Interfaces in Language

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Edited by

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This volume is dedicated to the memory of Antoine Peretti, who gave us our logo, and to those afflicted by the vile diseases of cancer, lymphoma, sarcoidosis and MNDA. May cures to them soon be discovered and much physical and mental suffering eradicated.

—John Partridge
Whitstable, 2010

PREFACE

JOHN PARTRIDGE,
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The first ***Interfaces in Language*** conference came about as a result of the dissatisfaction expressed at an away-day of the Language and Literature Board of the School of European Culture and Languages at the orthodox distinctions made between the various perceived divisions in language study, e.g. syntax vs. semantics vs. pragmatics vs. phonology vs. morphology, and a wider concept of linguistic interfaces came under consideration, for example language and music, language and politics, languages in mutual contact, languages in mutual conflict, language and literature. It led us to encourage potential contributors at the conference to define and explore the particular interfaces which interested them, to see where there was common ground, where distinctions were to be made and where grey areas invite further investigation. The results were startling: contributors responded from America, Belgium, Brazil, Canada, France, Germany, Israel, Poland, Spain and Switzerland as well as the UK, with themes ultimately grouped under three headings which have been roughly retained in this volume, although alternative constellations will undoubtedly suggest themselves. *Categories and Orthodoxies* addresses some of the most traditional interfaces, as its name implies. *Contact and Conflict* examines clashes and coalescences between languages; languages and politics; the mutual interaction of variants of a language and the imposition or choice of a non-native language over its native counterparts, whilst *Language and Cognition*, which sees language behaviour as partly at least influenced by factors other than those formally identified as strictly linguistic. Many of the wide range of resultant perspectives are represented here, as well as those treated by colleagues prevented at the last moment from attending the conference.

Categories and Orthodoxies

Arguably the most rigid of the formal interfaces, that between syntax and semantics, is addressed by **Isabelle Berlanger**, examining the interface involved in linearity and joint objects and establishing links between logical and phonetic form which allow correct semantic interpretation of phonetic materials despite the non-linearity of their phonetic realisations.

In the context of strict linearity and referentiality, but now introducing a discourse function, **David Tizón-Couto** examines left dislocation in Late Middle English, starting from a theme/rheme perspective, and identifies, dissects and reassembles semantic, informational and syntactic functions.

Virginia Hill and **John Partridge** discuss in their separate yet ultimately similar ways the incorporation of a pragmatic component within language production. Hill envisages a pre-utterance illocutionary component in the syntactic component to account for a sentential adverb preceding the declarative complementiser in Romanian in a manner reminiscent of the Style Disjunct analysis hypothesised by Schreiber (1972), but without setting up the postulation and deletion of a lexicalised performative "Hypersentence" (Ross (1970) and Sadock (1969)), whilst Partridge adds a prosodic feature in discussing an initially plausible alleged complementarity between lexis and accentuation in English versus German, focussing on the basis of context (see Chapman 1998), and establishes a chained sequencing of operations leading from discourse context through discourse intention, simultaneous lexical selection and prosodic accentuation to ultimate utterance.

Further in the prosodic vein, **Ann Delilkan**, working in a minimalist generative mode, establishes in her intricately argued papert hat segmental phonology alone is not able to handle nasal fusion in Malay and postulates that a prosodic component is the determinant factor.

Gladis Massini-Cagliari crosses the diachronic/synchronic divide and addresses the frequently perceived but hardly understood interface between language and music, using prosody in the rhyme schemes and scores of Ancient Portuguese cantos to tease out phonetic values of words which had previously remained hidden.

Contact and Conflict

After **Claudi Balaguer**'s wide-ranging characterisation of variation and the interfaces between and within the languages of the arguably still monocentric Occitan world, **Felicity Rash** makes a strongly documented case to illustrate that despite the deeply-held partisanship of Switzerland's

four language communities exemplified in **Sara Cotelli**'s investigation of the francophone linguistic purism practised in the Swiss Jura, with Jura French seeing itself threatened not only by German but a francocentric form of French, Swiss language policy is now tending to favour the adoption of a fifth language, English, essentially, it would appear, in the advancement and preservation of the nation's interest, with the notion of *Swissness*, nationhood thus overriding deep-seated linguistic, even ethnic, preoccupations. This view was strongly reinforced in discussions following these presentations.

Jon Mills portrays a startlingly different attitude to English, as he sees it a language imposed over centuries on the people of Cornwall, or rather, the ruling English political system suppressing the Cornish language from outside for reasons of political repression and control rather than English being selected from inside by national choice and self-interest, thus engendering an atmosphere in which a language with no remaining native speakers is apparently being artificially resurrected or reinvented for counter-political reasons, inspired by a defensible and certainly understandable feeling of cultural and ethnic solidarity.

Less tendentious positions are reflected in papers where the issue is more of contact than of conflict, of factual tendency rather than determined decision. **Natalie Braber** and **Zoe Butterfint** portray the situation in which inhabitants of and migrants from Glasgow, a city famed for its fierce independence, showing the interaction of English English with Glaswegian English and establishing that migrants are exhibiting linguistic developmental tendencies "in exile" similar to those exhibited by those who have remained.

Dave Sayers looks at the issue of language levelling across three language communities in the South-East of England and finds that despite fears of an ultimate unified vernacular emerging – dialect death – a number of factors are (sometimes counter-intuitively) active in establishing separate linguistic identities and awarenesses, whilst **David Hornsby**'s investigations of vernacular French spoken in the Pas-de-Calais show an insecurity of identity – a feeling at times of pride in local allegiance but also a sense of regional inferiority vis-à-vis the higher status of Parisian, perhaps ultimately a slightly uncomfortable sense of general not-belonging and social rootlessness in immigrants

On the other hand **Christel Nissille**'s paper bears witness to the cheerful multilinguistic insouciance with which the cognate and sometimes misperceived resources of Latin, French and English were combined for the purpose of teaching French to the English in the Late Middle English

period: a true case of contact rather than conflict, perhaps one which in our embattled world we might be well advised to emulate.

Language and Cognition

Finally **Charles Denroche**, the lone survivor from this section of the conference, contributes a thoughtful and meticulously constructed function-based, ideologically unbound, stock-take of what needs to go on in the mind and the resources and skills necessary for the language user to perform linguistically, not purely in the psycho-syntactic "hard-wiring" theoretical model sense, although this can be integrated within it, but in everything that goes on in linguistic behaviour, short of a neurolinguistic account.

Concluding Remarks

The ***Interfaces in Language*** conference: diverse? Certainly. Diffuse? No. The experimental and self-defining nature of the conference and its contributions brought to light many hitherto relatively unsung interfaces, whilst resulting discussions equally revealed unsuspected synergies. Worth it? Definitely! We thought it would be a one-off, but in response to demand we successfully ran Interfaces 2 in May 2009, with Interfaces 3 projected for 2011.

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LINEARITY AND THE SYNTAX-SEMANTICS INTERFACE[1]

ISABELLE BERLANGER

This paper explores the concept of linearity in natural language, considering the opposition between linearity of sound and possible non linearity of meaning. Our main question *How does language manage to linearly encode non-linear meanings?* forces us to work at interface levels, examining from a semantic and a syntactic point of view such concepts as dependence (a main ingredient of meaning) and order (a main aspect of surface form). We approach this question in the framework of generative grammar, by way of branching quantification. Branching sentences*(Most linguists and most philosophers know each other)* display quantifiers that have to be dealt with in parallel, without any ordering (semantic symmetry), in opposition to linear ordering at the surface (syntactic asymmetry). In this case dependence and order appear to be in conflict, an observation that leads us to an extension of the notion of syntactic object. We introduce *twin objects* (in mutual c-command relation) in the syntax, in opposition to "standard" generative theory, and show how those objects allow to obtain the right interpretation at LF interface level, without loss of linearity at the surface. Beyond quantification, twin objects
appear to play a central role in coordination and multiple wh-questions, offering a general tool of representation for linguistic phenomena exhibiting symmetry. In the first section, after a short background on linearity of sound and usual ordering of quantifiers in logical formulas, we come in section 1.3 to a description of branching quantification. In section 2, we transpose the problem in the framework of generative grammar. First we examine the question of word order at the phonetic interface (section 2.1), then we outline the structure of branching sentences at the logical interface (section 2.2), so that we can expose in section 2.3the

[1] The ideas developed here were presented at the international conference "Interfaces in Languages" in April 2007 (School of European Culture and Languages, University of Kent, UK). I am grateful to the audience of the conference and to Thierry Lucas for their valuable hints and comments.

conflict between dependence and order in generative terms, which brings us to question Kayne's Linear Correspondence Axiom (LCA). In the same section we examine coordination and multiple wh-questions, an intensively studied linguistic phenomenon. Section 3 comes to our main point, defining twin objects and coordination, and exposing their use at PF and LF levels (sections 3.3 and 3.4).With twin objects at hand we can then give an elegant solution to the branching problem in section 3.4.2. Finally, in defence of twin objects we show in section 3.4.3, they are extremely useful in the representation of multiple wh-questions. Section 4concludes the paper.

1. Linearity and language

In the formal analysis of natural language, we attempt to extract the syntactic structure of sentences, passing them through the filter of interfaces, to eventually get "sounds" and "meanings". On the one hand, the syntax-phonetic interface deals with the "sound" of a sentence (in particular the ordering of the words at the surface) ; on the other hand, the syntax-semantics interface gives access to its interpretation, generally in the form of a logical formula[2]).1 In this paper we focus on quantification, a main ingredient of meaning. An adequate syntactic structure has to be given for any sentence, even if the requirements at the interfaces appear to be conflicting.

1.1. Linearity and sound

Natural language is linear in its sound. This is a physical constraint on our sentences : there is necessarily a *precedence* relation between the words. This surface order holds the mathematical properties of a *linear ordering* : for any different words A, B and C

(i) *Antisymmetry:* If A precedes B, then B does not precede A
(ii) *Transitivity:* If A precedes B and B precedes C, then A precedes C
(iii) *Totality:* Either A precedes B or B precedes A.

If a set is linearly ordered, its elements can be arranged "in a line", one after the other. This is the case for words in a sentence.

[2] We are dealing here with first order formulas, i.e. formulas of standard predicate logic, with quantifiers on individual variables, first order predicates and relations.

1.2 Linearity and meaning

Is there some sense in ordering meanings just as we order words? In fact, first order formulas present linearly ordered symbols. This is nonetheless not with a view to matching the surface order of the sentence – it is well known that such a correspondence does not exist – but rather to capturing its meaning. As a matter of fact, there is a close connection between the linear ordering of the quantifiers and *dependence* between them, hence interpretation. When two quantifiers appear in a formula, one of them necessarily precedes the other, inducing an embedding of their respective scopes:

$Q1$ precedes $Q2 \Leftrightarrow Q2$ is in the scope of (depends on) $Q1$.

Different orderings of quantifiers lead thus to different interpretations, taking into account natural language ambiguities[3]:

1) MOST PHILOSOPHERS KNOW TWO LINGUISTS

1a′) (MOST PHILOSOPHERS x) (TWO LINGUISTS y) (x KNOW y)
MOST precedes TWO ; TWO in the scope of MOST
More than 50% of philosophers know two linguists, possibly different ones for each philosopher

1b′) (TWO LINGUISTS y) (MOST PHILOSOPHERS x) (x know y)
TWO precedes MOST ; MOST in the scope of TWO
There are two linguists that are known by most of philosophers (maybe not the same philosophers for each linguist)

[3] We will not enter here into the details of formalization, focusing on ordering matters. For a precise formalisation with generalized quantifiers, see among others (Westerståhl, 1989).

Schematically, these two cases are represented by the following situations (with *P* the set of philosophers, *L* the set of linguists, and a link between elements of those sets when the relation *K* of knowing is satisfied between them):

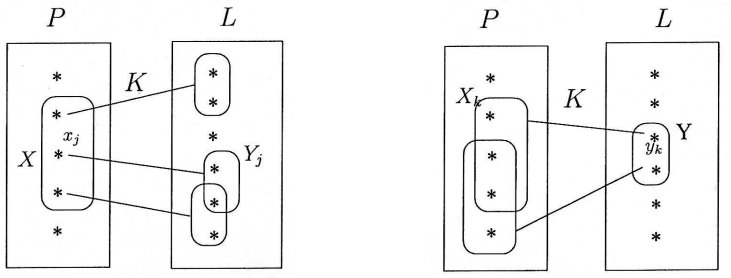


Figure 1. Two cases of linear dependence between P's and L's.

Philosophers and linguists related by the relation *K*, whose cardinalities are given respectively by the quantified expressions *most* and *two*. We obtain a linear dependence of one quantifier on the other when one of those subsets varies with the elements of the other: either the known linguists vary with the philosophers under consideration, or the set of philosophers varies with the linguists.

This close connection between dependence and precedence invites us to transpose the natural linearity of sound into meaning. But why should meaning be restricted to the linear case? The much discussed question of correspondence between surface order and meaning has somewhat put this main question aside. In the lines of schemas here above we could imagine interpretations in which no variation of subsets *X* or *Y* takes place :

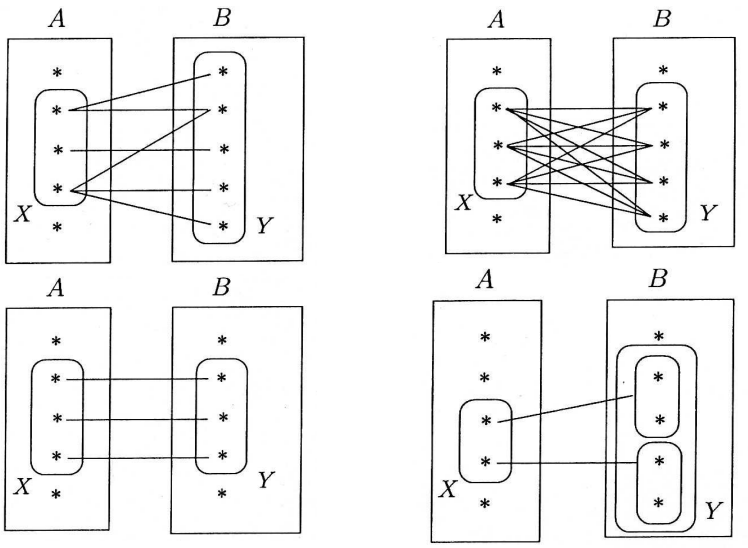


Figure 2. Different types of non linear quantification.

These four situations could respectively be the interpretation of the following four sentences:

2) THREE PHILOSOPHERS FOUGHT, ALL IN ALL, WITH FIVE LINGUISTS.
3) MOST PHILOSOPHERS AND MOST LINGUISTS (ALL) KNOW EACH OTHER.
4) THREE PHILOSOPHERS MARRIED THREE LINGUISTS.
5) FOUR TALES WERE STUDIED, TWO BY TWO, BY TWO PHILOSOPHERS.

In these cases the quantifiers depend on each other in a non linear manner. In sentence 2) we only know there are three philosophers and five linguists entering the relation of fighting, without other precision about its internal structure. In the interpretation of this sentence, the quantified domains *X* and *Y* can be considered separately. In this case the quantifiers are said to be *independent*. In 3), on the other hand, we have more information about the internal structure of the relation of knowing: all members of *X* are related to all members of *Y*. To interpret the sentence, the two domains have to be simultaneously taken into account, in parallel.

This is a case of *complex dependence* between quantifiers. As for sentences 4) and 5), they exhibit other complex dependencies between argumental domains *X* and *Y*, neither linear nor independent. In 4) the relation is one-to-one. The philosophers and the linguists entering the relation cannot be chosen independent of each other; the two domains have to be simultaneously taken into account to capture the relation. The same is true for sentence (5) with a complex one-to-two relation. Generalising the link between order and dependence, we expect these sentences to correspond to formulas where quantifiers are not linearly ordered, in order to avoid embedded scopes which are synonymous with linear dependencies:

Non linear dependence between $Q1$ and $Q2$ $\Leftrightarrow$ scopes of $Q1$ and $Q2$ non-embedded $\Leftrightarrow$ $Q1$ and $Q2$ not linearly ordered

1.3 Branching quantification

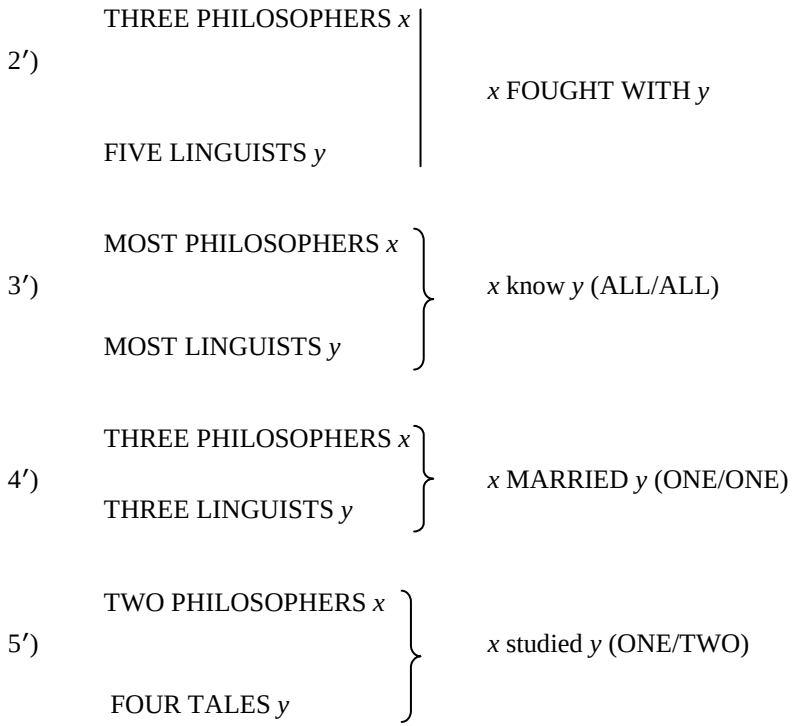
Henkin first proposed extending the first order language to allow for non linearly ordered quantifiers, called *branching quantifiers*.[4] Branching quantifiers are exactly what we need to formalize sentences (2) to (5), which we may accordingly call *branching sentences*. We adopt Sher's notation, putting the quantifiers one under the other, and linking them by a brace to point out the complex relation existing between them:

$$\left.\begin{array}{l} Q_1 \\ \ldots \\ Q_n \end{array}\right\}$$

It is important to note that branching *per se* does not suffice to state what exactly the relation consists of. This could only be specified by the associated semantic definition. To match the intended interpretation we can specify to the right of the formula the internal structure of the relation, if quantitative particularities are known. In borderline cases the different quantifiers are independent of each other, a situation which is denoted by

[4] See (Henkin,1961). In connection with natural language, see in particular the work of Hintikka, Westerståhl, Barwise and Sher.

transforming the brace into a vertical line. Using the appropriate branching prefix, the sentences (2) to (5) can eventually be formalised as follows:



Of the above formulas, only (2′) is equivalent to some first order formulas[5]. In this case the use of branching is called *non-essential*. The other sentences show that essential uses of branching can be found in natural language. These branching formulas express complex relations between quantified domains that *cannot* be reduced to linear combinations of quantifiers.

Now we have to examine how branching can be taken into account in a formal grammar for natural language. Generally speaking, the question is

[5] In contrast to the others, sentence (2) can be formalized by the conjunction of two first order formulas: ((three philosophers x) (exists linguist y) (x fought with y) *and* (five linguists y) (exists philosopher x) (x fought with y)).

to explain how natural language manages to linearly encode non linear meanings. The main point will be to obtain logical forms for branching sentences — in the sense of providing access to the right meaning – while maintaining descriptive adequacy. As a matter of fact, the linguistically minded logician is looking for a formalization that not only leads to the right interpretation, but preserves a maximal amount of syntactic information about the sentence. Logical formulas do not pursue this latter objective; for example the formulas above do not take into account the arrangement of the quantified nominal groups, in particular their possible coordination. Syntactical representations in a formal grammar cannot avoid this difficulty. Linguistic formalisms have to cope with representations of the sound *and* meaning of sentences, making explicit the link between them.

As we are interested in dependence and linearity problems, we have to work within a framework that pays attention to the link between syntactic and semantic questions. Generative grammar, with its Logical Form (LF) and Phonetic Form (PF) interfaces, constitutes such a framework.

In the following we examine how to translate the concepts of order and dependence in generative terms; then we show how the representation of branching leads to conflicting requirements at the interfaces.

2. Linearity and generative grammar

Roughly speaking, generative grammar attempts to derive the logical form LF and the phonetic form PF of a sentence from a base structure proceeding from the lexicon. At each level of the derivation the structure is represented by a syntactic tree satisfying the X-bar theory[6]. PF and LF are the interfaces that give respectively
access to the sound and the meaning of the sentences.

2.1 Phonetic form and order

The surface order of words is given at the phonetic interface PF. It amounts to the ordering of the terminal nodes of the corresponding syntactic tree. But how do we know that this ordering is linear? That question is often obliterated, the order between terminals being taken as a primitive of syntactic trees (A precedes B iff the terminal A appears at the left of the terminal B in the tree). This is not an acceptable position if we want to *understand* the order of words at the surface. As a matter of fact,

[6] According to Chomsky's Minimalist Program. See e.g. (Chomsky, 1995).

the only primitive relation in trees is that of *dominance* between nodes. Unfortunately, dominance cannot discriminate trees regarding the ordering of terminals. The following trees are equivalent; no order is defined between the terminals A and B:

Figure 3. Equivalent trees.

In his seminal work *The Antisymmetry of syntax*, Kayne shows how the dominance relation can lead to a linear ordering of terminal nodes, that is to say an antisymmetric, transitive and total relation. His ordering is based on *asymmetric c-command* (henceforth c>command) and the relation of *precedence* (marked <) Determined by it :

(i) The constituent *A c>commands* the constituent *B*
iff *A* c-commands *B* but *B* does not c-command *A* ;
(ii) When a node *A* c>commands a node *B*, each terminal *Ti* dominated by *A precedes* each terminal *Tj* dominated by B (a statement supported by good linguistic intuition):

Figure 4. Precedence relation between terminals.

Unfortunately, the relation < just defined is not a linear ordering: it is no longer antisymmetric or transitive, and it is not even total. This can be observed in a tree such as in Figure 5, where (i) $E < G$ (since *A* c>commands *D*), but also $G <$ E (since *B* c>commands C); (ii) $E < G$, $G <$ F but $E \prec F$ and (iii) *E* and *F* are not related by < (since each one c>commands the other). For details on these definitions and properties, see Kayne (1994, ch.1)

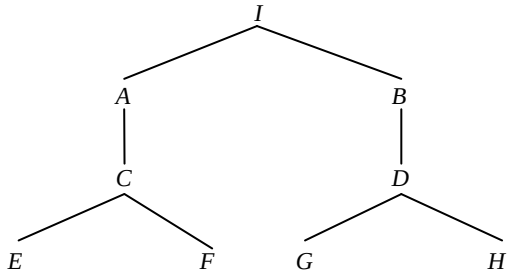


Figure 5. Result of redefined <

Eventually, Kayne imposes a strong constraint on syntactic structures to make the relation < a linear ordering. This is the very meaning of his *Linear Correspondence Axiom (LCA)*: from now on, trees have to put terminal nodes in relation in an antisymmetric way; too "symmetrical" trees have to be rejected:

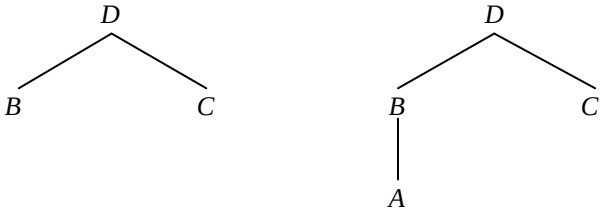


Figure 6. Non-admissible *vs.* admissible tree.

Note that, following LCA, this tree furnishes the same order at the surface as the fully equivalent tree

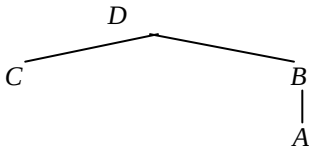


Figure 7. Equivalent tree.

What are the consequences of LCA for generative minimalist grammar trees? Kayne shows that X-bar syntactic structures satisfy the axiom LCA, with the result that standard maximal projections composing the trees (*XP* with one head *X*, one specifier *SpecXP* and one complement *CompXP*)

give the expected order between terminal nodes, and hence the expected word order in the corresponding phrase: *Spec-X-Comp*[7].

The idea is that we can cut sentences into major constituents in a specified order, next in sub-constituents, and so on. That procedure will furnish syntactic structures which in turn will give access to meaning. There is thus a close link between phrase structure and word order, between dependence (c>command) and linearity, a result in the same vein as the link between dependence and order into logical formulas. Recall that branching interpretations forced us to escape linearity, extending our logical language to branching quantifiers. We have now to examine how to cope with branching structures in generative grammar.

2.2 Logical form and scope

At the level of logical form LF, we have to know the scope of all operators in order to get the right interpretation for a sentence. In generative grammar, the scope of quantifiers is fixed by c-command domain after raising in scope position (P&P theory). Multiple quantification goes with multiple raising at LF, resulting in embedded scopes: the higher the position, the larger the scope. Dependence is thus directly translated in the hierarchy, by way of c-command:

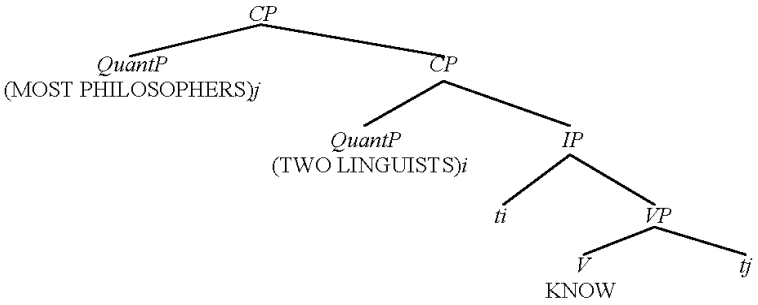


Figure 8. (TWO LINGUISTS) in the scope of (MOST PHILOSOPHERS)

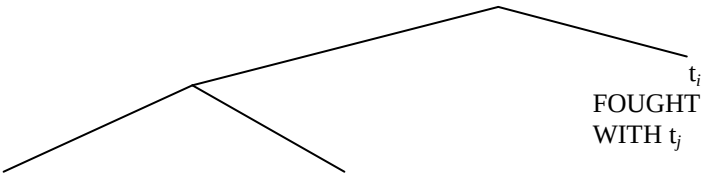
[7] The strength of LCA is to explain properties of X-bar structures which were formerly taken as primitives, thereby giving a better foundation to generative grammar. For a detailed critique of LCA and its connections with X-bar theory, see (Abels & Neeleman, 2007).

Now recall from section 1.2 that non linearity in meaning is independence or complex dependence between quantifiers, that have to be treated on a par. Along those lines, branching amounts to *mutual c-command* between quantifiers at LF[8].

Non-linear dependence ⇔	non-embedded scopes ⇔	mutual c-command
between *Q*1 and *Q*2	for *Q*1 and *Q*2	of *Q*1 and *Q*2 at LF

The logical form of (2) would then be something like

2)



QuantP$_i$ *QuantP*$_j$
THREE PHILOSOPHERS FIVE LINGUISTS

But this is just the situation prohibited by LCA. Non-linear dependence goes with some symmetry at LF, but symmetric structures are inadmissible because they prevent defining an order between the terminals.

2.3 The branching conflict

Translated into generative terms, the opposition between "linearity of sound" and "non-linearity of meaning" amounts to a conflict between syntactic asymmetry (at PF) and semantic symmetry (at LF). Interestingly, this conflict does not concern only quantification. It appears to be a central issue for other linguistic phenomena, in particular coordination and multiple wh-questions.

In coordinate sentences,

[8] For a similar position, see May (1985).

6) [PHILOSOPHERS] AND [LINGUISTS] WERE PRESENT,

one conjunct necessarily precedes the other at the surface, but the asymmetric c-command that renders this situation cannot hold at LF : both conjuncts have to receive the same status (licensing, marking, μ-role, etc.), which would be impossible if one conjunct c>commands the other.
As for multiple wh-questions,

(7) [WHO]+$_{Wh}$ READ [WHAT]+$_{Wh}$?,

the two [+*wh*]-domains cannot be embedded into each other, because (7) amounts to simultaneous questions. LF is hence symmetric, but PF is not : an order has to be respected at the surface, and for this purpose one wh-constituent has to c>command the other.

Alan Munn, working on coordination, stated the problem clearly with this question:“ How is an asymmetric syntax mapped into a symmetrical semantics?”[9]. Faced with this problem we can proceed in different ways.

First, we could give absolute priority to interpretation, renouncing LCA for good. Different authors are working in that direction, in particular Abels & Neeleman (2007) who show how antisymmetric structures for X-bar theory may be obtained without the use of LCA. Along that line there remains the problem of obtaining
symmetric structures (for branching and coordination) and their linearisation at PF. The LCA has the merit of pointing at the very link between dependence and linearity which is here our main concern; that is the reason why we do not want to abandon it.

In the opposite direction, we could give an absolute priority to description, preserving an asymmetric structure for all levels of representation. This is in fact the actual position of standard generative theory, based on LCA. On those grounds, branching sentences cannot be correctly interpreted, which cannot be accepted.

Another possibility is to adopt a mixed system, abandoning LCA at LF level. In that case we would still have to examine how to obtain – by some operations to be properly defined – a symmetric logical form from an asymmetric base structure.

That is the point of view of Munn (1993) and to some extent of Johannessen (1998), which they developed for coordination ; however

[9] Alan Munn’s homepage, 2004.

their techniques are quite heavy and not easily adapted to quantification. This solution could also be rejected following Kayne's homogeneity argument according to which LCA founds all the restrictions on phrase structure familiar from X-bar theory, and must therefore be applicable to all levels of representation. Along that line the weakening of LCA is for us a better solution than its rejection.

A fourth possibility consists in *weakening* LCA on the whole syntactic representation, allowing local transgressions on particular constituents. That is to say we accept symmetric constituents at any level, creating locally non-linear islands. That is the point of view we develop in the sequel; it allows us to preserve the homogeneity of syntactic representation and to maintain a link between dependence and linearity, which is essential if we want to take branching into account.

It has been brought recently to our attention that other authors have used an approach similar to ours. Such is the case of Moro (2000), who proposes a weak version of Kayne's antisymmetry restricting LCA at PF level[10].Here are a few elements of comparison, without entering into details. Moro's *Dynamic Antisymmetry* admits symmetric structures before PF (called *points of symmetry*), which are linearised at PF by movement (symmetry triggers the movement). Connecting phrase structure and movement theories, Moro's results are very interesting, in particular for coordination : one will easily obtain surface linearisation of coordinated structures (by movement of one of the conjuncts) without breaking theirinterpretation. However, some usual movements are not much discussed by Moro, for example the raising of quantifiers. Branching will then be difficult to explain because movement and preservation of symmetry are incompatible in his system, a problem that needs further investigation.

We now turn to our solution, putting forward its strong points, which we think give an adequate solution to the initial problem of conflict between semantic symmetry and syntactic antisymmetry.

3. Twin objects

The three preceding sections support, we think, the following somewhat unusual hypothesis: syntactic structures may comprise symmetric constituents in violation of the LCA. We name them *twin objects*. Twin objects are not to be considered as a default of some odd structures or as a failure that further research would eliminate, but as

[10] Thanks to the anonymous referee for this relevant reference.

genuine and well-defined syntactic objects, entering the derivations as any other ones. They are the common point linking branching, coordination and multiple wh-questions. We first define them, then show how they are used in coordinated structure, triggering the expected phonetic and logical forms.

3.1 Definition

We define a *twin object* of category *X* (denoted by *X*(2)) as the result of merging two constituents of the same category *X* and same bar level :

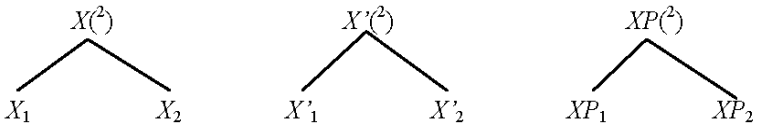


Figure 9. Definition of twin objects.

If necessary the explicit notation (X_1; X_2) is used to make apparent the components it is made of.

Twin objects behave like any other usual syntactic object. They are formed by merging two constituents simultaneously selected[11]:

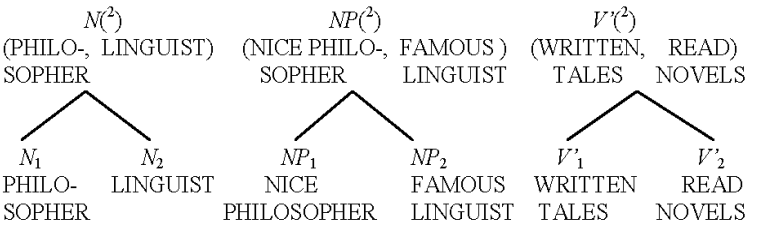


Figure 10. Twin objects with various levels of projection and categories.

[11] In their definition and formation twin objects are equivalent to Moro's points of symmetry. We are happy to note that quite different problems (small clauses, wh-extraction and clitics for Moro; branching and coordination for us) find a similar solution, based on the necessity of symmetric structures inside syntax. A more detailed study could examine the differences in the constructions and their implications, e.g. our twin labelling vs. Moro's lack of projection.

After entering the structure twin objects can spread by merging with other, single (*i.e.* non-twin) constituents. Merging with a twin constituent amounts to merging with each of his components. In this way a new, more complex twin constituent can be formed, whose category depends on the categories of the components by the usual projection rules. For example[12] :

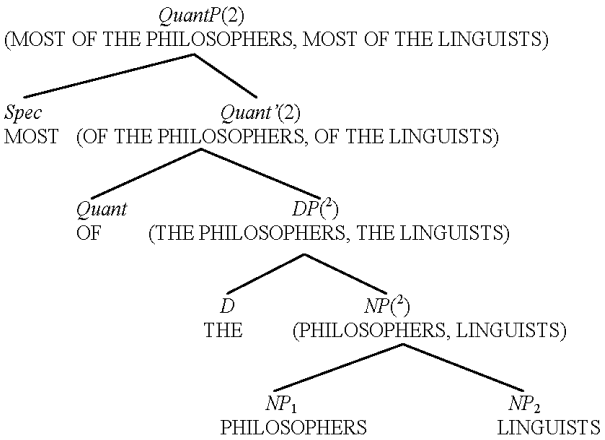


Figure 11. Spread of a twin object in syntactic structure.

3.2 Coordination

By definition, twin objects give rise to a violation of the LCA, for their components are in amutual c-command relation. Consequently no order can be defined between them, a situation that cannot be accepted at the PF interface. Acceptance of twin objects thus entails the existence of an operation which would *reduce* them to single objects, in order to get a globally linear structure at the surface. Now this is exactly the role of coordination: a conjunction is nothing but an operator making one single

[12] In my thesis (Berlanger, 2005), I consider a quantified *NP* (labelled *QuantP*) as an extension of *DP* whose quantifier (here, most) occupies the Spec position. See for example (Giusti,1997) for a similar analysis. The detail of the labelling does not matter here, the important point being the presence of twin quantified phrases.

object from two. From now on, we propose to see a coordinate structure as the result of putting a twin object in the scope of a conjunction[13].

We have now all the ingredients to define coordinate structures. We make the hypothesis that coordination is adjunction of a conjunction *Co* to a twin constituent $X^{(2)}$, creating from the two conjuncts X_1 and X_2 a single constituent *X* of the same category and the same level:

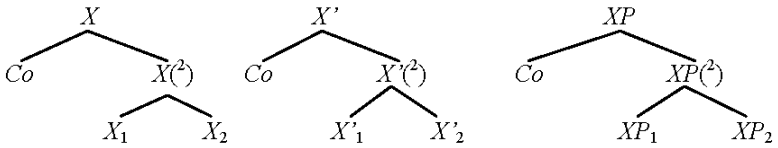
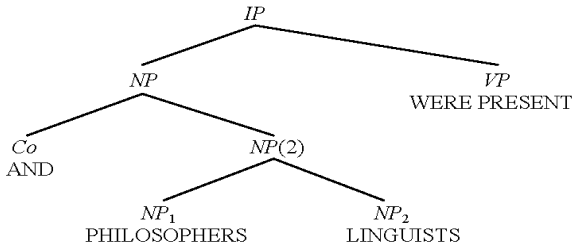


Figure 12. Adjunction of *Co* to a twin object.

Accordingly the structure of (6) is

6)



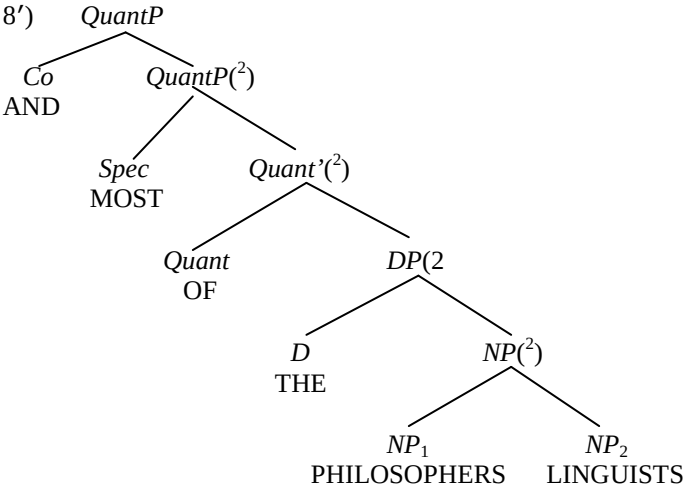
Coordination always applies to a twin object, directly as above or indirectly after the spread of a twin object in the structure. We can for example obtain

[13] According to this proposal, we think of the conjunction as an operator, as much as quantifiers, wh-words and negation, with which it can interact. See Camacho (2003, p.37) for an opposite point of view.

(8) [MOST OF THE PHILOSOPHERS AND MOST OF THE LINGUISTS]$_{ZP}$

from the twin head [(PHILOSOPHERS, LINGUISTS)]$_{N}^{(2)}$ by indirect coordination, after the spread of the twin object and adjunction of AND :

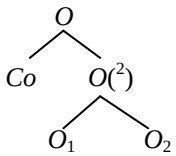
8′)



The challenge is now to show that twin structures will allow us to reach (i) the right surface word order, and (ii) the expected non-linear meanings, in particular the right interpretation for branching sentences.

3.3 PF with twin objects.

We have to explain how a symmetric coordinate structure like



is eventually read with the correct linear order. Recall that to know how to read a coordinated sentence, we have to examine the c>command relations