Two advantages of precedence syntax

Michael Brody

1. Precedence

A sentence on a very first approximation appears to be a string of words. But as introductory syntax classes invariably demonstrate, it has more structure than this. Some adjacent words are more tightly bound together than others, and some units of tightly bound word sequences are again more tightly bound together than others. Such observations can be captured in terms of a postulated hierarchical structure, for the existence of which much additional evidence has been provided.

A sentence as a string of words (or of morphemes or of lexical bundles of features etc.) is a linear order of words and a hierarchical structure is equivalent to a partial order of containment or domination. Modern linguistics has assumed that both of these two types of orders are necessary to characterize sentences. Within the generative framework it has been realized quite early that a theory with two very similar core primitives is probably not optimal. Reinhart's (1976) characterization of the notion of c-command, which appeared to make reference to linear precedence unnecessary in syntax, made a modular approach possible. The solution has been to distinguish a syntactic component that uses only the orders provided by containment and a spellout component that translates the syntactic hierarchy into a linear sequence of words. Although this solution to the --at least implicitly recognized-- problem of the two very similar primitives was generally accepted, it is less than optimal. In fact, one might wonder if it is a solution at all.

At about the same time there were proposals that argued that movement relations should be assigned to the semantic component on the sole ground that such a move would simplify syntax. These were immediately and rightly rejected. The proposed reassignment would not simplify grammar as whole; --a simplification in one component is no achievement by itself, if it entails a corresponding complication in another.

It is easy to see, at least in retrospect, that the proposal to shift linear precedence relations from syntax into a spellout component suffers from the same basic problem: it simplifies syntax at the price of complicating another component. Hence it provides no simplification for the overall system, which continues to include two very similar primitives. One might hope for an advantage in terms of modularity: perhaps the two concepts of precedence and dominance indeed pertain to two different subsystems of grammar. But the original problem of the two similar primitives within one component of the grammar resurfaces either in the spellout component or in a separate third component of syntax-spellout matching. Some algorithm needs to refer to both types of orderings. since the precedence order of words and the syntactic hierarchies, which constrain these precedence relations, must be related.

In the present context we can think of Kayne's antisymmetry hypothesis (1994) as an attempt at damage limitation. Under the antisymmetric approach, although both hierarchical and precedence orderings are retained, the latter ceases to be partially independent, as it is taken to rigidly express certain aspects of the hierarchy. The assumption that precedence is dependent on hierarchy however does not solve the problem of why we have two such similar ordering relations at the core of our theory. The idea that one of the two nearly identical ordering concepts simply translates aspects of the structure that is constructed in terms of the other one, if anything, makes the lack of elegance in using both concepts even more pronounced.

It is undesirable then, to use both precedence and dominance orderings in our theory of grammar. While it is unproblematic to define linear precedence in terms of the dominance hierarchy, an approach that completely dispenses with the notion of precedence would clearly be unable to achieve minimal observational adequacy. But there is no need to look too far for a concept that can usefully subsume linear precedence and dominance relations, since unlike dominance, precedence itself is quite up to the task. Nothing prevents understanding the syntactic partial linear order provided by domination relations *as* a partial linear ordering by precedence, thereby eliminating the concept of dominance using the apparently inevitable concept of precedence. This is the assumption I adopt here, --that dominance hierarchies are in fact precedence hierarchies.

To project a single linear order (the spellout string) assume that the spellout string consists of all categories in the tree and not only of terminals. The syntactic precedence-tree provides a partial precedence order. In order to have a full linear order for the spellout string, additionally also sister nodes need to be ordered with respect to each other. The minimal assumption, which I adopt here, is that the order of sisters is in principle free with respect to each other. (Hence while syntactic precedence entails spellout precedence, the converse does not hold.) The lack of a fully general universal ordering principle for sisters both in syntax and in spellout means that restrictions on the precedence relations in the spellout string between sisters are accounted for by, presumably parametrized, principles that have language or construction-specific effects. In other words unlike antisymmetric approaches that postulate a rigid spec-head-comp order and account for symmetries by modifying the antisymmetric structure that they take to be the basic one, I take the breaking of symmetries and not the symmetries themselves to be in need of an explanation.

While sister nodes may in principle be in either order with respect to each other in the spellout string, their ordering clearly must in general respect constituency relations. In other words if A and B are sisters then A may precede or follow B, but in general A cannot interrupt B, --that is A cannot intervene between constituents of B. It is interesting to note that it is in fact not necessary to refer to the notion of constituency to ensure that the spellout of sisters respects constituency. In precedence syntax if A precedes B in syntax then A precedes B in spellout. Given that syntax is a partial ordering we cannot assume in general that if A immediately precedes B in syntax then A must immediately precede B in spellout. This would rule out sister nodes, where A immediately precedes both B and C in syntax, --since A clearly cannot immediately precede both B and C in the linear order of the spellout string. But we may still adopt the stronger requirement of conserving immediate precedence by some category A with respect to categories not dominated by A. In other words we may require that if A immediately precedes B in syntax then X can intervene between A and B in spellout only if A precedes X (also) in syntax. As can be easily seen, such a restriction ensures that sister nodes cannot interrupt each other, and therefore that their spellout order must respect constituency relations. While this reformulation is not strictly relevant for the issues to be discussed below, it may be important for one dimensional syntax, --the stronger version of precedence syntax that eschews syntactic reference to constituency relations entirely (Brody 2015).

2. Symmetry

The order of the verbal or nominal functional categories is typically mirrored by the verbal and nominal suffix orders (Baker 1988). In mirror theory (Brody 1997, 2000) it was assumed that this symmetry is due to the syntactic and the morphological complement relation mirroring each other's linear order. In other words, in this approach morphology was taken to express syntactic functional category (sub-)sequences in inverse, mirrored, order. Later work by Cinque (2005, 2008), Wurmbrand (2004), Abels and Neeleman (2012), Abels (2013), Neeleman (2015) and others suggests that this symmetry is part of a much wider phenomenon, that encompasses also cases where apparently the same type of symmetry phenomena show up with phrasal categories. Mirror theory could capture some aspects of this larger generalization (see Brody and Szabolcsi 2003, Adger et al. 2008), but without major modifications it cannot straightforwardly capture all the phenomena the generalization covers.

Cinque (2005, 2008), who carefully discusses and analyzes a wide array of typological data related to Greenberg's universal 20, proposes that the underlying order of modifiers, like Demonstratives, Numerals and Adjectives, is fixed in the noun phrase. This is observably Dem-Num-A(-N) in cases where the noun follows these elements, --corresponding to the order of the matching functional projections.

But the mirror symmetric order, N-A-Num-Dem is also possible and is in fact a common one in natural languages. In fact Dem, Num, and A each may be on either side of the noun when their relative order respects the Dem Num A N template order on the left or its mirror image on the right. So in the NP spec's on the right stack up in the inverse of the basic order on the left:

(1) Det Num A N <--> N A Num Det

We see the same mirror symmetry not only in suffixation but also in the verbal domain. The mirror symmetry of verbal clusters (eg. Wurmbrand 2004, Brody 2004, Abels 2013) has been well-known for some time.

(2) dass Hans schwimmen können müssen wird <-->
'that John will have to be able to swim'

Sometimes the symmetry is observable even language internally. For example as Neeleman (2015) points out, citing earlier observations, in non-root environments the preferred neutral order among postverbal PPs is the reverse of their neutral preverbal order:

(3) PP1 PP2 PP3 V <--> V PP3 PP2 PP1

(4) a. dat hij [[door een stuurfout]3 [met een knal]2 [op het hek]1 stranddeV].
that he by a steering-error with a bang on the fence got.stuck
'that he got stuck on the fence with a bang because he made a steering error'
b. dat hij [stranddeV [op het hek]1 [met een knal]2 [door een stuurfout]3]
that he got.stuck on the fence with a bang by a steering-error"
(example from Neeleman 2015)

In antisymmetric approaches these mirror symmetries are most often treated in terms of a roll-up structure. Cinque for example takes the mirror image order N-A-Num-Dem in the nominal domain to be derived by N moving to precede A, N+A moving to precede Num and N+A+Num moving to precede Dem, --resulting in the N-A-Num-Dem order. Unlike with roll-up head movement, there are no problems here with c-command, although under such analyses movement theory needs to be weakened in certain non-desirable ways as Abels and Neeleman (2012) demonstrate.

The approach shares with head movement the curiosity of explaining symmetry using non-symmetric means. But again, it is not symmetry but the lack of it that requires explanation. In the concrete cases at hand, symmetry essentially comes for free if, as in precedence syntax, we do not stipulate the order of the specifier and the head and assume that their spellout ordering respects constituency, perhaps due to the immediate precedence conservation requirement discussed in the previous section.

We would need a constraint to eliminate this symmetry if it did not obtain (and we need one where it does not) and then such a constraint will be in need of an explanation. But it seems strange to have a theory that provides a mechanism that creates a non-symmetric structure in an effort to explain the lack of a complication;--one that allows symmetry to be undisturbed.

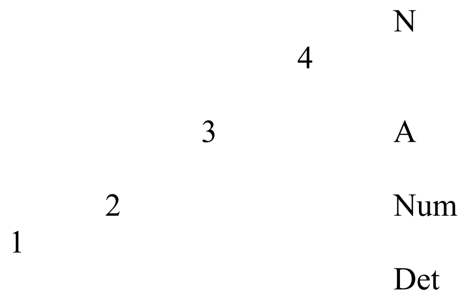
3.Asymmetries.

What is in need of an explanation is the fact that (a) there are some possible neutral asymmetric orders before, but not after the head, that do not correspond to the order of the functional categories or to its mirror image and (b) as Neeleman (2015) argues convincingly, under certain circumstances, some of the orders corresponding to the order of functional categories are systematically missing before the head and are possible only after the head, in the mirror image version. Since the former type of asymmetry is in accordance with the well-known Greenberg universal and the second one seems to go against it, Neeleman refers to these as U20 and anti U20 asymmetries respectively.

Let us look at the U20 asymmetry first. As Abels and Neeleman point out in connection with Cinque's analysis of the NP, all possible functional sequence violating neutral orders and none of the apparently impossible ones in Cinque's catalogue can be derived on the twin assumptions that neutral orders can only be changed non-symmetrically into another neutral order by an operation that moves some constituent including the noun, and that all movement is to the left. If we took the functional category sequence internal movement (movement of a constituent dominated by lower category of a functional category sequence to a higher category of the same sequence) to be free in principle, and movement that involves more than a single functional category sequence to require a (non-neutral) triggering feature, then it will follow that in the NP only movement of a category including the noun will result in a neutral order. (To deal with verbal clusters in a parallel fashion some notion of extended functional sequence will be necessary. Note also, that we will need a parametrized set of constraints perhaps along the lines of Starke's (2010) appropriately adapted to the present framework, on when these free functional category sequence internal movement operations will actually obtain.)

The requirement that movement is to the left clearly misses a generalization in the context of the requirement that movement must be to a structurally more prominent (dominating) position. The problem arises independently of whether the leftness requirement on movement is taken to be a syntactic or a processing condition. As noted earlier in the context of the one-dimensional framework of Brody 2015, the apparent missed generalization can be avoided in a precedence syntax. We understand " x 'c-precede' y" to mean, that the category immediately preceding x (the 'address' of x) precedes y (or perhaps the address of y). The c-precede requirement will ensure both that the antecedent must c-precede the ’trace’ in the tree (ie. in standard terms it must be higher) and that it must c-precede it in the spellout string, hence that it must precede linearly. Take for example a tree like (5), where 1 immediately precedes Det and 2, 2 immediately precedes Num and 3, 3 immediately precedes A and 4, and 4 immediately precedes N.

(5)



If N ’moves’, it must reattach to a node that precedes it, here of these nodes 1,2,3 and 4 are shown. This corresponds to the standard c-command requirement. Specifiers may then in principle occur in the spellout string either on the left or on the right of the head N in the most embedded position in (5), --a ’trace’ if movement occured. But unlike Det, Num and A the reattached N, the antecedent in its chain, cannot make use of this freedom. If the reattached N occured on he right then the requirement that the address, (the category immediately preceding the antecedent), precede the anaphoric element in the chain would be violated in the spellout string. Whether or not this version of the constraint ultimately proves correct, this suffices to indicate that precedence syntax provides the means to capture the generalization that is otherwise elusive in a symmetric framework over precedence and c-command.

Let us turn to the other type of asymmetry, where orders corresponding to the order of functional projections are systematically missing before the head and are possible only after the head, in the mirror image version. As Neeleman (2015) observes „OV languages in which adverbs precede the verb systematically allow both Adv-O-V order and O-Adv-V order. This alternation can be observed in Afrikaans, Armanian, Assamese, Basque, Bengali, Dutch, Frisian, German, Georgian, Hindi, Japanese, Kannada, Kiowa, Korean, Lezgian, Malayalam, Pashto, Persian, Quechua, Sakha, Tatar, Tsez, Turkish,Uyghur and Uzbek.” The general availability of this alternation leads him to the assumption that argumental and adverbial functional heads are ordered separately and have no fixed order with respect to each other. If so, then we expect that not only preceding but also following the verb both (mirror image) orders V-Adv-O and V-O-Adv. This expectation is not fulfilled: „There is considerable variation in VO languages, but typically only V-O-Adv order is permitted when one controls for factors that may independently lead to separation of verb and object. The main complication in ascertaining that VO order correlates with absence of adverbial intervention is that verbs may move leftward, away from the object and across adverbials.” (Neeleman 2015)

To account for this asymmetry, Neeleman proposes his *“Case-First Constraint”* version of the Case Adjacency requirement that disallows any category linearly intervening between the Case assigning head and the Case marked DP but only if that intervener precedes the DP. This proposal, however, leaves the problem of asymmetry unsolved; -- why is it that only preceding interveners (rather than all interveners or only following ones) matter. Neither antisymmetry nor Neeleman’s (2015) symmetrical approach explains why Case assignment adjacency is asymmetrical and why it prefers the ‚right side'.

Precedence syntax again provides an immedate explanation. Suppose that the V-O(bject)P order is forced by the Case adjacency requirement,--a condition that entails V (or its trace) and OP have to be adjacent in the spellout string. In the syntactic precedence tree, (6a) the category F' that immediately precedes the OP also immediately precedes the sister of OP, a category F that immediately precedes the verb, --as in (6b). (This assumes of course that the object is the daughter of some functional element F' and is not the sister of the verb.)

F V
(6)a. F'
O

b. F' > O(P), F' > F(P), F > V

In principle the sisters OP and FP may be taken to be in either order for the spellout string. But if V and OP have to be adjacent, then FP must precede OP, since if OP precedes FP, then F (which precedes V) will necessarily intervene between OP and V preventing the required adjacency.

(7) a. F' > O(P) > F(P) > V (*, F intervenes between OP and V) or
b. F' > F(P) > V > O(P) (V – O(P) adjacency respected)

Notice that the order F' > F > OP > V is not a possible alternative to (7a) since it does not respect constituency relations. As discussed in section 1 above, syntactic sisters can be in either order with respect to each other in the spellout string, but they cannot interrupt each other. If A and B are syntactic sisters A cannot intervene between constituents of B.

(This will in fact need to be systematically weakened by adopting an appropriate version of relativized minimality if we include, as seems natural, an account of suffixation-adjacency along similar lines. The necessity of such a weakening appears to provide evidence for the statement of the relevant restriction proposed in section 1 in terms of interveners rather than in terms of constituency.)

Hence in precedence syntax it follows from natural and largely uncontroversial assumptions, that in languages where the Case adjacency requirement holds, the object will always follow the verb.

In sum, precedence syntax appears to have the potential to explain the two major asymmetries that arise in approaches that do not redundantly attempt to account for symmetry phenomena.

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