontology and its syntax' with different types of elements (namely, kinds, objects, and properties). These are the elements of the, as he puts it, the ontology of the C-I system and he develops accordingly definitions for the familiar notions of reference and denotation. The point here is the ontology in question is clearly an **I-ontology** and one might feel lees worried about making commitments concerning the existence of particular kinds of things in that ontology. Now, if Longobardi's assumptions are on the right track there must be a device to make the connection between elements of the Domain and expressions of the language. An alternative one might try to pursue (I won't) would amount to developing a theory whereby referential expressions are associated

[2] This is a view that Chomsky has repeatedly expressed in many places and in different ways. A representative selection: Chomsky (1975; 1992; 1994; 1995a) Also the remarks in Stemmer (1999) and elsewhere. For an interesting view that holds that referential semantics is indeed possible within Chomsky's assumptions and compatible with them see Ludlow (2003) and Chomsky's response in the same volume (Chomsky 2003)

with reference conditions, *not* actual referents,[3] in a way this also makes commitment to odd entities disappear. But if that takes care of reference, our woes do not end here. There is also quantification. The Tarskian, satisfaction based understanding of quantification has forced us into what has now become the orthodox view of quantification, the so called objectual view, i.e. quantifiers range over actual objects. As Chomsky (1993: pp. 34 and fn. 42) correctly points out this idea is inappropriate for the semantics of natural language. Specifically, Chomsky writes:

(3) [...] some of the notions used here (e.g. objectual quantification) have no clear interpretation in the case of natural language, contrary to common practice.

Natural language quantification looks a lot closer to what R. B. Marcus (Marcus 1972) called substitutional quantification.[4] Although it is beyond the scope of this paper to get into the details of substitutional quantification suffice it to say that it has two particularly crucial properties. First it carries no ontological committment. Here is Marcus (1972) on this point:

> When ontological inflation is avoided, the apparent anomalies that arise in going from so simple a sentence as:
>
> A statue of Venus is in the Louvre
>
> to
>
> $(\exists x)$ (A statue of x is in the Louvre)
>
> are dispelled. Whatever the *ontological* status of Venus, it is not something conferred to by the operation of $\exists$ quantification substitutionally conceived.

The second interesting property is the fact that substitutional quantifiers quantify over *expressions* rather than objects (hence in fact the lack of ontological commitment and existential import)

Under the set of ideas sketched above, it would then seem that any misgivings one might have in using indices for reference and quantification can be safely put aside. Let's now move to the second kind of *trouble* with devices like indices.

[3] An approach along these lines has recently been elaborated in Sainsbury (2005).

[4] For more on Substitutional quantification see Kripke (1976), Baldwin (1979) and references therein.

2.2 Linguistic Pragmatism

Although connected in some way to the comments in the previous section, this one is a bit different. The basic concern that proponents of *linguistic pragmatism* have with indices is that they do not do justice to the complexity involveed in reference assignement in *utterance interpetation.* In their view, invoking an index to assign reference or a context to specify a meanign for an utterance is in fact not possible because utterances don't come with contexts and indices attached to them. Most of the work that hearers have to do is pragmatic and inferential. Here is how Stephen Neale expressed this point of view in a recent article Neale (2004: pp. 81-82):

(4) Idealization and abstraction from the details of particular speech situations or contexts is unavoidable if work is to proceed. To this extent, we may temporarily avail ourselves of the formal 'indices' or 'contexts' of indexical logics in order to anchor or co-anchor the interpretations of indexical or anaphoric expressions that are not or primary concern at a certain point of the investigation. we should not take indices themselves particularly seriouosly, however. They are useful transitory tools, methodological or heuristic devices, not serious posits in any theory of utterance interpretation.

According to Neale then, an index is something that we use when we don't want to bother with what it stands for in order to get on with other, more pressing matters.[5]

[5] It should be pointed out here that this view might seem to accord nicely with Chomsky's approach to interpretation. For instance on the face of comments like the following (Chomsky 2000: p.132)

> It is possible that natural language has only syntax and pragmatics; it has a "semantics" only in "the sense of how this instrument, whose formal structure and potentialities of expression are the subject of syntactic investigation, is actually put to use in a speech community" to quote the earliest formulation in generative grammar 40 years ago, influenced by Wittgenstein, Austin and others."

The quote Chomsky refers to is from Chomsky (1955, 1957). Although there are affinities, which one might see as so-called pragmatics is a part of the external performance systems which access linguistic representations. It seems to me that the two views are ultimately incompatible for precisely the reasons that were outlined in the discussion of reference. Very briefly, one would require I-pragmatics to get to the I-conceptual system. There seems little space for an externalist pragmatics here. Neale himself seems to be aware of the differences. See Neale (2005)

But whatever one might think of utterance interpretation the question of whether indices occur in linguistic representations is quite separate. Interestingly, in yet another recent paper, Neale comments directly on the use of indices in linguistic representations when they are used to represent binding relations. In Neale (2005: p.214), he writes:

(5) We turn now to indexing. To say that α and β are co-indexed is to say something of syntactic import that may or may not have interpretive consequences depending upon how indexing is elaborated. Let us suppose each DP is assigned some index which we might indicate as a subscript. What prevents co-indexing being of "merely syntactic" interest (if this even makes sense)is its *interpretation*. The whole point of indices would disappear if co-indexing were not meant to indicate something of interpretive significance. When 'himself' takes the same index as 'John' [...] we think of the two expressions as linked for the purposes of interpretation.

In a rather perverse manner it seems that Neale's comment in (4) is far more consonant with the view that Chomsky has been advocating based on the inclusiveness condition. But Neale's comment only in part refers (if at all really) to binding realations (he mentions co-anchoring which is a more general notion), as opposed to the comment in (5) which is incompatible (at least at first sight) with inclusiveness.[6] Before we get into a discussion of inclusiveness (the third source of trouble) I think we can also safely put aside the concerns arising from Neale's linguistic pragmatism. The point to keep in mind here is that reference, as conceived above is not a world - language connection. It is rather an internal language to C-I ontology relation. This is not to say that it could not be done differently. It only says that this is cannot be taken as an argument against the idea that some device could/should be used to make I-connections between elements of the language and elements of the C-I domain of quantification. Furthermore, as Neale's note in (5) indicates the language internal uses of indexing remain largely unaffected.

[6]Neale is aware of this and says so in a footnote (note 86 p. 214).

2.3 Inclusiveness

The inclusiveness condition also known more recently as the *No Tampering Condition* (NTC)[7] (Chomsky 1995b) is given in (6):

(6) ‘ A “perfect language” should meet the condition of inclusiveness: any structure formed by computation (in particular [PF and LF]) is constituted of elements already present in the lexical items selected for [the numeration]; no new objects are added in the course of computation apart from rearrangements of lexical properties (in particular, no indices, bars, traces, lambdas)’

Why should a perfect language meet the IC? The idea here is that the IC/NTC is motivated as a *natural requirement on efficient computation* and its status as such is not seriously in question. By this, I mean that it is certainly more efficient for the computation to proceed without manipulating the internal structure of lexical items or by creating intermediate projection levels and so on.[8] One particular, often cited, much less properly discussed, and rather problematic consequence of inclusiveness is the ban on indices. Now within the context of the comments in the previous sections and setting the NTC/IC temporarily aside for the sake of the argument the question I want to ask is this: The NTC notwithstanding, wouldn't indices be **required** by principles of efficient computation, assuming that such principles substantially constrain the efficient and successful mapping $NUM \rightarrow C-I$?[9] I think that the answer is positive. Indexation, as a means to assign reference (to individuals of the C-I system) to linguistic expressions, and derivatively, to signal co-reference and binding relations, are necessary. So, we have now reached a paradox, namely: *how can inclusiveness -itself a principle of efficient computation entailed as it is by the notion of perfection preclude the use of indices when a perfectly efficient computation mapping a*

[7] As I understand it, inclusiveness is really entailed by the NTC, as, say, adding an index would be tampering with the Lexical Item. The NTC is a more wide ranging condition.

[8] Although, valuation of unvalued features might, in certain circumstances count as tampering but I will leave this aside. I assume we must accept at least that much tampering

[9] Notice also that the question is independent of a variety of other similar questions regarding, say the best place for the binding theory to apply etc. this is a basic question about the role of inclusiveness. Also, one should not think that once indices, or whatever, are allowed then some sort of floodgates are open, if sufficient motivation exists then fine, otherwise not.

numeration to the C-I interface would require them? I leave aside here the option that whatever referential indices handle -we keep binding still aside for now- is taken care of at some unspecified place in some unspecified manner. In other words I do not assume that binding/anaphora is altogether outside the domain of the grammar. Indeed, the only reason to asume something like that is that the analysis of binding/anaphora &c tends to involve things that have been a priori ruled out (indices and the like). But we saw that this is not necessary and under an appropriately elucidated conception of the elements of the theory of grammar, there seems to be no reason to assume something like this.

To sum up this general discussion then, it seems that from a rather general point of view, and under suitable assumptions and idealizations, there is a case against the use of devices such as indices. The case in question is twofold and responds to the two uses of indices.[10] First for reference simply. Neale's linguistic pragmatism purports to ultimately do away with indices as referential devices. Chomsky's inclusiveness goes a step further and eliminates them also in their *relational* use. Chomsky's stance is of course stronger and for him, eliminating indices in their relational function is tantamount to eliminating them altogether since he does not see reference *per se*, at least as it is generally defined as part of the semantics of natural language. However, what I hope to have shown here is that as soon as we start take more seriously the more general framework of sentence interpretation for minimalist grammars, we are led to make a number of assumptions regarding reference and quantification which eventually remove all *a priori* problems with the use of indices. But I tried to go a step further. In fact, the argument went, the grammar needs indices in order to be a maximally efficient computational device mapping Num t C-I. And yet indices are banned for the very same reasons. This is the paradox with which we end up. With that much by way of background, I will now move to consider a solution to the papradox.

3 A solution to the paradox

I want to claim here that a solution to the paradox above can be found if we put forward a different conception of what an index is. It would be pointless, it seems to me, to try to solve the paradox by inventing a completely different mechanism to represent what indices represent. Indices

[10] I completely disregard here other uses of indices, such as movement indices etc... I assume that these are indeed unnecessary.

have special characteristics (most prominently their unbounded nature) that make it so that any other device will have to answer the same questions. The first step towards a solution is to understand the nature of indices in representations. For simplicity, I will concentrate during the formulation of the proposal to indices applying to nominals only.

3.1 Constant and variable indices

I want to point now at two different types of indices, they are not different in nature - they are both indices (numbers if you wish). They are different in that they play different roles. Take first indices on simple pronouns as in (7)

(7) She_4 smiles

In this case, the index 4 is an interpreted index, given by an assignment function g, in a way that $She_4 = \textbf{Eleni}$. But if the actual interpretation of the index is provided by the assignment function only, then the only thing that the syntax will require is some kind of variable index, say:

(8) She_x

Call this a variable index. On the other hand, there are things that are not variable in the same way. Take for example the interpretation (perhaps gesturally supported) of the DP *this man* in (9):

(9) Call the wagon, this man is dead

In this case, *this man* only refers to a specific man. Now, if this is true, then we already have to modify slightly the standard concept of an index and the way it gets interpreted. Pronouns and DPs will not be indexed numerically. The assignments function will map what I called here variable indices to numbers which in turn will refer to the elements in the i^{th} position of individuals, arranged in a sequence.

In a similar vein, consider indexical pronouns like *I* and *You*. These pronouns do not require indices in the classic sense because they, in a way, **are** indices.[11] Call these *constant* indices.[12][13] To put it differently, these are *interpreted* indices that are overtly realised in the form of pronouns/demonstratives. We can extend further this idea of overt realisation of indices to cases such as the following (10):

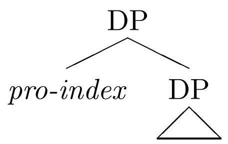
(10) A: Which Peter ?
B: That Peter

in (10) the question ranges over the index of the name *Peter* and the answer is given by an overt realisation of the questioned index. The proposal here draws on previous work by Burge (1973) and discussion in Larson and Segal (1995) and Elbourne (2002). It is also close in nature to Postal's classic proposal that pronouns are Ds (Postal 1966) but differs in implementation from his. The realisation of *pro-index* in an adjoined position is also motivated by examples like (11) alongside Postal's examples in (12):

(11) a. I Claudius
b. We the pepole

(12) a. We communists
b. Us linguists

If this line of reasoning is on the right track, then I would now like to take it to its natural conclusion. If some pronouns, demonstratives, determiners behave like or are indeed indices, then the null hypothesis to investigate is that **all** indices are some form or pronominal element accompanying nominals. More concretely, I would like to propose here that an index is in fact, in the general case, a *pro* which is merged with all DPs:

(13)


We could further streamline the mapping to C-I by maintaining the current understanding of assignment functions as functions from variable

[11] This is close to Peirce's definition of an index sign (Eisele 1976):

> An index is a sign fit to be used as such because it is in real reaction with the object denoted

[12] The analogy that I am drawing here has its (obvious) limitations and requires further discussion. For my present purposes, however, it will do.

[13] In keeping with Peircian terminology I might have called them dynamic constants.

indices to integers, by restricting the reference of *pro-index* to the set of integers. The immediate effect of this proposal is that the paradox to which we were led to in the first part of this paper is immediately resolved. Let's consider each of its aspects in turn:

(14) **Efficiency of the $NUM \rightarrow C - I$ mapping.** Under my proposal this mapping meets the efficiency criteria of perfection as the computational system delivers a structure that can be immediately interpreted without any further tampering by the semantics. Obviously the interpretation will enrich the content in many ways but crucially not the structure.

(15) **Efficiency and the *No Tampering Condition*** Again here, there is no tampering of lexical items. Inclusiveness is preserved since a *pro* is nothing but a lexical item and it is added by merge, which means that this is no more tampering that building a normal structure.

(16) **Indices.** They are simply there, nothing more needs to be said, when they are propserly understood.

Having now dealt with the issue of referential indices and their status with respect to the IC/NTC, the next step is of course to consider how these indices enter into the establishment/representation of anaphoric relations.

4 Binding theory and minimalist architecture: some background

Binding theory is supposed to raise a variety of serious problems for minimalist theorists. A priori the reasons seem basic but technical, namely:

(17) a. BT requires representations. (S-structure, LF etc. . .)
b. BT requires indices (we dealt with that)
c. BT establishes relations that tend not to fit the general mould of feature checking/valuing type of relation.

more precisely, the issue of representation (17-a) boils down to the fact that in the current framework which is pushing derivationalism to rather radical positions especially concerning phase-by-phase spell-out, there is effectively no representation (full LF) left, where BT-relations can be defined. It is thus not surprising that Chomsky has repeatedly suggested, especially in post 1995 work that binding is not part of nor is it significantly restricted by the operations of the computational system. Secondly, concerning the type of relation that BT requires (17-c), the most striking anomalies here are related to principles B and C. In other words, the negative side of BT. It is rather difficult to imagine a reasonable way to establish feature-based relations that will be satisfied if the values of the features in question are *Not* alike.[14] This state of affairs has not gone unnoticed, the reactions to the above issues have been somewhat varying, and ranging from radical rejection of either the framework or the fact that binding theory is at all syntactic. The following is a selection of the more radical views

- BT should be reformulated in order to apply at LF only (Chomsky 1993)
- BT should be reinterpreted as a semantic module only (Schlenker 2003)[15]
- BT principles and generalisations are what they are and

> ...If some of them are not *[statable in minimalist terms]*, which I assume to be the case, the Minimalists would have to come up with roundabout ways that would yield the same effects. Alternatively they will have to revise the framework itself to accommodate the need to make these generalisations.

(Kuno 1997: 4)

The more accommodating views have so far included attempts to to provide minimalist/syntactic accounts of BT in a way to keep it within the purview of syntax. In this case we have the programme initiated by Norbert Hornstein (Hornstein 2000 and subsequent work), which, in a nutshell consists of the following: Given that movement is the only thing that the grammar will countenance, then movement must/will be the way to establish interpretive relationships such as binding and control. This spirit, together with the so-called *Derivational Approach to Syntactic Relations*(DASR) Epstein *et al.* (1998) has given birth to two approaches which are designed specifically to address binding-theoretic issues. They are those of Kayne

[14] On the last two points especially, see Kural and Tsoulas (2004).

[15] This is not the only semantic reinterpretation of BT, of course, it is though one of the most recent ones and partly at least as a reaction to the above concerns. See also Büring (2005)

(2002) and Zwart (2002). Both authors are led to the conclusion that a large set of data for which traditional binding theory was designed can and should be derived by movement. This is not a surprising conclusion given their basic assumptions. What is more interesting is that they are led to almost diametrically opposed conclusions in what concerns the notion of *accidental coreference* (Lasnik 1976). On the one hand Kayne concludes that there is no place for accidental coreference[16] in the theory of grammar, whereas Zwart's investigation leads him to conclude that all pronominal anaphora is a case of accidental coreference.

Finally, the important recent work of Safir (2004; 2005) must be mentioned here. In these works Safir develops a highly innovative theory of binding and anaphora, based in part on a competition algorithm determining which *dependent* forms will occur in which environments. The scope of his theory is much wider and a great deal more comprehensive than the other theories mentioned so far. For reasons of space, I will not review the details of the theory here. There is, however, one point, which he discusses in some detail in the introduction of Safir (2005) which is related directly to my present concerns regarding the nature and use of indices. Safir, following Higginbotham (1983), discusses the asymmetry problem of indices. In a nutshell, when an anaphoric element α depends on a antecedent β the relation is not symmetric given that β does not depend of α in any meaningful sense. Therefore, marking anaphoric relations with indices (which are symmetric) seems inappropriate.[17] Safir then concludes that Higginbotham's (1983) arrow notation (see (18)) is more appropriate.

(18) Everyone loves his mother

Similar questions to those arising with respect to indices arise with respect to arrows too, especially from the point of view of IC/NTC, but I will leave those aside here. What I would like to do is to see whether the conception of indices that I suggested in earlier sections can help overcome the asymmetry problem. What I would like to suggest here is that there might be a way to overcome the asymmetry issue and by the same token solve the issue regarding the non-feature checking nature of BT-relations (17-c)

[16]Save for cases of "mistaken identity" which I will leave aside here.

[17]I am simplifying a great deal here (probably far more than it is healthy) since I have not mentioned the role of C-command etc. See Safir (2005)'s chapter 1 for more discussion.

4.1 Asymmetry, Directionality, and the Probe-Goal system

The probe-goal system, basic in dependency formation in minimalism, is also fundamentally asymmetric. Interestingly though, it is asymmetric in exactly the opposite direction from the one required by the binding theory. As is well known, a probe $\mathcal{P}$ is a probe in virtue of an uninterpretable or unvalued feature which needs to be valued by a matching goal $\mathcal{G}$ that is internal to the syntactic object headed by the probe. It is crucial, at least for Chomsky (2005) that $\mathcal{P}$ is not required to C-command the goal $\mathcal{G}$. $\mathcal{P}$ seeks $\mathcal{G}$ in its domain. Binding theory on the other hand has always been formulated in terms of the dependent being C-commanded by the element it depends upon. Despite that discrepancy, I would like to try to take advantage of the fundamental asymmetry of the probe-goal system to provide an index-based asymmetric account of binding. To do so I want first to return to the nature of the *pro-index*. Most importantly I want to specify further two things regarding its featural content. I will take the feature matrix of a *pro-index* to be constituted as follows, for the relevant part:

(19) $$\begin{bmatrix} U\varphi \\ +/-R \end{bmatrix}$$

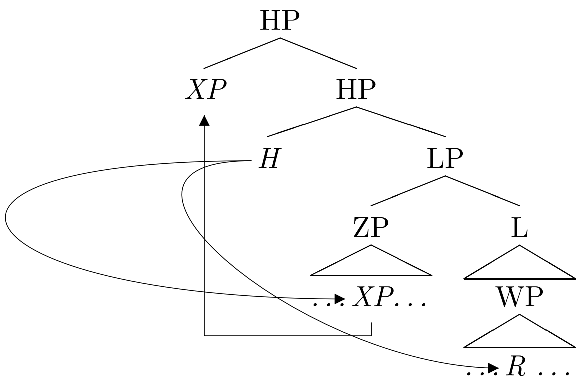
That *pro-index* may contain φ features in not unexpected, it is pronominal in nature anyway. The [+/-R] feature on the other hand represents the difference that we pointed out earlier between variable and constant indices. A [+R] index corresponds to a constant index whereas a [-R] one corresponds to a variable index, which can be given a value by the assignment function g. As for the φ-features, they are similar to the φ-features of Tense, in that they are uninterpretable and need to be valued by a goal in the domain of *pro-index*. With this much in place in terms of conceptual and technical apparatus, we can move on now to the binding conditions themselves.

5 The Binding Conditions

The binding conditions I will now try to reformulate are the classical ones and they don't need repeating.

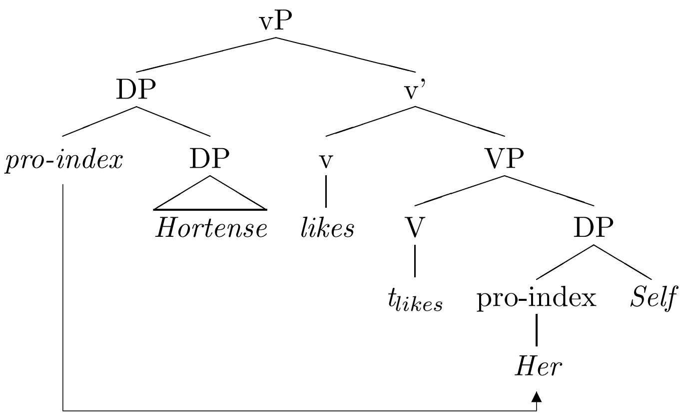
Let's start with Condition A. As Chomsky (2005) has suggested, condition A may in fact be not a case of C-command but rather a case of Agree. how exactly can this suggestion be implemented is a technical challenge to say the least. It is clear, however, that if we take the general line on the probe-goal system that Chomsky (2005) suggests we will end up with a situation that would seem, intuitively at least, unsatisfactory. The situation I am referring to is as follows. According to Chomsky (2005) the way to understand Condition A as a case of Agree is by assuming that a reflexive in object position bound by an element in [Spec v] is in fact *not* bound directly by the element sitting at [spec, v]. Rather, v is the head that probes and presumably agrees with the reflexive and somehow the reflexive appears *indirectly* to be bound by [spec, v]. In fact what Chomsky seems to have in mind is a case where both the reflexive and the antecedent are goals of the same probe. The AGREE processes can be shown schematically in (20). On the other hand, under my proposal we could conceive of the φ-features of the *pro-index* as the probe which would cause an agreement effect with the reflexive. One possible schematic representation of (21) would be (22)

(20)



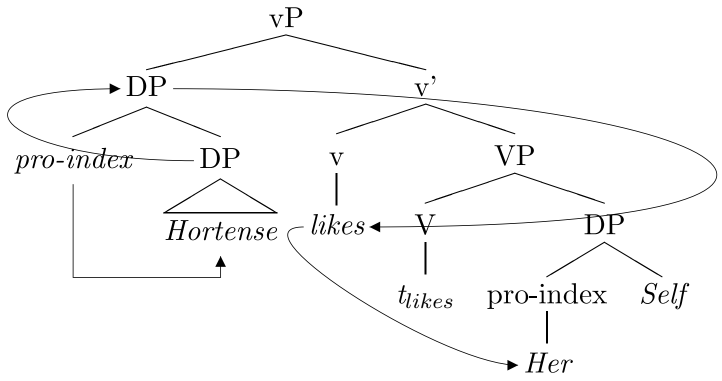
(21) Hortense likes herself

(22)



A number of problems are immediately obvious with (22) to take the most important one: how does the subject, or more specifically the subject's index probe into the vP all the way to the reflexive? I want to suggest here that the relation is indirect. the probe of the *pro-index* takes two separate paths, first it probes into its own domain, its sister constituent where it finds the *varphi* set of the nominal and gets valued. At the same time, as the D head is being altered the whole projection is altered dynamically, this should be true given that under bare phrase structure model there is no $D^0 - \overline{D} - DP$ but $D - D - D$. Therefore no issues of feature percolation etc arise. Then there is transfer of properties to the phase head v which then probes the reflexive. Schematically, this is represented in (23). The curved lines represent the indirect agreement path and the straight lines the direct path. Notice also that I am taking the pronominal part of the reflexive to be in fact the overt (another one) realisation of the *pro-index*. Thus reflexive anaphors of the type *Herself* are represented simply as *Self*, the fact that they are anaphors and therefore dependent is captured by the presence of the *pro-index*

(23)

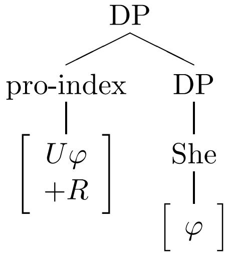


Another perceived weakness of this approach is also the fact that it seems to introduce again [Spec - Head] relations. I do not know exactly why this would be a weakness. The only reason one might offer is that it seems that operations are not only driven by phase heads. But this is not exactly accurate. It is the phase head that drives the operations. Transfer of properties form the specifier is precisely because the specifier cannot drive operations in the same way. If this line of reasoning is along the right track then we have a way to reconceptualise in a natural manner condition A as a case of agree without direct reference to C-command.

6 Condition B

Regarding condition B, there two options. Either the pronoun has a [+R] feature or a [-R] one (a constant or a variable index respectively). The representation of a [+R] pronoun then would be (24):

(24)

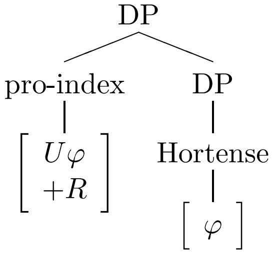


The pronoun's $U\varphi$ probe is valued by the φ features of the lexical pronoun. As a result, this pronoun is *closed* so to speak and cannot be further probed (φ-agree). No more needs to be said. In the case now of a pronoun with [-R], i.e. a pronoun with a variable index. Again here there is no possibility of the pronoun being directly probed and φ-agree with anything since it is closed. However, the [-R] feature can be probed and *be bound* by an operator, which does not (must not?) require φ-agreement. If Adger (2005) is correct, there is even more reason to assume that operator binding ought to be disconnected from φ-feature sharing. True, Adger (2005) is more concerned with anaphors but the two views are compatible with only minor tweaking. So this is the case of bound pronouns.

7 Condition C

Condition C is indeed the easiest case. The representation of a name will be (25):

(25)



Obviously then, it can be the target of no probe as expected. The only cases will be so-called mistaken identity cases which are the purest examples of coreference[18] like (26):

(26) Hortense is Delia

Again, no more needs to be said.

8 Where are we now.

Assume now that the preceding development is indeed on the right track. The question is where does that leave us now? more precisely, is there a sense in which the proposal developed yields the effects foindexation insofar as the binding theory is concerned? the answer to this question turns out to be more complicated than one might initially expect. I believe that the truth is that indices, as standardly conceived are, in this proposal, eliminated really. There are no numerical subscripts anywhere to be seen in the representations given above or any other that this proposal entails. The focus here is shifted to the possible relations that nominals may enter with pronouns and reflexives, as these are made possible by the standard tools of depenedency formation, i.e. the probe-goal system and the relation AGREE. At the same time though, this proposal recognises that these relations are not relations between pronouns/reflexives *per se* and their antecedents. Just as in a tghoery that is enriched with standard indices relations of identity reduce to relations between indices, I have represented this as relations between the *pro-index* elements accompanying pronouns and nominals. Thus, in a clear sense this theory does yield indexation and the effects of co-indexation. Furthermore, this theory allows a straightforward syntax semantics mapping and removes some of the mystery from the mechanisms of the syntax semantics interface.

[18] Even Kayne allows them.

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