DYNAMIC ANTISYMMETRY: MOVEMENT AS A SYMMETRY-BREAKING PHENOMENON[1]

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Abstract. Movement is a specific property of human languages and one that has at least implicitly been recognized in all linguistic theories. The most recent development posits that movement is forced by morphological requirements (Chomsky 1995). In this paper I will suggest a different approach to movement, suggesting that it is essentially related to the geometry of phrase structure. A weak version of Kayne's 1994 theory of the antisymmetry of syntax, namely 'dynamic antisymmetry' will be introduced. In the strong version, UG only allowed for antisymmetrical configurations, in terms of c-command. Within dynamic antisymmetry, however, symmetrical configurations can be generated, provided that movement makes them antisymmetric before spell-out. In other words, I will suggest that movement is a symmetry-breaking phenomenon, i.e. it is triggered by purely geometrical factors as opposed to morphological ones. Data will range from small clause constructions (both in copular sentences and *believe*-type verbs) to wh-movement in interrogatives. Italian and English will be the major sources of examples.

1. Theories of movement

Movement is a distinctive property of human languages and one that has been at least implicitly recognized by all modern linguists. To put it in Chomsky's words, the fact that lexical items appear displaced from those positions where they receive interpretation is 'an irreducible fact . . . expressed somehow in every contemporary theory of language' (Chomsky 1995:222).

Despite this broad convergence on recognizing the empirical issue, however, there is no general agreement on the nature of movement. As a matter of fact, the general issue is split into two distinct questions.[2] The first question concerns the formal mechanisms that underly this phenomenon, i.e. how is movement actually triggered? The second one, instead, asks why all and only human languages have this property. As for the first question, there have been several different answers that will be briefly reviewed here ranging from Case theoretical reasons to quantification,

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[1] This paper was presented during 1996 at the *XXI Incontro di Grammatica Generativa* (University of Bergamo), at the *XIX GLOW Conference* (University of Athens), at a seminar at the Istituto Scientifico H San Raffaele (Milan), at a talk at CUNY (New York) and at MIT (Cambridge). I am indebted to the audiences of these conferences for many helpful comments. Special thanks to Gennaro Chierchia, Noam Chomsky, Giorgio Graffi, James Higginbotham, Luigi Rizzi and Richard Kayne for their generous attention to this working hypothesis.

[2] See in particular Chomsky (1995): section 4.7.1.

just to focus on movement of maximal projections. As for the second one, Chomsky observes that 'it arose in the early days of generative grammar. Speculations about it invoked consideration of language use: facilitation of parsing on certain assumptions, the separation of theme-rheme structures from base-determined semantic (θ) relations, and so on' (Chomsky 1995:317). Crucially, then, answering this second question would require the exploration of the 'extraneous' conditions imposed by the interaction with external systems in the sense specified within the minimalist approach.

Although the two questions (namely, how and why movement is realized) are distinct, it is nevertheless clear that a link is established between the actual mechanisms of movement and the 'extraneous conditions at the interface'. The key-notion is 'interpretability'. In the minimalist program, this is captured by assuming a fundamental distinction within the morphological component: features can be either [−Interpretable] or [+Interpretable] at the relevant interface. Movement, then, is driven by the search for deleting those features which are [−Interpretable]. The way deletion is accomplished involves the process of checking, typically including a spec-head relation. At a rather informal level, then, the mechanism of movement can be synthetically described as follows: whenever a [−Interpretable] feature is introduced into the derivation, the system forces a category containing a [−Interpretable] feature of the same type to be moved in order to establish a spec-head configuration between the two features (checking relation). This process deletes the [−Interpretable] feature by definition. From this perspective, then, movement would be nothing but a device to wipe out non-interpretable entities at the relevant interface (see Chomsky 1995:278). It is important to notice that the notion of 'interpretability' is one that inherently relies on conditions that are extraneous to syntax in the broad sense.

In this paper, I would like to propose an alternative approach to movement, based on Kayne's theory of antisymmetry.[3] The guiding idea is to link the geometry of phrase structure to movement in such a way that movement will be considered as a 'symmetry-breaking phenomenon'. In other words, I would like to explore the following informal conjecture:

(1) movement is driven by the search for antisymmetry

If this proposal proves empirically adequate, one major consequence will be that the reasons of movement would not be considered as 'extraneous' to syntax, rather, they will be internal to this component and accessible to proper linguistic investigation. Of course, I am not in a position to

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[3] The essentials of Kayne's theory will be given in section 3. For general reference see Kayne (1994) and Cinque (1996). In fact, I will propose a weaker version (in the technical sense) of antisymmetry as will be illustrated in section 3.

explore the whole range of consequences of the conjecture in (1). The limited aim of this paper is to give reasons against the current theory of movement and to indicate the line of reasoning that the alternative approach would lead us to take on the basis of a selected number of empirical cases.

Before proceeding, I would like to overview briefly the theories of movement as they established themselves during the development of the principle and parameters framework. The first principled account, that goes back at lest to the late seventies, was based on different types of reasons distinguishing movement of maximal projections and heads in the first place. The first class, in its turn, distinguishes between A- and A′- movement: typically, noun phrases are displaced to A-positions to acquire Case, with the sole exception of expletive replacement, while wh-element and quantifiers in general move to A′-positions to acquire their proper scope and create the operator-variable configuration. As for head movement, the reason is mainly morphological. Consider two proto-typical cases: V^o moves to I^o to allow the inflectional morphemes (I^o) to receive the proper support (V^o), unless they can be expressed on an auxiliary, while $V^o_{I^o}$ moves to C^o in interrogatives to support the wh-features, unless again some support is independently provided.[4]

The mechanisms based on morphology have progressively been generalized superseding the other accounts.[5] The crucial step was the establishment of the so-called 'criteria', such as the wh-criterion, which requires both a maximal projection and a head marked [+wh] to be in the proper spec-head configuration.[6] As I briefly mentioned, within the minimalist program the weight of morphology in movement has further increased to become the sole reason for movement, via the notion of '[± Interpretable] feature': from wh-movement to quantifier-raising, movement (or equivalently, attraction) would be driven by the necessity to wipe out the [−Interpretable] features, according to the proposed taxonomy. Thus, the conjecture in (1) can be seen as an alternative to the morphology-based account of the theory of movement, in the broad sense of minimalist and pre-minimalist meaning.

The paper is organized as follows: in section 2, I will offer evidence against the morphological theory of movement; in section 3, instead, I will provide evidence in favour of the conjecture in (1), by solving the problem examined in section 2 (section 3.1.) and by providing further

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[4] I leave the question concerning verb-second phenomena aside; as for arguments against expletive replacement see Moro (1990) and Moro (1997): chapter 2.

[5] Interestingly, the reduction of the Extended Projection Principle (EPP) to morphology is still controversial (see, for example, Donati & Tomaselli (1995) and references cited there). That the EPP cannot be inherently related to the Grammatical Function of subject of the predication was explicitly assumed for example in Moro (1988), (1990); see Moro (1997): chapter 1 and the appendix for a discussion.

[6] On the wh-criterion and its logical ancestors see Pesetsky (1981), May (1985) and Rizzi (1991).

independent support (section 3.2.); in section 4, I will eventually single out some of the consequences, problems and expectations that the theory based on (1) discloses.

2. Evidence against morphological accounts of movements

Let us start from a simple case. Consider two noun phrases like the following:

(2) a. these pictures
     b. the cause of the riot

These two noun phrases have different features, indeed all their components have different features, including of course formal features. This can be technically captured by construing the set of Formal Features (FF) of these elements. Suppose we take the most prominent element of two such noun phrases, which gives the 'label' to the whole constituent, namely *these* and *the*. The set of Formal Features of these two entities would not coincide since, for example, one is singular and the other plural:

(3) a. FF(*these*) = {plur., . . .}
     b. FF(*the*) = {sing., . . .}

These two elements can enter into the computation with other lexical elements in a given Numeration. So, for example we can have the following sentence including the two noun phrases:

(4) these pictures have t revealed the cause of the riot

As indicated in (4) *these pictures* is moved from a lower position within the verb phrase to a higher position crossing over the auxiliary. The morphology-based account of movement explains this process of attraction/movement by assuming that it is needed to delete the [−Interpretable] Case features of the verb as specified in the lexicon, here the Nominative case feature.[7] The verb must also delete the Accusative case feature, thus the object is raised after spell-out to reach the proper configuration.[8] In both cases, the noun phrases must enter into a spec-head relation with a proper functional head. As a first approximation, we can capture this formal relation as follows, where F^o is a functional head:

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[7] Alternatively, it is the plural features of the verb that attract *these pictures* and the relevant Case feature is checked as a 'free rider' in the sense of Chomsky (1995). I will not consider free riders here.

[8] The fact that the object can move later than spell-out is due to the strength of the feature which is assumed to be strong for the Nominative case and weak for Accusative case. I will not further discuss this distinction here.

(5)
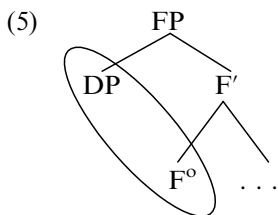
Within the early minimalist works, where Agr-heads were available, the two noun phrases entered into a spec-head relation with two distinct F°s (respectively, Agr-s° and Agr-o°); within the most recent development where Agr° heads are no longer included, a multiple spec-relation is allowed with a single functional head, i.e. T. These two options can be represented respectively as follows:

(6) a. [these pictures]$_i$ Agr-s$_i$ . . . [the cause of the riot]$_j$ Agr-o$_j$ . . . [$_{VP}$ t$_i$ . . . t$_j$]
   b. [$_T$ FF(Obj) [$_T$ FF(Subj) [$_T$ Vb [$_T$ T [$_{VP}$ t$_i$ . . . t$_j$]]]]]

Consider now a different Numeration involving the same noun phrases and the copula. Grammar allows two distinct structures like, for example, the following:[9]

(7) a. these pictures are t the cause of the riot   (canonical)
   b. the cause of the riot is these pictures t   (inverse)

As indicated, there is a crucial difference between the two sentences: in (7)a the subject has been raised from the small clause whereas in (7)b the predicate has been raised. For the sake of simplicity, let us concentrate on the inverse copular sentence, namely (7)b. If we immediately apply the formal mechanisms we applied to the previous sentence in (4), we would expect to have the following two structures, after spell-out, paralleling (6)a–b:

(8) a. [the cause of the riot]$_i$ Agr-s$_i$ . . . [these pictures$_j$] Agr-o$_j$ . . . [$_{SC}$ t$_i$ t$_j$]
   b. [$_T$ FF(Pred) [$_T$ FF(Subj) [$_T$ Vb T [$_{SC}$ t$_{Subj.}$ t$_{Pred.}$]]]]

In other words, under the morphological theory of movement we expect both noun phrases to be displaced at some point in the derivation. This conclusion appears to run against an established cluster of facts concerning copular sentences. I will only reproduce some of them referring to a detailed account in the cited work (see the previous footnote).

   The crucial fact that appears to be neglected is that once one of the two noun phrases constituting the small clause is moved, the other is 'frozen in place'; in other words, the small clause cannot be completely emptied.

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[9] In this section I will heavily rely on the unified theory of copular sentences originally proposed in Moro (1988): see Moro (1997): chapter 1 for an updated version.

This conclusion is based on several independent converging facts crucially involving both overt and non-overt movement. Consider wh-movement first, the lower subject cannot move across the raised predicate:

(9)   a. [the cause of the riot]$_j$ is [$_{SC}$ [these pictures] t_j]
       b. * [which pictures]$_i$ do you think [the cause of the riot]$_j$ is [$_{SC}$ t_i t_j]

There are several distinct ways to interpret this violation, which I will not fully examine here. For our purposes, it is sufficient to notice that there is a violation and that it is related to movement. In fact, the same wh-element can be successfully extracted provided that the predicate noun phrase has not been raised:

(10) [which pictures]$_i$ do you think t_i are [$_{SC}$ t_i [the cause of the riot]]

One is quickly led to similar conclusions when other types of phenomena are taken into consideration. Consider for example non-overt movement, involving quantifier-raising:

(11) a. [$_{IP}$ [some student's purchase]$_i$ is [$_{SC}$ every book t_i]]]
       b. * [$_{IP}$ [every book]$_i$ [$_{IP}$[some student's purchase]$_j$ is [$_{SC}$ t_i t_j]]]

       c. [$_{IP}$ [the cause of the riot]$_j$ isn't [$_{SC}$ many pictures of the wall] t_j]
       d. * [$_{IP}$ [many pictures of the wall]$_i$ [$_{IP}$ [the cause of the riot]$_j$ isn't [$_{SC}$ t_i t_j]]]

As indicted, *every book* cannot be moved out of the small clause in (11)b yielding the interpretation 'for every book some student's purchase was that book' and *many pictures of the wall* cannot have scope over the negation yielding 'there are many pictures of the wall such that the cause of the riot was not them'.[10]

   In each case, both overt and non-overt, the conclusion is one and the same: the subject of an inverse sentence cannot be moved. We then immediately recognize the puzzle here: on the one hand, we are assuming that movement is driven by morphological reasons, and thus we expect both DPs to move; on the other, we realize that only one DP can be moved, i.e. movement of the subject of an inverse sentence is blocked in all cases. This conflict represents a serious problem for the theory of movement based on morphological reasons. How can we get out of it? One possibility comes to mind: we could claim that the copula does not contain the [−Interpretable] Accusative feature that drives covert movement of the object in transitive sentences.[11] Nevertheless, despite the obvious advantage, the following example taken from Italian will pose a further problem:

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   [10] See again Moro (1997): chapter 2 for an extensive discussion of this issue.
   [11] Indeed, I made such a claim concerning the copula but for independent reasons. See Moro (1997): chapter 1.

(12) a. la causa della rivolta sono [$_{SC}$ io t]
         (the cause of the riot am I)
     b. FF (*io*) = {Nom., . . .}

The example shows in a clear way that the subject of an inverse sentence
can indeed be Case marked by Nominative case. Thus, the original puzzle
is reproduced: shouldn't the Nominative feature be deleted by entering
into a checking configuration? After all, the Nominative case feature is in
fact [−Interpretable].

   Perhaps there can be ways to adjust the theory and make these
examples fit, however I will not attempt to make any amendment to
the theory of movement based on morphology. Rather, I will offer an
alternative account. This is, in fact, the central concern of the present
paper.

3. Evidence in favour of dynamic antisymmetry

Richard Kayne's (1994) theory of antisymmetry is a theory of phrase
structure that aims at deriving the major property of X-bar theory from a
single axiom, the Linear Corresponding Axiom (LCA). The idea can be
summarized as follows. Grammar contains at least two relations,[12] R_1
and R_2, that are defined with respect to different domains. R_1 is the
relation of precedence and is defined on the linear sequence of terminal
nodes, i.e. words (and parts of words); R_2 is, instead, the relation of
asymmetric c-command and is defined with respect to the hierarchy of
phrasal non-terminal nodes. Both relations are transitive, (locally) total
and antisymmetric, i.e. for all x and y, xRy implies that $\neg$yRx.[13] The LCA
is an empirical hypothesis on Universal Grammar proposing that R_1 and
R_2, namely hierarchy and precedence, are not independent: each can be
mapped onto the other by assuming that, if the terminal node x is
dominated by the non-terminal node M that asymmetrically c-commands
the non-terminal node P, then x precedes all the terminal nodes that are
dominated by P; equivalently, if a terminal node x precedes the terminal
node y, then there is (at least) a pair of non-terminal nodes M and P such
that M asymmetrically c-commands P, M dominates x and P dominates y.
This theory implies very far reaching and pervasive consequences on
syntax.[14] Let us concentrate on a specific consequence. From this axiom,
the fundamental theorem follows that in a well formed tree there cannot
be two non-terminal nodes symmetrically c-commanding each other
unless at most one of the two non-terminal nodes contains (at least)
another non-terminal node. If this weren't so, then the (sets of) terminal

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[12] 'Relation' is intended here as a technical device, namely a two places predicate.
[13] More precisely, $\neg$ (xRy and yRx); see Kayne 1994: 4.
[14] For an extensive discussion on the matter see for example Cinque (1997) and references
cited there.

nodes dominated by the two symmetrical nodes would not be linearly ordered. Let us call this offending configuration 'a point of symmetry'.

I would like to propose here a weaker version of antisymmetry according to which Universal Grammar allows the generation of points of symmetry, provided that the set of terminal nodes dominated by either non-terminal node constituting this point of symmetry be moved. Before looking at the technical implementation of this proposal let us ask why in principle movement can solve the potential problem. The idea is the following: the LCA cannot tolerate a point of symmetry because this would end up with the impossibility of fixing the linear order of terminal nodes included in it. By definition, traces are not visible in the linear sequence, thus if one of the elements constituting the point of symmetry is a trace, then no problem is expected to arise.[15] In the rest of the paper, I will offer evidence that movement can be regarded as a symmetry-breaking phenomenon. The theory that I propose, and that I will henceforth call 'dynamic antisymmetry' (DA), will be applied to the case of copular sentences just outlined in the previous section and to the case of root wh-movement. Meanwhile, I will offer independent empirical evidence for the idea that empty categories are not visible to LCA by considering empty categories other than traces, specifically *pro*. Eventually, in closing I will offer remarks on the problems and the perspectives opened by this theory.

3.1. *Raising (in copular sentences)*

Let us go back to the pair of copular sentences in (7). In both cases, the underlying structure is the same: there is a small clause which contains both noun phrases either of which may, and one of which must, be raised to the precopular position. As noted, if movement were driven solely by morphological reasons, then we would face the problem of why only one noun phrase can be moved (either overtly or non-overtly).

Let us now focus on the small clause constituent. The structure of small clauses is an intensely debated issue (see for example Cardinaletti & Guasti (1995) and references cited there). Originally, the small clause constituent was represented just as an autonomous label, i.e. SC, immediately connecting two maximal projections (see the seminal work of Williams (1975)):

(13) [$_{SC}$ NP XP]

There have been several attempts to refine this first representation. One can recognize at least two distinct lines of research: one that aims at

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[15] For the non-visibility of traces see Kayne (1994: 133 fn. 3) and Chomsky (1995: 337). I will disregard here problems posed by well-known phenomena such as the *wanna*-contraction that have been treated by assuming that traces are linearly ordered.

regularizing the structure of small clauses with respect to X-bar theory by identifying a functional head which projects it (see Kayne (1985), Moro (1988) and Bowers (1993) among others); and one that aims at reducing small clauses to cases of adjunction to the predicate (see for example Stowell (1982), Manzini (1983) and Longobardi (1988)). One of the best established analyses regards small clauses as projections of agreement heads (Agr°):

(14) SC = [$_{AgrP}$ DP Agr° XP]

Recently, this complex structure has turned out not to be empirically justified. In particular, Chomsky (1995) proposed to avoid recourse to Agr°s both in small clauses and in inflected clausal structures, going back to the theory which preceded the so called split-Infl hypothesis.[16] In fact, the analysis of small clauses goes back to 'something like the original assumption of Stowell (1978)' (Chomsky 1995:354).

   The move from the Agr-based analyses to the bare adjunct structure appears to be especially adequate for our purposes. Consider again the small clause resulting from the combination of the two noun phrases *these pictures* and *the cause of the riot*. Crucially, the two phrases can enter into a small clause without agreement being established between them: witness, the number mismatch. Thus, we can adopt the minimal structure *à la Stowell* involving adjunction of the subject (*these pictures*) to the predicate (*the cause of the riot*) as follows:

(15)   DP*$_{the}$
         /   \
   DP$_{these}$ DP$_{the}$

As indicated in the tree, however, the simple idea of considering small clauses as the result of adjunction of the subject to the predicate has not been considered completely satisfactory. The asterisk put after the larger constituent aims at signalling that the result is not just a 'larger' predicate, for well-known reasons related to subcategorization.[17] In other words, the result of adjunction is a rather new constituent. Can this apparent ambiguity between pure adjunction and small clauses be captured? The answer seems to be affirmative if we adopt the framework developed within the minimalist program concerning Merge.

   Merge is an operation that takes two distinct constituents α and β as input and gives a larger constituent K as output. What is the label for K? Order being irrelevant, there are only two options that can be represented as follows (see Chomsky 1995:243–48):

[16] This hypothesis is related to the seminal work of Pollock (1989) based on Emonds (1985); independently, Moro (1988) proposed to split the INFL node. As for the inadequacy of Agr-based analyses of small clauses see also Moro (1997): chapter 1.
   [17] The asterisk is used, for example, by Koopman & Sportiche (1991).

(16) ∀ α, β, Merge yields K: (i)   K = {α, {α, β}}
                                     (ii)   K = {⟨α, α⟩, {α, β}}

The elements contained in the embedded parentheses are the constituents of the phrase, while the residue is the label of the phrase itself. The essential property of Merge is that the label of the resulting constituent is formed without adding extra information with respect to α and β themselves: it can either be a simple label (just either α or β, i.e. substitution) or a complex label (made by the ordered pair of the projecting element, here ⟨α, α⟩, i.e. adjunction). Again, what is crucial is that Merge does not add extra information. The question now is: how do small clauses *à la Stowell* enter into this framework? The two possibilities given in (16) do not seem to be satisfactory. Take α and β to be the subject and the predicative noun phrase of the small clause we are considering here: respectively, *these pictures of the wall* and *the cause of the riot*. The first option ((16)i) is to be excluded because we do want the resulting constituent to be neither α or β: i.e. the small clause must not have the same distribution of either subpart. The second option ((16)ii) is also problematic. In fact, it reproduces the same problems that have been 'naively' solved by adding an asterisk to the final segment of the larger category in (15): we want to distinguish between adjunction and a small clause. Of course, there is no 'asterisk' here to be put.

We can nevertheless now take advantage of the formal solution given to represent adjunction within the definition of Merge. As indicated in (16)ii, the label of a constituent K can be complex, provided, again, that no extra information is added; specifically, the label of adjunct structure is the ordered pair of the projecting element, i.e. ⟨α, α⟩. This is enough for us. It seems reasonable to assume that a further combination is available under Merge where the resulting label is made by ⟨α, β⟩:

(17) K = {⟨α, β⟩, {α, β}}

This is a formally available option. In particular, it does not run against the essential property of Merge which is that of not introducing extra information, specifically extra features of a constituent different from α and β.[18] But how can we interpret it? One possibility is that the newly formed constituent is underspecified with respect to (the features of) its subparts. The small clause would then be just this: the result of Merge of α

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[18] The format of this Merge output might seem to generate ambiguity, since from a purely formal point of view we could also have the mirror-option where the ordered pair constituting the label is inverse, i.e. ⟨β, α⟩ (James Higginbotham, p.c.). This can be amended, by assuming that the given label is intended to be the short form of the more articulated:

(i) {{α, {α, β}}, {β, {α, β}}}

In such case, the output is totally neutral with respect to α and β and, crucially, the essential requirement that Merge does not introduce new information is preserved.

[19] More explicitly, we have two pairs of nodes such that the first c-commands the second:

and β when neither α nor β project. It is not substitution, as in Stowell's original proposal, but it is also different from 'pure' adjunction, where the resulting label is made by the ordered pair of features of the projecting element. This doesn't seems to me to be contrary to any assumption which characterizes this aspect of the minimalist program. Moreover, it seems to capture an intuitive property of predication: neither the subject nor the predicate prevail.

All in all, we can go back to our small clause formed by merging *these pictures of the wall* and *the cause of the riot* and assigning the following structure to it, where SC is to be intended in the sense of (17):

(18)   SC

     the cause of the riot   these pictures of the wall
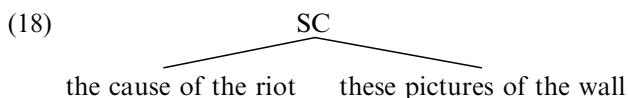
This structure now is a patent violation of the LCA. Consider the following abstract tree:

(19) *   K

         M   P

         N   Q

         n   q
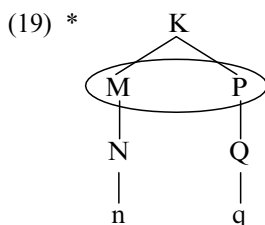
In this tree, M c-commands P and P c-commands M and crucially M c-commands also Q and P c-commands also N. This configuration is a patent violation of the LCA and is sufficient to reject it: n and q would not be linearly ordered.[19] With respect to c-command relations (18) and (19) are essentially the same: the two noun phrases c-command each other. Notice that if we assume Kayne's original proposal this structure could not even be generated. On the other hand, if we now adopt Dynamic Antisymmetry this point of symmetry can indeed be generated, provided that movement intervenes to correct it by introducing an empty category in the potentially offending configuration. This is exactly what we need to explain why either noun phrase must be raised to the precopular position:

(20) a. [these pictures] are [$_{SC}$ t [the cause of the riot]]
     b. [the cause of the riot] is [$_{SC}$ [these pictures] t]

<M, Q> and <P, N>. Now, M contains (N which contains) n and P contains (Q which contains) q. Since hierarchy is mapped into linear precedence by definition, from <M, Q> we have that n precedes q and from <P, N> we have that q precedes n. Clearly, this is an inconsistency.
  [20] This is only one instance of what is generally labelled as A-movement, the other two

Dynamic Antisymmetry can, thus, immediately explain raising out of the small clause. The problems related to the morphological theory of movement are not posed here. More specifically, there is no need to justify covert movement of the noun phrase in the small clause. In other words, Dynamic Antisymmetry seems to be empirically more adequate.[20]

Nevertheless, before offering some other piece of evidence in favour of Dynamic Antisymmetry a residual problem arises that we must preliminarily solve. Consider the following sentence in Italian:

(21) Gianni ritiene [$_\alpha$ queste foto la causa della rivolta]
     (Gianni considers these pictures the cause of the riot)

The complement of *ritiene*, a prototypical *believe*-type verb, has been generally considered as a small clause constituent on a par with the complement of the copula. If the two constituents were identical, we face a counterexample to Dynamic Antisymmetry: one of the two noun phrases should have moved overtly to nullify the point of symmetry, contrary to the facts. This apparent problem can be solved by reasoning as follows.

We know that elements like *in alcun modo* (in any way) are adverbial elements, in fact polarity items that can stay in the spec-position of a functional head, say F°:[21]

(22) . . . [$_{FP}$ [in alcun modo] F° . . .
     (in any way; 'by no means')

being raising from infinitival contexts and movement to spec-IP of either the subject or the object DP out of the VP, in active and passive sentences respectively. Although these can only be the topics of future research, I would like to add a couple of observations with respect to A-movement:

Consider first cases of raising from infinitival contexts such as (i):

(i) These pictures seem [$_\alpha$ t to be [$_{SC}$ t the cause of the riot]]

For independent reasons, I have elsewhere argued (Moro (1997): chapter 4) that α in (i) is also a small clause and that *to* is just a predicative marker of the VP, paralleling the case of *as* for DPs, as opposed to an independent functional head. If this proves tenable then also the further step of *these pictures* would be forced by Dynamic Antisymmetry, since the VP marked by *to* and *these pictures* raised from the small clause would constitute a point of simmetry. For the analysis to be tenable, notice that it should also be shown in the embedded clause of a sentence like *I believe John to be the cause of the riot* there is 'more structure' than in (i) and crucially enough to let *John* raise to a higher spec-position that is not available in (i).

As for raising the DP out of VPs in active sentences, one possibility would be to go back to the early analyses of auxiliaries as specifiers of VPs: if we assume it, then raising of the subject to spec-IP would be forced by the necessity to destroy the point of symmetry as in (ii):

(ii) John I° [$_{VP}$ [$_{XP}$ has] [$_{VP}$ t read a book]]

Notice that this implies that raising does not take place if the auxiliary is absent. Again, whether or not this is tenable can only be proved by a detailed analysis that cannot be pursued here. As for the last case of A-movement, i.e. passive, I have no relevant suggestion to propose here.

[21] See Cinque (1994) and references cited there.

These elements appear to be able to occur in between the subject and the predicate of a small clause like the one we are considering here:

(23) Gianni non ritiene [queste foto [in alcun modo] la causa della rivolta]
        (Gianni not considers these pictures in any way the cause of the riot)

This suggests that the structure which is the complement of the *believe*-type verb is not just a 'bare' small clause as in the case of copular sentences, but a richer construction involving at least one functional projection. Let us now present the same test with copular constructions: if the adverbial element could also appear in the small clause complement of the copula, then we could not distinguish the two cases and (21) would really be a counterexample to Dynamic Antisymmetry. Consider a canonical structure first (see (7)):

(24) Gianni non è in alcun modo la causa della rivolta
        (Gianni not is in any way the cause of the riot)

The adverbial phrase *in alcun modo* can also appear in the copular sentence but this tells us very little. In particular, since the subject has been raised from within the small clause, we cannot decide between (25)a and (25)b:

(25) a. Gianni non è in alcun modo [$_{SC}$ t la causa della rivolta]
        b. Gianni non è [$_{SC}$ t in alcun modo la causa della rivolta]

However, inverse copular sentences can be much more perspicuous. In this type of structures we know that the subject cannot be displaced. Thus, it marks the upper frontier of the small clause. If the adverbial element could appear after it, this would mean that the small clause complement of the copula is also as rich as the small clause complement of the *believe*-type verb. The results are welcome in our present theoretical framework:

(26) a. la causa della rivolta non è in alcun modo [$_{SC}$ Gianni t]
            (the cause of the riot not is in any way Gianni)
        b. * la causa della rivolta non è [$_{SC}$ Gianni in alcun modo t]
            (the cause of the riot not is Gianni in any way)

Clearly, the adverbial phrase must precede the subject of the small clause, unlike the case of the *believe*-type verb. We can then conclude that the small clause complement of the copula does not contain functional projections, as opposed to the complement of a *believe*-type verb which would receive the following representation:

(27) Gianni non ritiene [$_{FP}$ queste foto F° . . . [$_{FP}$ in alcun modo F° . . .
        [$_{SC}$ t la causa . . .
        (Gianni not considers these picture the cause . . .)

All in all, this means that (21) is not a counter-example to Dynamic Antisymmetry. The clausal complement of a *believe*-type verb is a richer

constituent that does not require movement because it does not contain points of symmetry.[22]

Notice that the analysis of the complement of *believe*-type verbs as richer than small clauses can also be independently supported by at least the following two arguments. Consider first the contrast in (28):

(28) a. queste foto, che Gianni non ritiene [$_{FP}$ t (essere) t la causa della rivolta] . . .
(these pictures that Gianni not considers to be the cause of the riot)
b. queste foto, che t non sono [$_{FP}$ t (*essere) t la causa della rivolta] . . .
(these pictures that Gianni not considers to be the cause of the riot)

The infinitival copula (*essere*) can show up in Italian only in the complement of *believe*-type verbs, perhaps manifesting the underlying functional heads ((28)a).[23] This is entirely impossible if we consider the complement of the copula ((28)b) which cannot include functional heads of the same type as in (28)a in it.[24] Consider now the following cases:

(29) a. queste foto sono [$_{SC}$ t la causa della rivolta]
(these pictures are the cause of the riot)
b. queste foto lo sono [$_{SC}$ t t]
(these pictures *lo* are)

---

[22] Similar arguments can be construed across-languages. In English, for example, one can test the distribution of adverbial elements like *hardly*:

(i) a Mary considers John (hardly) the man to talk to
b John is hardly the man to talk to
c the man to talk to is hardly John
d * the man to talk to is John hardly

Again, the fact that the adverbial element cannot follow the subject of an inverse sentence shows that the small clause constitutes which is the complement of the *believe*-type verb is richer than the one which is the complement of the copula.

[23] The subject must undergo wh-movement because infinitival complements with overt subjects cannot otherwise be generated in Italian for Case theoretical reasons, as originally observed by Kayne (1984).

[24] It has been argued that small clauses are indeed generated by (abstract) heads that instantiate the predicative relation (see Moro (1988) and Bowers (1993) among others). Crucially, the empirical argument is based on the fact that the subject and the predicate can be separated by elements like English *as* or its equivalent in other languages like Italian *come*. Now, it seems that if tenable these arguments hold only for the 'richer' type of small clause, namely the complement of *believe*-type verbs. This can be easily shown by noticing that *as* cannot occur in copular sentences like (i), unless it is interpreted as a modifier of the predicative constituent:

(i) John is (*as) the cause of the riot

Thus, the small clause complement is different from the small clause complement of a *believe*-type verb also in that an abstract predicative head seems not to occur in it (see also the discussion in section 3.1.).

It is a well-known fact that predicative noun phrases can be cliticized in canonical sentences by means of the uninflected clitic *lo*.[25] It is also a well-known fact that the same process is blocked by the predicative noun phrases of the complement of *believe*-type verbs. The explanation is now available by assuming the following structure:

(30) a. Gianni ritiene [queste foto F° . . . la causa della rivolta]
     (Gianni considers these pictures the cause of the riot)
   b. * Gianni lo ritiene [queste foto F° . . . t]
     (Gianni *lo* considers these pictures)

The richer structure which has been independently motivated to account for the distribution of adverbial elements can now be exploited to understand the contrast between (29)b and (30)b. The clitic element *lo* cannot be extracted because this would represent a violation of the Head Movement Constraint, as opposed to the case of the copula where *lo* does not cross any head internal to the small clause.

   Eventually, the apparent counterexample to Dynamic Antisymmetry turns out to be eliminated: there is no need for either noun phrase in the small clause complement of a *believe*-type verb to be moved because they do not constitute a point of symmetry. The small clause complement of this type of verb is richer than the 'bare' small clause complement of the copula. Crucially, it involves a head that prevents the creation of a point of symmetry. We can now move on to a different domain which will offer further empirical support to Dynamic Antisymmetry.

3.2. *(Root) wh-movement*

Consider a simple structure like the following:

(31) [IP John reads which book]

This is not a possible English structure. The wh-element must acquire the proper scope, i.e. IP. To do so, it is assumed that a copy of this element is merged to IP as in the following case:

(32) [IP which book [IP John reads which book]]

At the end of this section I will come back to this analysis based on the notion of 'scope'. Let us temporarily adopt this analysis as a first approximation and proceed accordingly. After this scopal process has taken place, the foot of the chain is deleted under the assumption

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[25] There is no contradiction here with respect to the observation made in section 2 that only one noun phrase can be extracted out of a small clause. I have elsewhere offered arguments to analyze propredicative *lo* as a N° as opposed to D° and thus the associated movement as a case of subextraction from within a larger DP which stays in situ in the small clause (see Moro 1987: chapter 1 for a detailed discussion).
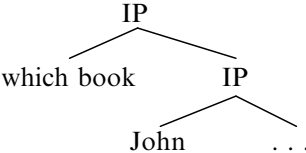
developed in the minimalist program. The result is still an ungrammatical sentence:

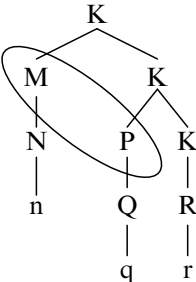(33) * [$_{IP}$ which book [$_{IP}$ John reads ~~which book~~]]

In English, this one-step movement is not sufficient. Although the scopal properties would be satisfied, the object must further raise to a higher position yielding the correct result:

(34) [$_{CP}$ which book does [$_{IP}$ ~~which book~~ [$_{IP}$ John read ~~which book~~]]]

Why? Let us consider this phenomenon from the point of view of Dynamic Antisymmetry. Clearly, the result of the operation that gives the wh-element its proper scope in (32) is a violation of the LCA. Let us focus on the relevant portion of the structure:

(35)

```
            IP
          /    \
   which book   IP
              /    \
          John      . . .
```

The two phrases *which book* and *John* are in a mutual c-command relation, paralleling the abstract configuration discussed in Kayne (1994) where M and P c-command each other preventing the linearization of n and q:[26]

(36)

```
            K
          /   \
        M       K
        |     /   \
        N    P     K
        |    |     |
        n    Q     R
             |     |
             q     r
```

Thus, Dynamic Antisymmetry provides us with an immediate interpretation of why the one-step movement is not sufficient. Interestingly, Dynamic Antisymmetry also offers an independent empirical advantage. Suppose we now want to make an interrogative sentence on the subject. Paralleling the case of the object we Merge the copy of the wh-phrase to IP, providing it with the proper scopal domain:

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[26] For the sake of clarity, recall that in Kayne's theory, c-command is defined as follows: X c-commands Y iff X and Y are categories and X excludes Y and every category that dominates X dominates Y (Kayne (1994): 16) One consequence is then that adjuncts and specifiers can no longer be distinguished and they can only occur once in each maximal projection.

(37) [$_{IP}$ which boy [$_{IP}$ which boy reads a book]]

Again, we delete the foot of the chain yielding the following structure:

(38) [$_{IP}$ which boy [$_{IP}$ ~~which boy~~ reads a book]]

In this case, we obtain a proper sentence: the one-step movement is sufficient. Dynamic Antisymmetry provides the immediate answer. Let us again focus on the relevant portion of the structure (cf. (35)):

(39)

```
              IP
          /        \
  which book        IP
                /        \
         which book      . . .
```
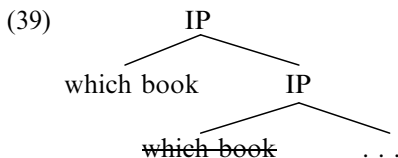
This structure also violates the LCA since it contains a point of symmetry but one of the two offending elements is an empty category thus the structure is tolerated. All in all, Dynamic Antisymmetry derives the subject-object asymmetry in root wh-sentences without further stipulations: object wh-movement needs two-steps because the first one creates a point of symmetry that must be suppressed.[27]

  Before proceeding further into the discussion of wh-movement, I would like to offer an independent piece of evidence to the claim that points of symmetry involving an empty category are tolerated by the LCA. We have so far considered a non-pronominal empty category, i.e. the trace, nevertheless the same conclusion can be given with a pronominal empty category, specifically *pro*. The argument can be reached as follows. Consider the following paradigm (reproduced again from Moro (1988), (1997)):

(40) a. Gianni dice che la causa sono io
         (Gianni says that the cause am I)
     b. * Gianni dice che la causa è io
         (Gianni says that the cause is I)

----

  [27] Notice that if the subject reaches the scope of a matrix sentence, then it behaves like an object requiring the extra step:

(i) who *(do) t you think t left

This can be regarded as a consequence of the fact that *who* and *you* would now violate the LCA. As for wh-movement in embedded questions, we can adopt the standard view that the matrix verb selects the lower head complementizer either overt or null (see Rizzi (1990) and references cited there). If this is so we correctly predict that there is no need to insert an extra head as in the case of root wh-questions:

(ii) I wonder what C° t John read t

In other words, *what* and *John* do not constitute a point of symmetry because there is enough structure, paralleling the situation of the small clause complement of *believe*-type verbs.

The contrast is sharp: the verb does not agree with the preverbal noun phrase. This raises a distinct theoretical puzzle. If we do not want to give up the idea that verbal agreement is made by a spec-head relation, we must say that the spec-position is not occupied by the third person *la causa*. Simultaneously, we do not want to say either that *la causa* is outside IP, since it occurs after the overt complementizer *che*. The solution I proposed to solve this puzzle was to assume that the spec-position is occupied by *pro* while *la causa* is adjoined to IP, yielding in fact a multiple-spec configuration:

(41) Gianni dice che [$_{IP}$ la causa [$_{IP}$ pro sono . . .
    (Gianni says that the cause *pro* am . . .)

Consider the hierarchical configuration so obtained:

(42)

```
                IP
          /          \
    la causa          IP
                  /        \
               pro          . . .
```

This is a potential violation of the LCA: nevertheless, for independent reasons, it is the only plausible solution. The reason why this structure does not actually violate antisymmetry, then, is that one of the two categories of this point of symmetry is an empty category and it is thus tolerated. This conclusion can be counterchecked if we substitute *pro* with its overt counterpart *io* (of course, *io* having the same φ-features of its null equivalent, i.e. first person singular):

(43) * Gianni dice che [$_{IP}$ la causa [$_{IP}$ io sono . . .
    (Gianni says that the cause I am . . .)

In this case, we obtain an ungrammatical sentence. The reason now is that the resulting configuration violates the LCA (because *la causa* and *io* cannot be linearly ordered (and they need it, since they are both overt):

(44) *

```
                IP
          /          \
    la causa          IP
                  /        \
                io          . . .
```

Interestingly, the question arises as to what happens with overt expletives. It seems to me that a relevant empirical domain is offered by the so-called 'multiple-spec constructions' (MSC) studied in Chomsky (1995). Consider for example the following abstract configuration taken from Chomsky (1995:35):

(45) a. * Exp [subj [T^{omax} XP]]
    b. Exp T^{omax} Subj XP

Chomsky notices that the overt order in such construction is not the expected one in (45)a but rather the one in (45)b, that is the expletive cannot appear adjacent to the subject. This unexpected alteration of the linear order can be traced back to independent principles, if we adopt Dynamic Antisymmetry. In fact, the Expletive and the Subject would clearly constitute a point of symmetry in (45)a that only movement can solve. The minimal solution would then be to raise the expletive to a higher spec-position as in (45)b, exactly as in the case of wh-movement of the object in root sentences.

Before concluding, I would like to reconsider the issue of wh-movement. Apparently, Dynamic Antisymmetry appears to be able to derive this type of subject-object asymmetry in root wh-movement, nevertheless a question comes into the open that has been heretofore only latent. Wh-movement turns out to be indeed composed of two sub-parts: one is forced by the search of proper scopal domain, the other is forced by Dynamic Antisymmetry requiring one further step for the object. Can we push Dynamic Antisymmetry to the limit by assuming that wh-movement is entirely driven by it? Or should we just admit that Dynamic Antisymmetry is only a partial explanation for movement? I will try to pursue the first thesis by reasoning as follows.

The minimalist model includes the notion of 'Numeration' which was not available in the previous frameworks stemming from Chomsky (1981). A Numeration is the collection of pairs consisting of Lexical Items (LI) that enter the computation and a number that gives us the number of times that a certain Lexical Item must be selected. Each time a Lexical Item is selected, the index indeed decreases by exactly one unit. What is the relation between Numeration and wh-movement? I would like to propose that the feature [+wh] is nothing but an instruction for the Numeration requiring that the index of the Lexical Item be bigger than 1:[28]

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[28] An alternative proposal to the one based on numeration is currently under elaboration. Pushing Dynamic Antisymmetry to the limit, the idea is that also the foot of a wh-chain can be analysed as including a point of symmetry. Although I will not present the full analysis here let me sketch out the alternative argument. The crucial hypothesis is that, contrary to what is generally assumed, quantifiers and articles differ from wh-phrases in that the latter can be analysed as predicates. From a semantic point of view, this idea is not new (see Groenendijk & Stokhof (1984)): roughly, an element like *what* in *what books have you written* can be associated to a phrase like *this type* in *your have written books of this type*. From a syntactic point of view, I am now suggesting that wh-phrases are to be analysed as predicates of small clauses.

If this matching between semantics and syntax is assumed, the underlying structure of a simple clause like *what books have you written* should receive the following representation:

(i)   you have written [$_{SC}$ books what]

This structure now contains a point of symmetry that must be destroyed (i.e. *books what*). The wh-movement of the wh-phrase would accomplish this task:

(46) a. Numeration = $\{LI_i, LI_j, \ldots LI_k\}$
    b. the feature [wh-] is an instruction for the Numeration
       requiring $i > 1$ for the associated LI

The consequences are not irrelevant: movement of wh-elements proper would now be reduced only to what is affected by Dynamic Antisymmetry. There is no such thing as 'movement for the search of the scopal domain'. This portion of movement is now simple merge of a second copy of the same wh-phrase, as required by the [+wh] feature. In other words, the notion of Numeration allows us to build the scopal component of the wh-movement in it, thus reducing 'displacement' as such to the need for linearization (i.e. satisfaction of the LCA).[29]

  Of course, this would not amount to excluding other conditions on wh-movement, although they would now be regarded (and perhaps rephrased) as conditions on merging. In particular, it may well be that the site where Merge can operate with the second wh-element included in the Numeration must satisfy specific morphological conditions under some version of checking theory. So that, for example, one can exclude merging/displacing of a wh-phrase to a position headed by a non-wh-element, indeed a requirement that must be expressed in any framework.[30]

(ii)   what . . . you have written [$_{SC}$ books t]

Now, although this analysis doesn't seem to fit in English, this immediately offers a natural interpretation of a very productive phenomenon in other Germanic languages which has always appeared to be problematic in the standard account, namely Dutch or German *wat/voor* and *was/für* split constructs. For example, the Dutch equivalent of (ii) would be analysed as (iii)b, where *voor* plays the role of a complementizer, as opposed to the standard analysis in (iii)a given by Bennis (1983):

(iii) a wat heeft hij [$_{NP}$ [t voor] [$_{N'}$ romans]] geschreven
     b wat heeft hij [$_{FP}$ t voor [$_{SC}$ romans t]] geschreven

Interestingly, this perspective suggests that an equivalent of the *wat/voor* and *was/für* split constructs can be observed in Romance languages as well, for example in cases in Italian like:

(iv)   cosa hai scritto [t di [$_{SC}$ libri t]]
       (what have written-second. sing. of books)

If the analysis proves correct, the problematic cases would now appear to be the ones involving pied piping of NP, such as English.

  I will stop here, since I am aware that pushing Dynamic Antisymmetry to such a limit would require a much more detailed discussion. I am indebt to the audiences of the two talks I gave at CUNY and MIT in October 1996 for many interesting suggestions concerning this specific proposal.

[29] We should require this instruction to affect maximal projections only. I will leave this question aside here.

[30] Prototypically, one wants to exclude cases like the following:

(i) * John wonders which book that Mary likes ~~which book~~

where *which book* is merged to spec-CP of the embedded declarative clause.

4. Some consequences and speculations

In this final section I would only like to point to a sketchy list of heterogeneous questions and issues that emerge from Dynamic Anti-symmetry and briefly comment on them. It goes without saying that these are not the only questions that such a hypothesis raises nor that I have arguments to answer them all. In any case, they are representative of the program of research that Dynamic Antisymmetry (DA) would lead us to undertake:

(47) a. Within DA, heads can be complements of heads, provided that at least one head is displaced. Is it enough to predict clitic move-ment?
  b. Can (anti)symmetry be defined with respect to features?
  c. Within DA, what forces movement to be upward?
  d. Are all movements driven by DA?
  e. If movement is a PF-phenomenon, are there other PF-strategies alternative to movement to solve points of symmetry?
  f. Does DA allow parametric variation?

The first question ((47)a) is a typical 'X-bar theoretical' question: in this paper we have limited our analysis to the case of movement of maximal projections, but nothing prevents us from searching other possible sources for points of symmetry. Generating a head as a complement of a head, for example, would qualify as such.[31] Prima facie, it seems that if we do not go under the word-level there should be no other possible sources of symmetry than those linking either two maximal projections (in either 'bare' small clauses or multiple spec-constructions) or two heads:

(48)
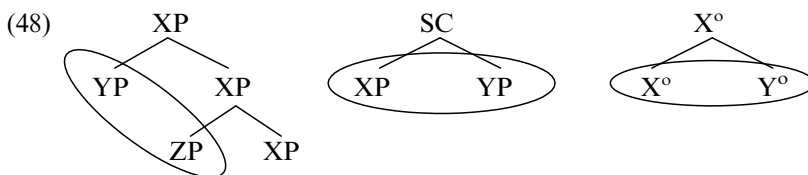
Whether or not this list exhausts all possible points of symmetry, the domains included in it would naturally call for a Dynamic Antisymmetry based explanation.

The first question immediately leads to the second one ((47)b), which is obligatory also in the strong original version of antisymmetry theory: can we define symmetry with respect to features? Although this is surely a

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[31] In fact, similar considerations concerning heads have been put forth by Chomsky (1995) that will fall under the general theory of Dynamic Antisymmetry, if it will be proved correct (Noam Chomsky, p.c.); as for heads and the LCA see also Broekhuis (1995).

crucial question, it seems to me that we are not even provided with an exhaustive taxonomy of features: it goes without saying, then, that the issue of the configuration of features lies far beyond our observation.

The third ((47)c) is not really a question but rather an observation: if movement is to be regarded as the way Universal Grammar rescues points of symmetry, then movement is necessarily upward, since symmetry can only be generated by extending the phrase, i.e. by merging two constituents in a mutual c-command relation. In any case, this appears as a welcome immediate consequence of Dynamic Antisymmetry, since all competing systems must include ad hoc restrictions to avoid downward movement.

The fourth question ((47)d) is the most radical of them all and requires special attention: can all movements by explained by Dynamic Antisymmetry? I do not see any way to answer this a priori: only an empirical inspection of the data can answer it. Moreover, it depends on whether questions like (47)c have affirmative answers. For example, if antisymmetry could be extended to features, i.e. if one could inspect the configuration of features internal to words, then movement could also affect features in isolation with pied-piping phenomena as proposed by Chomsky (1995). Again, I am not aware of any such advanced theory of features. Nevertheless, there are cases that do not necessarily require this type of extensions. Typically, the question arises as to what would drive raising out of infinitival clauses or to what can explain EPP-like phenomena such as subject movement out of the VP. I will not approach these questions here, although in principle I do not see any a prior reason why Dynamic Antisymmetry should not be extended to these cases (see footnotes 5 and 20).[32]

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[32] Interestingly, head movement suggests a further possible extension of Dynamic Antisymmetry. I have so far assumed that movement is triggered by the necessity to destroy a point of symmetry. In fact, I have limited the observation to those cases where movement originates in a point of symmetry. Theoretically, one could imagine the reverse situation, i.e. that movement can also destroy a point of symmetry by moving an object 'in between' the two elements constituting the point. In such a case the point of symmetry would be the target of movement rather than the source, playing the role of an attractor.

Although this hypothesis, which involves countercylic movement (running against the requirement that all movement 'extend' the phrase, in the sense of Chomsky (1995)), surely require a full treatment, it is perhaps interesting to notice that it would naturally account for cases like the following:

(i) a to noone has John t told the truth
    b * to noone John has told the truth
    c * to someone has John t told the truth
    d to someone John has told the truth

Let us assume, following Rizzi (1995), that the left periphery of the clause structure can contain abstract functional heads such as Top° or Foc° but crucially not Neg°. Now, a phrase like *to someone* can surely be hosted in the spec position of a functional head of such a type, while *to noone* certainly not. This would amount to assume that (i)b is ungrammatical because *to noone* and *John* constitute a point of symmetry, whether *to someone* and *John* do

However, apart from the necessity of an empirical inquiry, it seems to me that the following theoretical observations can already be addressed by now as follows. I have so far proposed that movement is forced to correct points of symmetry that would lead to the impossibility of linear ordering. The natural issue arises concerning movement after Spell-out (covert movement). If one maintains that movement is driven by the necessity to present no points of symmetry to the interface with PF, what can be said about covert movement? Surely, we cannot immediately assume that it is needed to allow or even preserve linearization. In fact it is standardly assumed that at the LF interface linearization does not play a role; typically, only c-command does. A priori, then, it seems to me that we are led to two possible approaches. Let us consider them separately.

The first possibility is that there is no covert movement at all. Once the geometry of the tree construed by Merge has been sufficiently adjusted to pass the PF interface conditions, specifically linearization, then there is no further need to change it. This seems to be too strong. One would still like to interpret scopal interactions of say quantifiers in terms of c-domain, i.e., derivatively, of movement, preserving the advantage that interpretation of such entities would be restricted by the same locality constraints independently assumed to account for overt movement.[33]

Let then assume that there is covert movement; how can it be compatible with Dynamic Antisymmetry? Again, it seems that there are (at least) two distinct possibilities. The first, which is clearly the most conservative, is to say that indeed movement is triggered by the necessity to nullify points of symmetry, but that after Select is inhibited by recourse to Spell-out it can still occur. What would force movement, then, after Spell-out? Suppose that nothing does, i.e. suppose that movement is just optional after Spell-out. What prediction would the theory make? Let us concentrate on the case of quantifiers. The prediction is that if a quantifier can move, then it can also stay in situ. In other words, we predict that if a sentence involves movement after Spell-out, then the sentence must be ambiguous. A cursory survey across the relevant literature indicates that there is some evidence in favour of this prediction (see Chierchia (1996) and references cited there). Consider a classic case like *two professors wrote five articles*. Typically, this sentence is ambiguous, depending on whether *five* has been moved to enlarge its scopal domain (yielding the meaning: there are five articles such that two professors wrote them together) or not (yielding the meaning: there are two professors such that they wrote five articles each). Although the hypothesis that all covert movements are just optional cannot be simply

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not, because an abstract head intervenes. Thus, in this case the point of symmetry would be the target of movement (of the inflected verbal head).

[33] This was in fact the original empirical reason for assuming the existence of LF as an independent level of interpretation: see May (1986).

based on this particular case, it is nevertheless important to emphasise that Dynamic Antisymmetry would naturally lead to such a consequence.[34]

Nevertheless, there is also a second possibility to make Dynamic Antisymmetry compatible with covert movement. This alternative to regarding covert movement as optional would require a much more radical interpretation of the fundamental conjecture in (1). The idea would not be that movement is just triggered by the search of antisymmetry but rather that antisymmetry itself is defined only if there is movement. In other words, one could regard the antisymmetrical relation R_2 that is mapped into linear precedence at PF not as defined on non-terminal nodes (as in the case of anti c-command; see the first paragraph of section 3.) but rather on non-null chains. For a certain terminal node x to precede a terminal node y at PF, there should be a chain C_x containing x and a chain C_y containing y such that $C_x R_2 C_y$, whether or not the chain is already established at PF. In this case, both overt and covert movement would just be the same phenomenon. Spell-out being not really relevant. Whether or not this antisymmetrical relation R_2 defined in the domain of chains exists in an empirical matter that cannot be resolved here.

It should be noticed, however, that the two proposals for making Dynamic Antisymmetry compatible with covert movement are not a priori empirically equivalent. If the matching between the linear ordering at PF and the other antisymmetrical relation R_2 could be established at LF, one should expect the arrangement of phrases at PF to be much more free across and within languages. In other words, the regularities that have been known as 'X-bar theory' should be much less visible, if visible at all. For example, what now prevents a head from having more than one complement, say three, is the fact that these complements could not be linearly ordered at PF: more specifically, the hierarchical relation associated with them would fail to be mapped in a unique way onto the set of terminal nodes. If it were possible to wait until LF to establish the proper configuration, we should expect this X-bar restriction to be much less severe. Moreover, the fact that the set of ambiguous sentences is surely a proper sub-set of non-ambiguous sentences across languages independently suggests that covert movement is for some reason not favored with respect to overt movement:[35] this seems hardly compatible with the hypothesis that it plays a crucial role in PF linearization. Thus,

[34] Interestingly, if covert movement is reduced to maximal projections (crucially excluding expletive replacement, as proposed in Moro (1990, 1997: chapter 2)), then all covert movements would just increase the amount of symmetry of the configuration. This isolates a radical difference between pre- and post-Spell-out movements, namely, the decrease vs. the increase of the amount of symmetry, which could now be regarded as corresponding to two natural classes.
[35] I would like to highlight that this appears to be a fact, with no implications for the hypothesis that language structure is functionally organized (or 'selected' in the Darwinian sense).

assuming that movement is essentially forced by PF conditions (and allowing optionality for covert movement) rather than by LF conditions seems to be prima facie more promising.[36]

As for the fifth issue ((47)e), the problem should perhaps be spelled out more extensively. If movement is driven by a PF condition, i.e. linearization, then one could expect other phonological strategies to solve points of symmetry, along with movement. I am aware of only one possible domain of inquiry, namely the stacking of phrases on the high periphery of the clause as in clitic left dislocation, or focus and topic constructions. Indeed the expectations seem to be correct: the configurations that involve stacking are generally affected by such phonological strategies (typically, intonation) across languages.[37] This suggest that this particular instance of 'multiple-spec' configurations yielding points of symmetry can be tolerated at PF, provided that they are marked in an explicit way by PF strategies. Again, this only indicates a possible topic of study, not an answer.

The last question ((47)f) bears on a core matter and one that is presently very much debated. Both Kayne (1994) and Chomsky (1995) agree that parameters cannot be stated in complex formats like, for example, the traditional 'head first'/'head last' instruction. Crucially, cross-linguistic variation must then be established within the lexicon.[38] Just to remain within the domain of verb phrase, let us consider the typical case of the relative order of the object (O) with respect to the verb head (V). All O–V languages would be derivative from the universal V–O order which is the only one compatible with phrase structure, both in Kayne (1994) and Chomsky (1995). In Kayne's framework, the differences in the linear order are traced back to the availability of functional heads allowing the object to cross-over the verb; in Chomsky's theory, instead, everything would depend on the 'strength' of the features involved: [+strong] features require pre-spell-out movement in order to be deleted at PF (O–V languages), while [−strong] features must delay movement under Procrastinate (yielding the V–O order at Spell-out). Can Dynamic Antisymmetry be parametrized? Again the answer to this question requires preliminary answers to other questions, such as the

[36] Notice that one could still try to substitute the anti c-command relation that holds at PF on non-terminals with an antisymmetrical relation defined on chains at the same interface. Antisymmetry, and thus the LCA itself, would then be defined for chains only. I will not pursue this hypothesis here.
[37] A typical example would be the case like the following (the capital letters indicate marked accentuation):

(i) a * a book John reads t
   b A BOOK Johns reads t

where *a book* and *John* constitute a point of symmetry.
[38] Interestingly, the lexicon is intended by Chomsky in the 'rather traditional sense: as a list of exceptions' (Chomsky 1995:235).

one in (47)d. Suppose, however, we assume this has a positive answer, i.e. all movements are driven by the search of antisymmetry. One possibility where parametric variation may lie comes to mind. We have seen that Dynamic Antisymmetry is sensitive to empty categories, in that if a point of symmetry contains an empty category, then it is tolerated. Thus, one could assume that movement is less visible in those languages where the lexicon has more empty categories than others (including, expletives; cf. the discussion concerning the example in (45)). Of course, again, this cannot be the natural place to develop such a hypothesis.

All in all, whether or not Dynamic Antisymmetry, which by now belongs to the realm of mere logical possibilities, will be successful is a matter than can only be answered empirically and it certainly requires future research. By now, the very fact that it raises new questions is, to me, the sign that it is at least worth exploring it.

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