

The Place of Linear Order in the Language Faculty

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1. Introduction.

In support of their claim that “order is only established in the morphophonological component”, Chomsky et al. (2017) (henceforth CGO) argue that “no syntactic operation can make reference to it”, i.e. to linear order. I return to this argument below, after addressing another argument that they put forth, related to the fact that “Languages differ in how they ultimately linearize objects constructed by MERGE”, combined with the fact, illustrated by Japanese OV vs. English VO, that “Interpretation is not affected by this difference” in word order.

If Kayne’s (1994) antisymmetry proposal is correct in its essence, then the question of the possible effect of order needs to be recast, insofar as there can be no order difference, given antisymmetry, that is not accompanied by a difference in hierarchical structure. Japanese OV and English VO must differ in more than just order; the O in Japanese OV must asymmetrically c-command V, whereas in English that cannot be the case. Thus if there is no difference in interpretation, it must be the case that not only does the OV/VO order difference itself have no interpretive effect, but also that the hierarchical difference between Japanese OV and English VO has no interpretive effect.

From an antisymmetric perspective, this last point is closely related to another question, alluded to by CGO (cf. Cinque (2018)), namely the question of “semantically vacuous scrambling”, where there is by assumption a hierarchical difference between the ‘scrambled’ and ‘non-scrambled’ structures, yet no apparent interpretive difference. CGO take it to be an open question whether operations such as scrambling “reflect narrow-syntactic computations or are part of the mapping to PHON”. I will set this question aside for the most part, apart from noting the link between it and the familiar question of uninterpretable elements such as expletives and agreement morphemes. Though if what follows is on the right track, then scrambling and similar operations are very likely to be part of ‘narrow syntax’.

2. Antisymmetry

CGO seem to take it for granted that Japanese OV and English VO could differ solely in linear order, without there being any hierarchical difference between them. There is, however, substantial evidence, which I will now review, that their assumption is incorrect.

Let us begin by assuming something like Baker’s (1988) UTAH principle, along with a strong interpretation of Chomsky (2001) on uniformity. Then English VO vs. Japanese OV cannot be attributed to a difference in how external merge works in the two languages. That is, assuming there to be no interpretive difference, it could not, for example, be the case that Japanese externally merges O as a specifier of V while English merges O as a complement of V. Therefore, if antisymmetry is correct, the

difference between Japanese OV and English VO must necessarily be associated with some difference in movement (internal merge) in the corresponding derivations.

A particularly strong related position, but one that is not central to what follows and that I will not pursue further here, would be as follows:

(1) All word order differences and all morpheme order differences are invariably to be attributed to movement differences.

3. Antisymmetry and OV

As already mentioned, antisymmetry has the following consequence, which is incompatible with the position that CGO take on Japanese:

(2) OV can never be associated with a structure in which O is sitting in the complement position of V.

It seems completely clear and undeniable that there exist languages or subparts of languages in which OV-order is produced instead by movement (to some Spec position above V). It is hard to see how anybody could disagree with that, if it is stated as an existential. One easy example in English is:

(3) They're having their car washed.

in which object *their car* comes to precede via movement (of the sort found in passives) the verb *wash* that it is the object of.

More telling are examples of OXV order involving movement of O where OXV order is 'canonical' or 'neutral' in the language in question, i.e. does not involve what one might think of as 'special' movements like the one found in (3). One such case is found in languages of a sort studied by Dryer (1992), with SONegV as a possible canonical order (as in Korean). As argued by Whitman (2005), on the assumption that Neg is merged outside VP, and therefore above O, the pre-Neg position of O in SONegV sentences must have been produced by movement. In a SONegV sentence, O can clearly not be occupying the complement position of the pronounced V.

Whitman argues more specifically that SONegV is produced by remnant VP-movement. The verb moves out of the VP by head movement; subsequently the entire (verbless) VP containing O moves past Neg, much as in Nkemnji's (1992; 1995) analysis of one word order pattern in Nweh.

An alternative to remnant VP-movement for SOXV is to have O move past X by itself. Kandybowicz and Baker (2003) argue specifically that both options are made available by the language faculty. While remnant VP-movement is appropriate for Nweh and for Lokaa, movement of O by itself is called for in Nupe. (This difference correlates with the fact that Nweh and Lokaa have S-PP-X-V, whereas Nupe does not.)

The SOAuxV order found in Lokaa is, again, an entirely clear instance in which O cannot possibly be in the complement position of the pronounced V. Such sentences are also found in (Dutch and) German in some cases, in particular in (embedded cases of) so-called IPP sentences (cf. Zwart 2007), in which the verbal complement of the auxiliary appears as an infinitive rather than as a past participle:

(4) Ich glaube dass er das Buch hätte lesen wollen. ('I believe that he the book would-have to-read to-want' = 'I believe that he would have wanted to read the book')

In this kind of embedded sentence (strictly speaking SOAuxVV, with two Vs) in standard German, the object must precede the auxiliary:

(5) *Ich glaube dass er hätte das Buch lesen wollen.

In other words, (4) is another example of a canonical/neutral word order (this time in German) in which O (*das Buch*) and V (*lesen*) do not even form a constituent in their canonical order. The conclusion that canonical OV order can involve movement of O seems inescapable.

We can also note the case of Malayalam, in which objects must surface in a position preceding that of VP-external focus (i.e. SOFocV), as emphasized by Jayaseelan (2001). Other instances of canonical separation of O and V are again found in continental West Germanic languages (if we abstract away from V-2 contexts). In West Flemish, for example, objects precede one of the negation markers (see Haegeman (2001; 2002)), as above for Korean. In Dutch and German, that type of (clitic) negation is not present, but the infinitive marker must still intervene between object and verb (i.e. O *te/zu* infin) and so must what are called separable particles, in the order 'O Prt *te/zu* V_{infin}', for example, in German:

(6) ...das Buch mitzubringen. ('...the book with to bring' = 'to bring along the book')

It should be noted that in instances of SOXV in which the O is carried to the left of X by remnant movement, it might perhaps still be the case that the pronounced O is in the complement position of the trace/copy of V. This would nonetheless be compatible with (2) as long as O, if in complement position, does not precede the trace/copy of V. On the other hand, it is by no means clear that O is allowed to remain in its merge position, insofar as it might always have to move for Case and/or EPP-like reasons. (This point is strongest if, as in Kayne (1998) and Chomsky (2001), movement cannot take place at LF.) In this vein, thinking at the same time of the VP-/predicate-internal subject hypothesis that is now widely held, of Kayne (2004) on prepositions as probes, and of Chomsky (2008) on the perhaps general raising of objects to Spec,V, one might well reach the following conclusion:

(7) All arguments must move at least once.

(Cf. Diesing (1992) on definite objects.)

Relevant here is Eastern Armenian as set forth by Tamrazian (1994), my interpretation of which is that, in Eastern Armenian, focalized phrases, wh-phrases, some adverbs and also indefinite objects obligatorily move to the specifier position of the auxiliary (or perhaps higher). (If a given sentence contains an overt auxiliary but no focus/wh/adv/indefinite, then it is the VP that moves to Spec,aux.) Eastern Armenian makes one wonder if Diesing (1992) was exactly right (it might be possible to maintain Diesing's primary intuition by saying that indefinites must end up in a position lower than the position in which definites end up, with both types then obligatorily moving up).

This conclusion reached in (7) would mean that even Japanese OV must invariably involve movement of O (as opposed to Japanese having O sometimes in situ in a Spec position above V, which would be compatible with antisymmetry, but not compatible with antisymmetry + (7); on O being in a Spec position, v. Larson (1988; 1990) and Collins (1993; 1997)).

A separate question is whether (7) should be taken to apply to NP objects within compounds. That it should, forcing movement to some Spec position, is suggested by the relative acceptability of:

(8) All this candy-giving to little children (of yours) has got to stop.
as well as by the possibility of an intervening particle such as *down*:

(9) an avid music downloader

(10) that music downloading student over there

In somewhat the same vein as (8), there are 'OVX' languages (where O is a single object and where X corresponds to another constituent or to other constituents within VP) like Bambara and Kpelle, as discussed by Koopman (1992) and Travis (1989). And as is often the case, a general characteristic of one language may be found to hold for 'part' of another. Thus Irish infinitivals (cf. McCloskey and Sells (1988)) look a bit like 'OVX', as does Gwari (cf. Hyman and Magaji (1970, 92)) in at least some sentences with auxiliaries.

Crucially (v. Dryer (1991)), there seem to be no 'XVO' languages such that O is a single object and X everything else within VP. From the present perspective, OVX reflects leftward preposing of the object alone to a particular Spec. A rightward counterpart that would allow XVO via rightward postposing of the object is excluded in principle, by antisymmetry.

4. Antisymmetry and cross-linguistic gaps

In the study of syntax, it is essential to see what is not there. For example, nobody has ever found two languages that are mirror images of one another, i.e. nobody has ever found two languages such that for any sentence in one, the corresponding sentence in the other would be its mirror image (taken either word-by-word or morpheme-by-morpheme). This is expected, given antisymmetry.

A more specific instance of a cross-linguistic gap of the type I have in mind can be seen by considering dislocations and hanging topics. Cinque (1977) has shown that Italian has two distinct types of left-dislocation, one of which he calls 'hanging topics'. Hanging topics occur at the left-hand edge of the sentence. As far as I know, there has never been a claim to the effect that there exists something exactly comparable on the right-hand edge of the sentence, in any language. The core reason for the absence of right-hand hanging topics, from the perspective of antisymmetry, is the prohibition against right-hand specifiers. In a symmetric linguistic universe, i.e. without antisymmetry, the absence of right-hand hanging topics would be mysterious.

The other type of left dislocation that Italian has, namely CLLD (clitic left-dislocation, as discussed in more detail in Cinque (1990)) does seem to have a right-hand counterpart, usually called (clitic) right-dislocation. Yet the pairing of CLLD and clitic right-dislocation (CLRD) is itself misleading. As argued by Cechetto (1999) for Italian and by Villalba (1999) for Catalan, there are sharp asymmetries within each of those two languages between CLLD and CLRD, which would be quite surprising if the linguistic universe were not antisymmetric. (Again, the core reason for this asymmetry is the antisymmetric prohibition against right-hand specifiers, which forces a remnant movement analysis and/or a bi-clausal analysis of CLRD (cf. Kayne (1994, sect. 7.3)), but not of CLLD (cf. Ott (2014), at least not in the same way.)

Related to this asymmetry between CLLD and CLRD is the fact that there are SVO languages (such as Haitian Creole and Gungbe) that lack CLRD entirely, but apparently no SVO languages that lack left dislocation entirely.

5. Antisymmetry and agreement.

The correctness of Greenberg's (1966) Universal 33, given here, would be surprising if syntax were symmetric:

(11) When verbal number agreement is suspended in an order-sensitive way, it's always when the verb precedes the NP.

This Universal 33 of Greenberg's concerns number only and claims that number agreement in '...NP...V...' contexts is more widespread than in '...V...NP...' contexts.

A controversial generalization of this would be:

(12) Verbal number agreement always requires that the NP (or DP) in question precede the verb at some stage of the derivation.

This position has in fact been taken (even more broadly) by Koopman (2003; 2005a), who argues that Chomsky (2001) was wrong to allow for purely 'downward' agreement.

A particular proposal for the apparent counterexample to (12) constituted by:

(13) There are books on the table.

is given in Kayne (2008) in terms of the idea that *there* in such sentences is a remnant that includes (a copy of and) the number features of *books*. This proposal might carry over to Italian sentences like:

(14) *Ne sono arrivati tre.* ('of-them are arrived three' = 'three of them have arrived') if such sentences in Italian contain a silent preverbal (clitic) counterpart of *there*. On the other hand, Italian transitive sentences in which a verb seems to agree with a post-V (focussed) subject:

(15) *Lo hanno mangiato i gatti.* ('it have eaten the cats' = 'the cats have eaten it') will probably require having 'lo hanno mangiato' move leftward past 'i gatti'. Whether one or another of these proposals will carry over to the partially comparable Icelandic examples often discussed in the literature remains an open question.

Both (11) and (12), which would be compatible with Agree necessarily being accompanied by movement, fit well with the facts of Italian past participle agreement. A basic contrast is:

(16) *Li ho visti.* ('them I-have seen(m.pl.)')

(17) **Ho visti loro.* ('I-have seen(m.pl.) them')

The past participle *visti* agrees with preceding clitic *li* but not with following non-clitic *loro*. It should be noted in passing that (12) is a necessary, but not sufficient, condition for past participle agreement to hold. This is shown by the fact that wh-movement does not in general license past participle agreement in Italian (cf. Déprez 1998):

(18) **Quali libri hai letti?* ('which books have-you read(m.pl.)')

6. Antisymmetry and relative clauses.

In a symmetric syntactic universe, one would have expected pre-nominal and post-nominal relatives to be similar, merely differing in their order with respect to the 'head' of the relative. However, Downing (1978) and Keenan (1985) noted substantial differences. These can be stated as follows (setting aside correlatives, and keeping to relatives that are in their canonical position for the language in question):

(19) Prenominal relatives (as opposed to postnominal relatives) generally lack complementizers akin to English *that*.

(20) Prenominal relatives (as opposed to postnominal relatives) usually lack relative pronouns.

(These two properties of canonically prenominal relatives are just one, if Kayne (2010a) is correct in taking English *that* and similar elements to be relative pronouns.)

(21) Prenominal relatives (as opposed to postnominal relatives) tend to be non-finite.

These differences fed into the specific proposal in Kayne (1994) that prenominal relatives always originate postnominally. A piece of evidence in favor of that view comes from Kornfilt (2000), who observes that the Turkic languages Sakha and Uigur have prenominal relatives whose subjects trigger agreement such that the agreement morpheme actually appears following the 'head' noun. She makes the plausible proposal that this agreement is produced via leftward movement of an originally postnominal relative containing a high Agr element. Put another way, what preposes past the 'head' NP in these languages is a not quite full relative clause; in particular the preposing to prenominal position strands the high Agr element, which remains postnominal.

In an asymmetric syntactic universe, the following should turn out to be correct (as seems to be the case):

(22) No postnominal relatives ever have their subject determining agreement that precedes the 'head' noun.

In other words, there can be no mirror-image of the configuration that Kornfilt discusses for Sakha and Uigur, the reason being that the leftward (partial) relative clause movement that plays a role in Sakha and Uigur can have no rightward counterpart, given antisymmetry.

7. Antisymmetry and serial verbs.

According to Carstens (2002), serial verb constructions differ cross-linguistically with respect to the relative position of verb and argument, but are cross-linguistically constant with respect to the relative order of the verbs themselves with respect to one another. Put another way, the higher verb of a serial verb construction consistently precedes the lower one, contrary to what we are accustomed to seeing with other cases of higher and lower verbs. The usual case cross-linguistically seems to be that various verb orders are possible. For example, English and German differ (in embedded non-V-2 contexts) in that English has auxiliary-participle order where German has participle-auxiliary order:

(23) We believe that John has telephoned.

(24) Wir glauben dass Hans telefoniert hat.

with the participle in German moving leftward past the auxiliary.

That serial verb sentences are cross-linguistically uniform in verb order must mean that for some reason (to be elucidated) the lower verb in such sentences is not able to undergo movement of the sort available in German in (24), or any other comparable movement. The fact that it is the lower verb that invariably follows the higher one in serial verb sentences will then directly reflect the antisymmetric fact that the complement of the higher verb must follow that higher verb. In effect, serial verbs, because they disallow verb-movement of a certain sort, provide a transparent window on the relation between word order and hierarchical structure.

8. Antisymmetry and coordination.

A similarly transparent window seems to be provided by a certain type of coordination, as Zwart (2009) shows. According to Zwart, if one looks cross-linguistically at NP/DP-coordination counterparts of English *and*, and if one limits oneself to coordinations in which *and* appears only once, one finds that *and* and its counterparts invariably occur between the two conjuncts:

- (25) a. NP and NP
- b. *and NP NP
- c. *NP NP and

Zwart draws the reasonable conclusion that the limitation to one possible order in (25) must be reflecting absence of movement. In antisymmetric terms, (25a) is telling us that *and* is a head, that the two conjuncts are specifier and complement of *and*, and that the order is as it is in (25a) because S-H-C order is the only order made available by the language faculty.

Coordination is relevant to questions of antisymmetry vs. symmetry in another way. Consider the following:

- (26) They went to the store and bought food.
- (27) They bought food and went to the store.

The first of these has a natural interpretation that is temporally asymmetric, with the going to the store preceding the buying of food. That natural interpretation is absent from the second example, in a way that would be surprising if the linguistic universe were symmetric.

9. Antisymmetry and forward vs. backward pronominalization.

These old terms pick out configurations that are configurations of non-c-command:

- 28) The fact that John is here means that he's well again.
- 29) The fact that he's here means that John is well again.

Both (28) and (29) have the property that in them neither *John* nor *he* c-commands the other. Put another way, from a c-command perspective on pronoun and antecedent, (28) and (29) do not differ. They do, of course, differ in precedence.

English gives the impression that in such non-c-command configurations anything goes, since both (28) and (29) are possible in English. This impression fed into Lasnik's (1976) claim that pronouns could freely take antecedents subject only to conditions B and C of the binding theory. Under that view of Lasnik's, the precedence distinction that holds in pairs like (28) and (29) should be irrelevant.

But English is not representative. Michel DeGraff (p.c.) tells me that in Haitian Creole 'backward pronominalization' of the sort seen in (29) is systematically impossible. Huang (1982) said that Chinese has much less backward pronominalization than English. Craig (1977, 150) in her grammar of Jacaltec says that Jacaltec has no backward pronominalization at all. Allan et al.'s (1995, 473) grammar of Danish says that Danish has either none or at least much less backward pronominalization than English (cf. Thráinsson et al. (2004, 331) on Faroese). Jayaseelan (1991, 76) says for Malayalam that for some speakers of Malayalam there is no backward pronominalization.

In other words, various languages completely or partially prohibit backward (as opposed to forward) pronominalization, in contrast to English (in a way that might be related to an absence of Heavy-NP-Shift (cf. Kayne (2002; 2003))). I don't know of any languages, though, that completely or partially prohibit forward (as opposed to backward) pronominalization in a parallel fashion.

There thus seems to be an asymmetry concerning antecedent-pronoun relations in contexts of non-c-command, of a sort that would be unexpected in a symmetric syntactic universe. This cross-linguistic asymmetry has to do with precedence. To the extent that the backward vs. forward pronominalization question is one of (narrow)

syntax, precedence must be part of (narrow) syntax, in a sense to be made more precise below.

I note in passing that the facts of (26) and (27) might be linkable to constraints on backward pronominalization if (26) necessarily contains a silent THEN taking as antecedent the tense of the first conjunct, as in:

(30) they went to the store and THEN bought food

Similarly for Greenberg's Universal 14, which reads as follows:

(31) In conditional statements, the conditional clause precedes the conclusion as the normal order in all languages.

This might be linkable to (in this case, weaker) constraints against backward pronominalization if a sentence like:

(32) If they stay, we're leaving.

necessarily contains a silent THEN, as in:

(33) if they stay, THEN we're leaving

10. Antisymmetry and intervening adverbs

AuxV languages often allows intervening adverbs between Aux and V, as in English *John has recently seen Mary*, whereas VAux languages generally do not. In part similarly, there are VO languages (such as English) in which V and O cannot be separated by adverbs. (In English, when there is only one non-prepositional object, V and O can be separated by a particle - even that is not possible in Danish (also VO).) What seems to be unattested is an OV language that systematically forbids its adverbs from intervening between O and V (at least when O is definite). In a symmetric syntactic universe, these asymmetries would be unexpected.

Something similar is suggested by the Amharic counterpart of *if*. According to Appleyard (1995, 183-199), Amharic necessarily has, for *if John likes linguistics*, the equivalent of 'John linguistics if likes', with 'if' immediately preverbal and in turn preceded by all the other components of the clause. In Kayne (2000a), I suggested an analysis whereby Amharic, 'starting from' a structure that resembles the actually occurring English one, preposes all the (non-clitic) arguments leftward past *if* (and similarly with other conjunctions). But there seem to be no mirror-image languages to Amharic in this respect, i.e. no language seems to have the equivalent of 'likes if linguistics John' (or 'likes if John linguistics'), with 'if' immediately postverbal and everything else necessarily following 'if'. Again, the leftward movement(s) used in this case by Amharic can have no rightward counterpart.

11. A more derivational antisymmetry

Taking all of the preceding discussion to have reinforced the correctness of antisymmetry, we can now ask specifically why it is that the faculty of language FL has the property of being antisymmetric. Kayne (1994) took the absence of directionality parameters to be axiomatic, via the LCA. No attempt was made there to ask or answer the question, why should FL contain anything like the LCA?

Moreover, the LCA, while sufficient (in conjunction with a certain definition of c-command) to exclude the orders S-C-H, C-S-H, H-S-C and H-C-S, could not by itself tell us why FL has as its unique order S-H-C, rather than the mirror image order C-H-S. An attempt was made in chapter 5 using time slots and an abstract node A, but was not

entirely satisfactory, in particular because it did not tightly tie the S-H-C vs. C-H-S question to other aspects of syntax.

I would like now to try to provide a deeper account of antisymmetry in general and of the S-H-C vs. C-H-S question in particular. This newer account will transpose the LCA-based ideas into the more derivational framework of Chomsky (1995) and later work. As far as I can see, this will require transposing into a derivational framework the LCA idea that precedence is an integral part of syntax, in a way that is not compatible with CGO's idea that linear order is not part of syntax proper.

12. Precedence is part of syntax

The structure of the argument will be to first show that FL has H-C order and not C-H order. The second step will be to show that S (specifier) must be on the opposite side of H from C. From those two conclusions, S-H-C and antisymmetry will follow.

I adopt an alternative to standard Merge that is mentioned but not pursued in Chomsky (2008), namely that Merge should always be taken to form the ordered pair $\langle X, Y \rangle$, rather than the set $\{X, Y\}$. As Chomsky noted, part of the issue is whether linear order/precedence plays a role in the mapping to C-I; in this regard the earlier discussion concerning backward vs. forward pronominalization increases the plausibility that precedence does play a role in that mapping and is not entirely confined to the PF side.

If Merge creates ordered pairs, then in the case of the merger of a head and its complement (i.e. of a head and the first phrase it is merged with), there is a priori the choice between $\langle H, C \rangle$ and $\langle C, H \rangle$, with $\langle H, C \rangle$ corresponding to 'head precedes complement' and $\langle C, H \rangle$ corresponding to 'complement precedes head'.

13. Probes precede goals

Let me focus initially on cases where H potentially acts as a probe relative to some goal contained within C. The question is how the probe-goal relation interacts with precedence, if precedence is part of narrow syntax. Assuming precedence is part of syntax, a reasonable view is that a probe, in searching a domain, must search either from left-to-right (if the probe is initial, as in H-C) or from right-to-left (if the probe is final, as in C-H). Put another way, the search starts with the probe and then moves on in a direction determined by H-C vs. C-H until it reaches the goal. If H-C, the search starts at the beginning, in precedence terms. If C-H, then the search starts at the end.

The picture of search presented so far has been left-right symmetric. To distinguish H-C from C-H we need to induce an asymmetry, by adopting:

(34) Probe-goal search shares the directionality of parsing and of production. Both parsing and production show a beginning vs. end asymmetry. The hearer hears the beginning of the sentence first and the end last. The speaker produces the beginning of the sentence first and the end last. Using the terms left and right in a familiar way, this amounts to observing that both parsing and production proceed from left to right. Given (34), we therefore reach:

(35) Probe-goal search proceeds from left to right. despite the fact that probe-goal search is not literally temporal in the way that parsing and production are. In effect, if (34) and (35) are correct, FL has incorporated an abstract counterpart of temporality.

This addresses a point raised by Chomsky (1995, 221), who says "If humans could communicate by telepathy, there would be no need for a phonological component, at

least for the purposes of communication; and the same extends to the use of language generally. These requirements might turn out to be critical factors in determining the inner nature of C_{HL} in some deep sense, or they might turn out to be “extraneous” to it, inducing departures from “perfection” that are satisfied in an optimal way.” If (34) and (35) are correct, then aspects of the phonological component have indeed determined “the inner nature of C_{HL} in some deep sense”.

Given that the probe is the head and that the goal is contained within the complement, (35) is equivalent to:

(36) Head and complement are invariably merged as $\langle H, C \rangle$.

That is, the head invariably precedes the complement.

We have thus concluded the first stage of the argument leading to S-H-C, namely that FL countenances only H-C (and never C-H). The argument has rested on the incorporation of precedence (back) into derivational syntax, and specifically on the proposal in (34) that syntactic computation mimics the left-right asymmetry of parsing/production.

14. Specifiers precede probes/heads

Let us focus on internal merge and for the purposes of this section on the subcase in which one phrase is internally merged to another (as opposed to head movement):

(37) $[C \dots S \dots]$

Here, a phrase S (about to become a specifier of H) is contained in a larger phrase C. A lexical item H (perhaps always a functional head) is merged:

(38) $H [C \dots S \dots]$

S moves from within its complement C to become the specifier of H:

(39) $S H [C \dots S \dots]$

This movement involves some property or properties of H.

It might still at first glance and once clearly did seem reasonable to think of H as having an additional property of the following sort:

(40) Spell out the specifier S of H to the left/right of the phrase headed by H that S is merging with.

The parametric option ‘left’ in (40) would match (39); the option ‘right’ would match:

(41) $H [C \dots S \dots] S$

(By the result of the preceding section, H must consistently be to the left of C, as indicated.)

If antisymmetry is correct, FL does not provide such a choice. Only (39) is possible. The seemingly plausible option (41) is never possible. Put another way, if antisymmetry is correct, then (40) is not part of the stock of FL parameters. Why, though, would FL have turned its back on the apparently straightforward (40)?

We need to keep in mind here both specifiers arising from internal merge and specifiers arising from external merge. For internal merge, Abels and Neeleman (2006) have suggested taking what was a ‘theorem’ in Kayne (1994), to the effect that movement is always leftward, and elevating it to an ‘axiom’. Indeed, if movement is always leftward then any internally merged specifier will, given the extension condition, necessarily precede H-C, yielding S-H-C order. As part of their critique of Cinque (2005), which has a strong argument in favor of an antisymmetric account of Greenberg’s Universal 20, Abels and Neeleman very specifically want to limit to internal

merge the necessity for specifiers to be on the left, and propose allowing externally merged specifiers to be to the right (or to the left).

Since I feel that they have not made their case against Cinque, since I do not want to weaken antisymmetry to allow both left- and right-hand specifiers (even if limited to external merge) and since I would like not to take leftward movement as an axiom, but rather would like to derive the leftness of all specifiers from more general considerations, I will explore a different avenue, one that is more derivational than the one followed in Kayne (1994), with the two having in common the use of an intermediate step in the derivation of S-H-C, to the effect that specifier and complement must be on opposite sides of the head.

I would like to establish a link between the exclusion of (40) from FL and the existence of a certain lack of homogeneity in our conception of Merge. In bare phrase structure, one speaks of first merge and second merge in lieu of complement and specifier. Neither terminology does justice to the fact that, while first merge involves merger of a phrase with a head, second merge involves merger of a phrase with another phrase.

15. Unfamiliar derivations

The idea that I would like to pursue is that it is at bottom the very fact that S in (39) is taken to merge with <H, C> (rather than with H) that (incorrectly) gave the directionality parameter (40) its initial plausibility. Consequently, we can divest (40) of what plausibility it seemed to have, and thereby account for FL not countenancing it, if we are willing to take S in (39) to merge, not with <H, C>, but rather with H itself.

Taking S in (39) to merge with H itself would sharpen the sense in which heads are central to syntax, going back to Chomsky (1970). Every instance of Merge must directly involve a head, in the sense that (at least) one of the two syntactic objects merged must be a head. Merge never directly constructs a set consisting of two syntactic objects each of which is a phrase. From this perspective, (40) is not storable insofar as S(specifier) is not actually merging with any phrase at all.

A way of executing this idea is as follows, with the key question remaining, why exactly is the directionality parameter (40) not countenanced by FL? Generalized pair-Merge is part of the answer, I think, but not the whole answer, since (40) could seemingly be recast in terms of ordered pairs:

(42) Merge produces either <S,{H,C}> or <{H,C},S>.
in conflict with antisymmetry.

What property of FL might make (42) (and (40)) unavailable? As I suggested earlier (cf. Kayne (2011), from which part of this talk is taken):

(43) The merger of two phrases is unavailable.
In which case, with S a phrase, neither (42) nor (40) is formulable. What this amounts to, in the case, say, of (39), repeated here:

(44) S H [c...S...]
is the claim that when S is internally merged in (44), S is merged with the head H, rather than with the phrase <H,C>. The consequence is that, in such a derivation, H itself will have been merged both with C and (then) with S.

Taking Merge to always be pair-Merge interpreted as temporal precedence, and further taking Merge to necessarily involve (at least) one head, as required by (43), leads to recasting (44) as (setting aside derivational steps leading to C):

(45) <S,H>, <H,C>
corresponding to the precedence relations given in:

(46) S H C
but without 'S H C' forming a standard constituent.

Let me note that (45) is less symmetrical than it looks. That is so, since displayed as it is (45) fails to show the derivational steps leading to it. Derivationally speaking, S and C remain sharply distinct. C, as the phrase merged first with H, is probed by H. S is the second phrase merged with H and is not probed by H.

4.7 Immediate precedence

Precedence in (45)/(46) can and should be understood as immediate precedence (henceforth i-precede(nce)). Thus <S,H> means that S i-precedes H and <H,C> means that H i-precedes C, with the transition from (45) to (46) now clearer. Let me use the term ip-merge as shorthand for 'pair-merge with i-precedence', i.e. for 'immediate precedence merge'.

I-precedence is of importance in that it leads to:

(47) H can be ip-merged with at most two elements.

This holds since the (temporal) i-precedence we are interested in in syntax is an ordering that has the property that if X i-precedes Z and Y i-precedes Z then X = Y. Similarly, if Z i-precedes X and Z i-precedes Y, then X = Y.

Given (47), i-precedence yields the property that if H is separately ip-merged with each of two elements X and Y (as in (45)), then X cannot i-precede Y, nor can Y i-precede X. A syntactically more perspicuous rendering is:

(48) If H ip-merges with X and also ip-merges with Y, then X and Y must be on opposite sides of H.

From (47) follows in a natural way the restriction barring multiple specifiers argued for in AS. In effect, (45)/(46) corresponds to an ordinary instance of specifier-head-complement. By (47), nothing further can be ip-merged with H. And by (43), there is no option of phrase-phrase merger. Put another way, Chomsky's (2008) point that "Without further stipulation, the number of specifiers is unlimited" does not hold, given (43), if i-precedence is associated with pair-merge.

From (48) it follows, more centrally to antisymmetry, that specifier and complement must invariably be on opposite sides of the head. If we now combine this conclusion that specifier and complement must invariably be on opposite sides of the head with our earlier conclusion (based on (34)/(35)) that FL consistently imposes H-C order, we reach the desired result:

(49) FL consistently imposes S-H-C order.

If H-C order holds uniformly, i.e. independently of any internal vs. external merge distinction (cf. Kayne (2011, sect. 4.4)), (49) must, given (48), also hold uniformly, whether S is internally merged or externally merged.

16. Partial vs. total order

CGO argue for completely factoring linear order out of core syntax in part on the basis of the fact that no syntactic operation uses a notion of 'closest', where closest is defined in terms of linear order. Thus starting from:

(50) The person who is over there is famous
subject-aux inversion yields:

(51) Is the person who is over there famous?
and not:

(52) *Is the person who over there is famous?
in which the linearly closest aux to the complementizer position would have been moved.

CGO's argument is sound up to a point. But it doesn't go as far as they suggest, if classical merge is replaced by ip-merge as above. Consider the following simplified case. A head H is ip-merged with a complement C yielding the phrase 'H C' with that linear order. Separately a phrase 'Y Z' is formed in the same way, and then 'Y Z' is merged with a Spec X yielding:

(53) X [Y Z]

Subsequently, 'X [Y Z]' is ip-merged with 'H C' (i.e. as the Spec S of 'H C'), yielding:

(54) [_S X [Y Z]] H C

The key point now is that what this ip-merge based derivation says so far (setting aside ordering that is entirely internal to S) is only that H i-precedes C and that S i-precedes H. Y definitely does not have the property of i-preceding H. Consequently, if we add a higher head H*, as in:

(55) H* [_S X [Y Z]] H C

no syntactic operation would be expected to see Y as being closer to H* than H is. In effect, the system as developed so far establishes no order relation at all between Y and H.

Since the first aux in (50) corresponds (abstracting away from irrelevant extra structure) to Y in (55) and the second aux in (50) corresponds to H in (55), it follows that subject-aux inversion could not possibly use linear order to choose the first *is* in (50), as desired.

Of course, the first *is* in (50) does precede the second one, even if it does not i-precede it. In effect, CGO's argument shows that precedence in the broader sense cannot be seen by syntactic operations, but it does not show that i-precedence itself should be shunted to PF. Put another way, we can take precedence in the broad sense to be part of externalization, in agreement with CGO, while at the same time taking i-precedence and ip-merge to be integral parts of core syntax. In a way reminiscent of Kayne (1994, 5), this amounts to saying that we have the following as part of externalization:

(56) If X i-precedes Y, then all the terminals dominated by X precede all the terminals dominated by Y.

At the same time, ip-merge, using i-precedence, is not part of externalization, but rather a central aspect of syntax proper.

17. The absence of mirror-image operations

CGO take the absence of mirror-image operations to indicate that linear order cannot be part of core syntax. But the ip-merge approach to syntax sketched above does not make it possible to state a mirror-image operation in the core syntax, if only because in the general case the ordering of terminals comes about only via (56), as part of externalization.

Nor is it plausible to think that there could be a limiting case of a mirror-image operation, of the sort that would say 'invert the order of H and C'. It may be that the prohibition against this kind of inversion is akin to the obvious prohibition against having

two phrases switch places with each other. For example, in (55), even if taken to be solely a hierarchical representation, it is impossible to imagine a syntactic operation that would have C and Z switch places.

Another relevant point is that mirror-image operations are absent, as far as I know, even at PF, where linear order must hold. Phonology has metathesis (cf. Chomsky and Halle 1968, 361, 392) and other operations that are syntax-like to one degree or another (cf. Nevins 2010 on vowel harmony), yet there is almost certainly no case of a language taking the phonological mirror-image of some morpheme or word or phrase to express, say, focus.

18. Why did the language faculty choose to have i-precedence be part of syntax?

One possibility is that there is only one ip-merge engine that includes the phonology. Since phonology must be associated with linear order, it could be that syntax must be, too, insofar as it and phonology share the same ip-merge operation. (On the idea that (ip-)merge itself manipulates phonological segments, v. Kayne (2016).) A second consideration, compatible with the first, has to do with the possible relation between language and music, going back to Lerdahl and Jackendoff (1983). If music is language-like in important ways, and if it is true that factoring out linear order (temporal ordering in Schlenker 2017) from hierarchical structure in music has little plausibility, then it may have less plausibility for language than it does in CGO. It might then be that i-precedence is more central to more aspects of human cognition than has been thought.

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