

Antisymmetry and Externalization

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1. Word Order.

Chomsky (2020) has emphasized that one hears linear order, but not structure. Yet, despite this fact, the head parameter approach to word order variation has over the years taken it for granted that English-type VO sentences and Japanese-type OV sentences are straightforwardly showing us sisterhood relations (despite our not hearing them), with VO and OV both corresponding in this view to derivation-final head-complement configurations.

At the same time, everyone agrees with Pollock (1989) and others that French VO sentences, in particular those with a finite verb, involve V-raising. In which case, French VO does not correspond to a derivation-final sister relation. With this in mind, and thinking also of Pearson (2000), let me make the following more general proposal:

- (1) Neither VO nor OV ever reflects a derivation-final sister relation.

Whether verbs raise to one degree or another in all languages remains to be determined. (Johnson (1991) has argued that they do even in English.) But the following conjecture related to (1) seems to me likely to turn out to be valid:¹

- (2) Arguments invariably raise at least once, in all languages.²

¹Cf. Kayne (2011). This conjecture may be related to the Decompositionality principle of Kayne (2005a, Appendix).

²I'm taking noun-incorporation, following Baker (1988), to involve movement. If the nominal subpart of English deverbal compounds counts as an argument, then it must have moved, too, as in Kayne (2011, sect. 2), with that movement possibly being to a low specifier position (and similarly for Baker's NI).

Diesing (1992), Mahajan (1992) and Postma (1994) must now be interpreted as showing only that indefinites necessarily end up lower than definites, perhaps in a way

A further, more general conjecture is the following (which rests in part on Baker's (1988, 46) UTAH principle):

(3) All word order differences are traceable back to movement differences.
a natural extension of which, as in Kayne (2019a), is:

(4) All morpheme order differences are traceable back to movement differences.

For example, with respect to (4), English reversive *un-*, as in *undo*, *unpack*, seems to have a suffixal counterpart in Bantu languages.³ From (4) it then follows that English and the relevant Bantu languages must differ either in V(P)-movement or in the movement of this (counterpart of) *un*, or in both.

That V and O are never sisters derivation-finally leads one to wonder if they are ever sisters derivation-initially, i.e. if they are ever merged with each other as head and complement. The small clause and ECM traditions say no for a certain class of apparent objects.⁴ Larson (1988) says no for cases like *They put the book on the table*, for which he takes *the book* to be externally merged into a Spec position. Whether or not his position should be generalized to all transitives needs to be determined.

2. More on OV.

Although Japanese-type OV incorrectly lends itself to the idea that O and V can be sisters derivation-finally, there are other languages in which O precedes V that show directly that derivation-final sisterhood is immediately implausible. These are languages with canonical/neutral OXV order.

One case of OXV comes from languages of the sort studied by Dryer (1992), with ONegV as a possible canonical order (as in Korean). As noted by Whitman (2005), on the standard assumption that Neg is outside VP, and therefore above O, the pre-Neg position of O in SONegV sentences must have been produced by movement of O to the Spec of some higher head. 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) in fact argue that both options are available. While remnant VP-movement is appropriate for Nweh and also for LokaꞤ, movement of O by itself is called for in Nupe. (This difference correlates, as they show, with the fact that Nweh and LokaꞤ have S-PP-X-V, whereas Nupe does not.)

The OAuxV order that LokaꞤ also allows is again a clear instance in which O cannot be in the complement position of V. Such sentences are also found in some cases in Dutch and German, in particular in (embedded instances of) so-called IPP sentences, as discussed by Zwart (2007) among others. An example from German would be:

related to focus being lower than topic, as in Jayaseelan (2001); cf. also Koster's (1994) distinction between movement of definites to Spec,AgrOP and movement of indefinites to Spec,PredP.

³Cf. Nurse and Philippson (2003, *passim*).

⁴Cf. Kayne (1981) on DOCs.

(5) 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 which the object *das Buch* precedes the auxiliary *hätte*.

There is in addition the case of Malayalam, in which objects must surface in a position preceding that of VP-external focus (i.e. Malayalam has OFocV), as emphasized by Jayaseelan (2001). Somewhat differently, returning to Dutch and German, we can note that in both those languages the infinitive marker must intervene between object and verb and so, too, must (abstracting away from V-2) what are called separable particles, with an example from German being:

(6) ...das Buch mitzubringen. ('...the book with to bring' = '...to bring along the book') The object here must precede the infinitival verb, but is clearly not in a sister position to it. (Cf. the fact that in West Flemish embedded sentences objects precede one of the negation markers, as discussed by Haegeman (2001; 2002).)

Relevant, too, is Eastern Armenian as in Tamrazian (1994), a plausible 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).⁵ (Cf. more specifically Giorgi and Haroutyunian's (2020, sect. 5) argument that indefinites must end up in the left periphery of vP, in a way partially akin to focus.)

In further support of the idea that O is derivation-finally never sister of V, we can note the existence of OVX languages, where O is a single object that moves up past V and where X corresponds to another constituent or to other constituents within VP; two instances of such languages are 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 Ulster Irish infinitivals, as studied by McCloskey and Sells (1988: 148), look like SOVX, as does Gwari (cf. Hyman and Magaji (1970: 92)) in at least some sentences with auxiliaries.

3. How not to study word order variation.

Greenberg (1966) has shown that studying word order variation pairwise is not sufficient. He found that if you look, for example, at the pair Dem and N, you find that both ordering possibilities (Dem N, as well as N Dem) are attested cross-linguistically. And the same holds for Numeral and N, with Num N order attested in some languages, and N Num order in others, as well as for Adj and N. In other words, looking at these three pairs separately gives the initial impression that the language faculty is highly flexible.

Yet, as Greenberg showed in his Universal 20, if you examine combinations of all four of these categories together, the picture changes dramatically. A strong asymmetry appears. If N is final, then the order of the other three is in fact fixed, and one has 'Dem Numeral Adj N' order. Whereas if N is initial the order of the other three is not fixed; for details and theoretical underpinning, see Cinque (2005; 2020b).

As Cinque shows in those papers, this asymmetry between prenominal order and postnominal order fits directly into the antisymmetry proposal that I made in Kayne

⁵If a given sentence contains an overt auxiliary but no focus/wh/adv/indefinite, then it is the VP that arguably moves to Spec,aux.

(1994), from the perspective of which such left-right (pre-N/post-N) asymmetries are expected.

As Cinque (2009) further shows, such complex left-right asymmetries are in fact more widely found than just in the case corresponding to Greenberg's Universal 20. As in Greenberg's case, these asymmetries come to the fore only if one examines the relative order of sets, not just pairs, of elements.

4. Antisymmetry.

In general, empirical arguments that support antisymmetry also rest on more than just observations concerning the relative order of simple pairs of elements. Often, they involve cross-linguistic gaps (in the study of syntax, it is essential to see and examine what is not there); on this empirical side, antisymmetry can be thought of as grouping together a substantial set of Greenbergian cross-linguistic generalizations and providing a single theoretical account for all of them.⁶

As an initial example, let me take Cinque's (1977) demonstration 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.)

The other type of left dislocation that Italian has, namely CLLD, as discussed in detail in Cinque (1990), does at first glance seem to have a right-hand counterpart, usually called (clitic) right-dislocation. Yet the pairing of CLLD and clitic right-dislocation (CLRD) is 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, a fact that would be quite surprising if the linguistic universe were not antisymmetric. (More specifically, the antisymmetric prohibition against right-hand specifiers forces a remnant movement analysis and/or a bi-clausal analysis of CLRD, as in Kayne (1994: sect. 7.3); but this does not hold for CLLD,⁷ at least not in the same way.)

Related to this asymmetry between CLLD and CLRD is, arguably, the fact that there are SVO languages (such as Haitian Creole and Gungbe) that seem to lack CLRD entirely, but apparently no SVO languages that lack left dislocation entirely.⁸

5. Antisymmetry and relative clauses.

In a symmetric syntactic universe, one would have expected prenominal and postnominal 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):

⁶For much relevant discussion, see Biberauer et al. (2014) and Sheehan et al. (2017).

⁷Cf. Ott (2014).

⁸Cf. Baker (2003: 111) on Kinande and Torrence (2005: 70, 73, 75) on Wolof. On a possible link to the position of D, cf. Kayne (2003: text to note 29).

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

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

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

These differences fed into the proposal in Kayne (1994) that prenominal relatives always originate postnominally.⁹ A striking piece of evidence in favor of such post-N origin 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 proposes that this agreement is produced via leftward movement of an originally postnominal relative containing a high Agr element that is stranded by that movement.

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

(10) No postnominal relatives ever have their subject determining agreement such that the agreement morpheme precedes the “head” noun. In other words, the ‘mirror image’ to Sakha and Uigur should not and seems not to exist.

6. Antisymmetry and coordination.

A somewhat similar window on the architecture of the language faculty is 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:

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

Zwart draws the reasonable conclusion that this limitation to one possible order must be reflecting absence of movement.¹⁰ In antisymmetric terms, this seems to be telling us that *and* is a head,¹¹ that the two conjuncts are specifier and complement of *and*, and that the order is as it is in (a) because S-H-C order is the only order made available by the language faculty.

Concerning (11b), Zwart is in agreement with Stassen (2000, 15).¹² However, Stassen (2000, 14) notes that (11c) does not hold in Latin, Pitjantjatjara and Tubu. At the same time, Stassen makes the plausible proposal that these apparent counterexamples to (11c) can be thought of as involving deletion of a second ‘and’, i.e. they would in fact be of the ‘NP and NP and’ type, and hence not true counterexamples to (11c).

⁹For an opposing view, see Cinque (2020a).

¹⁰If so, then the individual arguments of a coordination of arguments must not each count separately with respect to (2) above.

¹¹Cf. Larson (1990, 595), Kayne (1994, chapter 6) and Johannessen (1998, section 3.2).

¹²I am grateful to Guglielmo Cinque for bringing Stassen (2000) to my attention.

A second possible way in which such apparent counterexamples to (11c) might be dissolved would rest on the claim that in (some of) the relevant languages, the apparently coordinating element in question does not actually correspond to *and*. This has some plausibility for Latin *-que*, to judge by Gildersleeve and Lodge's (1895, 300) statement that Latin *et* "is simply *and*, the most common and general particle of connection" and that "*-que* (enclitic) unites things that belong closely to one another", which suggests that *-que* might be closer to English *as* (cf. *just as*, *as well as*) than it is to *and*; if so, Latin *-que* would not be relevant to (11c).

The head status of *and* is also suggested by the apparent fact that the 'and NP and NP' type of coordination (possible in French, e.g. *et Marie et Jean*) is only found in languages that would otherwise informally be thought of as 'head-initial'; and by the related fact that the 'NP and NP and' type is only to be found in 'head-final' languages.¹³ (Indirectly related to this is Johannessen's (1998, 270) discovery that "out of 12 OV languages, 11 have the deviant UC [Unbalanced Coordination] conjunct in the first position; out of 14 VO languages, all have the deviant UC conjunct in the second position".)

That coordination is not symmetric is supported in a number of different ways by Johannessen's (1998) general discussion of Unbalanced Coordination,¹⁴ as well as by the following contrast involving the bound reading of *his*:¹⁵

(12) ?Every little boy and his mother were at the party.

(13) *His mother and every little boy were at the party.

This contrast suggests that the first conjunct c-commands the second, but not vice versa.

In addition, we can note the following:

(14) They went to the store and bought food.

(15) They bought food and went to the store.

The first of these has a very natural interpretation that is temporally asymmetric, with the *going to the store* leading to the *buying of food*. That exact interpretation is absent from the second example, in a way that would be surprising if coordination were symmetric. (What may further be at issue here is the presence of a silent THEN in the second, c-commanded conjunct that is not allowed to appear in the first, c-commanding conjunct, in a way that recalls Condition C of the Binding Theory.)

7. Antisymmetry and adverbs.

As another example of the way in which antisymmetry 'shows through', let me briefly mention some adverb facts. AuxV languages often allows intervening adverbs between Aux and V, as in English *John has recently seen Mary*, whereas VAux languages

¹³Cf. Stassen (2000, 15): "If a language has a (monosyndetically or polysyndetically) postposed coordination marker, then that language is verb-final".

Note that English *I should invite Mary and John both*, though of interest, does not directly bear on this generalization, insofar as *both* is not an instance of 'and'.

¹⁴Cf. also first conjunct agreement in Arabic, as discussed by Aoun et al. (2010, sects. 4.3, 4.4).

¹⁵Cf. Wilder (1997, 64).

generally do not.¹⁶ In addition, there are VO languages (such as English) in which V and O cannot be separated by adverbs. What seems to be unattested, though, is an OV language that would systematically forbid its adverbs from intervening between O and V (in particular when O is definite). In a symmetric syntactic universe, these asymmetries concerning adverbs with respect to AuxV vs. VAux and with respect to VO vs. OV would be unexpected.

8. Antisymmetry and the antecedent-pronoun relation

English readily allows both of the following:¹⁷

(16) The fact that John is here means that he's well again.

(17) The fact that he's here means that John is well again.

Both (16) and (17) have the property that in them neither *John* nor *he* c-commands the other, with English thereby giving the impression that in such non-c-command configurations anything goes. 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.¹⁸

But English is not representative. Michel DeGraff (p.c.) has told me that in Haitian Creole "backward pronominalization" of the sort seen in (17) is systematically impossible. Huang (1998, sect. 5.5.2) indicates 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 about Malayalam that some speakers of Malayalam allow no backward pronominalization at all.

I don't know of any languages, though, that completely or partially prohibit forward pronominalization of the sort seen in (16) in a parallel fashion. There thus seems to be a precedence-based asymmetry concerning antecedent-pronoun relations in contexts of non-c-command, of a sort that would be unexpected in a symmetric syntactic universe.¹⁹

9. Externalization

In his recent work, Chomsky has suggested that linear order is not part of core syntax and that it comes into play only as the result of externalization. This differs from the position taken in Kayne (1994). We can now ask to what extent antisymmetry is compatible with Chomsky's view of externalization.

One very general way to think of antisymmetry is in terms of trees and mirror-images, with antisymmetry holding that for every given pair of mirror-image trees, at most one can be well-formed. But more specifically, antisymmetry claims that linear

¹⁶Cf. Sheehan (2017).

¹⁷For early discussion, see Langacker (1969).

¹⁸Cf. Berwick and Chomsky (2016, 118ff.)

¹⁹For a proposal on why backwards pronominalization is cross-linguistically more restricted, see Kayne (2002, section 13).

order is dependent on structure; in particular for every projection, the mapping to linear order must invariably yield Spec-Head-Complement order.

(Somewhat less centrally, antisymmetry requires that there be only one Spec per projection, in a way that feeds into cartography work, as exemplified by Rizzi (1997) and Cinque (1999).)

My impression is that in externalization terms one could, if one agrees that S-H-C is basically correct for any of the reasons given above, incorporate antisymmetry into the mapping from core syntax to PF.

The question remains, though, as to why antisymmetry holds (in 1994 terms, why the LCA is a valid axiom). In Kayne (2011; 2019a), I suggested that an answer to this question requires taking linear order to be part of core syntax, via a certain use of an alternative to standard Merge that was mentioned but not pursued in Chomsky (2008) (cf. Chomsky (2020) on Pair-Merge, though his use of it is different from mine, as is Saito and Fukui's (1998), which retains a head parameter orientation), namely that Merge should always be taken to form the ordered pair $\langle X, Y \rangle$, rather than the set $\{X, Y\}$.

Chomsky (2020) takes the opposite view, i.e. he takes the view that linear order is not at all part of core syntax, in part on the basis of the point that differences in linear order do not feed differences in semantic interpretation, which depends only on structure (and on lexical items and features).

But this point rests on the assumption, denied by antisymmetry, that linear order can vary independently of structure (as it could in the head parameter tradition). If, on the other hand, linear order is fully determined by hierarchical structure, then there is no reason to expect it to be able to make its own independent contribution to semantic interpretation. If so, then linear order can, as far as interpretation is concerned, still be part of core syntax.

Another (long-standing) reason why Chomsky has taken linear order not to be part of core syntax has to do with examples that show that internal merge cannot take the linearly closest auxiliary in English subject-aux inversion.²⁰ Thus starting from:

(18) Somebody who is in Paris is on the phone.
one cannot conceivably derive:

(19) *Is somebody who in Paris is on the phone?

The question arises, though, as to whether this strong prohibition might derive from independent structural factors, e.g. from the general impossibility of extraction from within a subject phrase, or from within a relative clause. Such extraction, however, does not always yield a violation as strong as that of (19); to my ear the following is less sharply deviant than (19):

(20) ???a man who close friends of like us a lot
especially with parasitic gaps:²¹

(21) ?a man who close friends of admire

One can, on the other hand, reach a violation as sharp as that in (19) if, instead of extracting an argument, as in (20) and (21), one tries to extract a non-argument such as an adverb. Thus, starting from:

²⁰Indirectly relevant here is the question whether Internal Merge is triggered; for Chomsky (2019, 268) it is not.

²¹For relevant discussion of parasitic gaps, cf. Kayne (1983).

(22) Somebody who was speaking loudly left very suddenly.
it is sharply impossible to derive:

(23) *How loudly did somebody who was speaking leave very suddenly?
and similarly even for parasitic gaps (where the notion of 'closest' is not obviously relevant). For example, starting from:

(24) Somebody who was behaving badly was near somebody else who was behaving badly.

one cannot reach:²²

(25) *How badly was somebody who was behaving near somebody else who was behaving?

Similarly, a parasitic gap counterpart of (19) remains strongly deviant:

(26) *Is somebody who in Paris on the phone?

If (19) is sharply deviant for the same reason as (23), (25) and (26), then (19) is compatible with taking linear order to be part of core syntax.

10. No counting.

Chomsky (2020) also mentions work by Moro et al. (2003) showing that Broca's area activation does not take place when subjects are presented with an 'unreal' language in which, for example, negation would be the third word in a sentence. This is obviously a telling point, but I don't think it bears directly on the question whether linear order is part of core syntax. Rather, what it shows, I think, is only that the language faculty doesn't count numerically. Clearly it doesn't count words in linear order.

But it also doesn't numerically count structural notions such as depth of embedding. As far as I know, no syntactic operation takes, or could possibly take, as its goal a phrase that would be exactly three nodes down from the (node immediately dominating the) probe. Nor could any syntactic operation search for a phrase that is the third closest, structurally speaking.²³

That numerical counting is not countenanced by the language faculty is itself something that needs to be understood (in particular against the background of Chomsky's proposal that arithmetic is an offshoot of the language faculty), but its unavailability does not imply that linear order is not part of core syntax.

11. Semantic interpretation and core syntax.

Returning to the question of semantic interpretation, where I have taken the position that even though linear order doesn't directly feed into it (since linear order is antisymmetrically determined by hierarchical structure) linear order is nonetheless part

²²The same holds of Chomsky's (2020) example:

i) Carefully the guy who fixed the car packed his tools.

The adverb *carefully* cannot originate within/be extracted from the relative clause embedded within the subject, whether there is in addition a parasitic gap or not.

²³On whether or not phonological operations can count numerically, see Paster (2019) and references cited there. On the question of the degree of similarity between phonology and syntax, see Kayne (2016, section 15).

of core syntax, let me take all this to be part of a broader question, namely whether or not semantic interpretation must take into account all aspects of core syntax.²⁴

This broader question ties into one raised by Chomsky et al. (2019), who state that “Whether...semantically vacuous scrambling, extraposition, clitic movement etc., ...reflect narrow-syntactic computations or are part of the mapping to PHON...is an open question”.

If (2), repeated here:

(27) Arguments invariably raise at least once.

is correct, then even arguments that appear in their canonical position in the language in question will have been moved there in what appears to be a semantically vacuous way (unless the semantics pays important attention to the link between even an argument in canonical position and its trace).

But what I’m really getting to is the fact that semantically vacuous syntactic operations can in principle also be diagnosed as being part of core syntax through their interactions with other syntactic operations. Take, for example, relative clause extraposition, which feels semantically neutral in pairs like:

(28) Somebody who I used to know in high school just walked in.

(29) Somebody just walked in who I used to know in high school.

Yet there is a restriction seen in:

(30) The only person who I liked in high school just walked in.

(31) *The only person just walked in who I liked in high school.

presumably due to a property of the scope of *only* that must be part of core syntax.

In a partially similar way, consider clitic movement, which in simple cases seems to have no semantic effect. Yet we have contrasts in French of the following sort:²⁵

(32) Combien (*en) ont lu ton livre? (‘how-many (of-them) have read your book’)

(33) Combien tu *(en) a lus? (‘how-many you (of-them) have read’)

When one fails to pronounce the noun that goes with *combien* (‘how many’), the clitic *en* is obligatorily present in the object case (33), yet impossible in the subject case (32).

The obligatoriness in (33) tracks:

(34) Tu *(en) a lu beaucoup. (‘you (of-them) have read a-great-deal’)

indicating that the movement of clitic *en* in (33) must be taking place prior to *wh*-movement. If so, then, since *wh*-movement is part of core syntax, so must be clitic movement (at least in this case), despite its semantic neutrality.

That clitic movement is part of core syntax is also suggested by its interaction with raising to subject position, in cases in French such as:

(35) Le premier chapitre semble en être intéressant. (‘the first chapter seems of-it to-be interesting’)

The clitic *en* (‘of it’) originates within the DP containing *le premier chapitre* (‘the first chapter’). It clearly must move to clitic position within the embedded infinitival phrase prior to the raising of *le premier chapitre*.²⁶ Since that raising is part of core syntax, so must the movement of *en* be, despite its semantic neutrality.

²⁴Relevant here is Chomsky’s (1995, 151) Full Interpretation principle, whose interaction with idioms needs to be clarified.

²⁵Cf. Kayne (1975, section 4.3) and Rizzi (1982, section 4.3)

²⁶For detailed discussion, see Ruwet (1972, chapter 2), Couquaux (1981) and Pollock (1998).

Finally, take verb raising of the sort discussed in Pollock (1989), which as Chomsky (2020) emphasizes is also semantically neutral. Yet in Kayne (1991) I argued that Romance infinitival verb raising has an effect on whether or not PRO is admissible as the subject of a Romance infinitival *if*-clause. In some Romance languages it is, and in others it is not, correlating with whether or not the Romance language in question moves its infinitives past the landing site of its object clitics. If so, then Romance infinitival verb raising must be part of core syntax, despite being semantically neutral.

12. Partial linear order and total linear order.

The position that I took in section 9, to the effect that Merge should always be taken to form the ordered pair $\langle X, Y \rangle$, rather than the set $\{X, Y\}$, introduces linear order into core syntax, but only in a partial way. The formation of the ordered pair $\langle X, Y \rangle$ can be taken to tell us that X is linearly ordered before Y, but at the same time it tells us nothing about subconstituents of X or of Y. In particular, it does not explicitly tell us that subconstituents of X are linearly ordered before subconstituents of Y.

Put another way, the Merge-based building up of syntactic structure via the formation of ordered pairs creates in core syntax a partial, but not a total, linear ordering. In a way reminiscent of Kayne (1994: 5), we can move to a total ordering by adopting:²⁷

(36) For all $\langle X, Y \rangle$, all the terminals dominated by X precede all the terminals dominated by Y.

If we now take (36) to be part of externalization, we reach the conclusion that core syntax involves a partial linear order, but not a total linear order. That partial linear order will suffice, however, if Kayne (2011; 2019a) is on the right track, to account for the fact that syntax is antisymmetric (in 1994 terms, to account for why the LCA holds).

13. Conclusion.

Antisymmetric linear order is part of core syntax. There are implications for externalization and in the longer run for the evolution of the language faculty.

References:

- Allan, R., P. Holmes and T. Lundskaer-Nielsen (1995) *Danish. A Comprehensive Grammar*, Routledge, London.
- Aoun, J.E., E. Benmamoun and L. Choueiri (2010) *The Syntax of Arabic*, Cambridge University Press, Cambridge.
- Baker, M.C. (1988) *Incorporation. A Theory of Grammatical Function Changing*, University of Chicago Press, Chicago, Ill.
- Baker, M.C. (2003) "Agreement, dislocation, and partial configurationality," in A. Carnie, H. Harley and M.A. Willie (eds.) *Formal Approaches to Function in Grammar*, John Benjamins, Amsterdam, 107-134.

²⁷Rizzi (2018, 343) notes the existence of (weaker, as compared with hierarchical) linear intervention effects. The weakness of these linear intervention effects may be due to their being dependent on the precedence relations induced by (36), outside of core syntax, as a result of externalization.

- Berwick, R.C. and N. Chomsky (2016) *Why Only Us. Language and Evolution*, The MIT Press, Cambridge, Mass.
- Biberauer, T., A. Holmberg and I. Roberts (2014) "A Syntactic Universal and Its Consequences," *Linguistic Inquiry*, 45, 169-225.
- Cecchetto, C. (1999) "A Comparative Analysis of Left and Right Dislocation in Romance," *Studia Linguistica*, 53, 40-67.
- Chomsky, N. (1995) *The Minimalist Program*, The MIT Press, Cambridge, Mass.
- Chomsky, N. (2008) "On Phases," in R. Freidin, C.P. Otero and M.L. Zubizarreta (eds.) *Foundational Issues in Linguistic Theory. Essays in Honor of Jean-Roger Vergnaud*, MIT Press, Cambridge, Mass., 291-321.
- Chomsky, N. (2019) "Some Puzzling Foundational Issues: The Reading Program," *Catalan Journal of Linguistics. Special Issue*, 263-285.
- Chomsky, N. (2020) "The UCLA Lectures", lingbuzz/005485.
- Chomsky, N., Á.J. Gallego and D. Ott (2019) "Generative Grammar and the Faculty of Language: Insights, Questions, and Challenges," *Catalan Journal of Linguistics Special Issue*, 229-261.
- Cinque, G. (1977) "The Movement Nature of Left Dislocation," *Linguistic Inquiry*, 8, 397-412.
- Cinque, G. (1990) *Types of A'-Dependencies*, The MIT Press, Cambridge, Mass.
- Cinque, G. (1999) *Adverbs and Functional Heads. A Cross-Linguistic Perspective*, Oxford University Press, New York.
- Cinque, G. (2005) "Deriving Greenberg's Universal 20 and Its Exceptions," *Linguistic Inquiry*, 36, 315-332.
- Cinque, G. (2009) "The Fundamental Left-Right Asymmetry of Natural Languages," in S. Scalise et al. (eds.) *Universals of Language Today*, Springer, 165-184.
- Cinque, G. (2020a) *The Syntax of Relative Clauses. A Unified Analysis*, Cambridge University Press, Cambridge.
- Cinque, G. (2020b) "Word order variation: towards a restrictive theory," ms., University of Venice.
- Couquaux, D. (1981) "French Predication and Linguistic Theory," in R. May and J. Koster (eds.) *Levels of Syntactic Representation*, Foris, Dordrecht, 33-64.
- Craig, C.G. (1977) *The Structure of Jacaltec*, University of Texas Press, Austin.
- Diesing, M. (1992) *Indefinites*, The MIT Press.
- Downing, B.T. (1978) "Some Universals of Relative Clause Structure," in J.H. Greenberg (ed.) *Universals of Human Language. vol. 4. Syntax*, Stanford University Press, Stanford, 375-418.
- Dryer, M.S. (1992) "The Greenbergian Word Order Correlations," *Language* 68, 81-138.
- Gildersleeve, B.L. and G. Lodge (1895) *Gildersleeve's Latin Grammar*, (reprint of the third edition), Bolchazy-Carducci, Wauconda, Illinois.
- Giorgi, A. and S. Haroutyunian (2020) "Verb Second and Verb Third in Modern Eastern Armenian," in R. Woods and S. Wolfe (eds.) *Rethinking Verb Second*, Oxford University Press, Oxford.
- Greenberg, J.H. (1966) "Some Universals of Grammar with Particular Reference to the Order of Meaningful Elements," in J.H. Greenberg (ed.) *Universals of Language*, second edition, The MIT Press, Cambridge, Mass., 73-113.
- Haegeman, L. (2001) "Antisymmetry and Verb-final Order in West Flemish," *The Journal of Comparative Germanic linguistics*, 3, 207-232.

- Haegeman, L. (2002) "West Flemish Negation and the Derivation of SOV Order in West Germanic," *Nordic Journal of Linguistics*, 25, 154-189.
- Huang, C.T.J. (1998) *Logical Relations in Chinese and the Theory of Grammar*, Garland, New York.
- Hyman, L.M. and D.J. Magaji (1970) *Essentials of Gwari Grammar*, Institute of African Studies, University of Ibadan.
- Jayaseelan, K.A. (1991) "The Pronominal System of Malayalam," *CIEFL Occasional Papers in Linguistics*, 3, 68-107.
- Jayaseelan, K.A. (2001) "IP-internal Topic and Focus Phrases," *Studia Linguistica* 55, 39-75.
- Johannessen, J.B. (1998) *Coordination*, Oxford University Press, New York.
- Johnson, K. (1991) "Object Positions," *Natural Language and Linguistic Theory*, 9, 577-636.
- Kandybowicz, J. and M.C. Baker (2003) "On Directionality and the Structure of the Verb Phrase: Evidence from Nupe," *Syntax* 6, 115-155.
- Kayne, R.S. (1975) *French Syntax. The Transformational Cycle*, The MIT Press, Cambridge, Mass.
- Kayne, R.S. (1981) "Unambiguous Paths," in R. May and J. Koster (eds.) *Levels of Syntactic Representation*, Foris, Dordrecht, 143-183 (reprinted in Kayne (1984)).
- Kayne, R.S. (1983) "Connectedness," *Linguistic Inquiry*, 14, 223-249 (reprinted in Kayne (1984)).
- Kayne, R.S. (1984) *Connectedness and Binary Branching*, Foris, Dordrecht.
- Kayne, R.S. (1991) "Romance Clitics, Verb Movement and PRO," *Linguistic Inquiry*, 22, 647-686 (reprinted in Kayne (2000)).
- Kayne, R.S. (1994) *The Antisymmetry of Syntax*, The MIT Press, Cambridge, Mass.
- Kayne, R.S. (2000) *Parameters and Universals*, Oxford University Press, New York.
- Kayne, R.S. (2002) "Pronouns and Their Antecedents" in S. Epstein and D. Seely (eds.), *Derivation and Explanation in the Minimalist Program*, Blackwell, Malden, Mass., 133-166 (reprinted in Kayne (2005b)).
- Kayne, R.S. (2003) "Some Remarks on Agreement and on Heavy-NP-Shift", in M. Ukaji, M. Ike-Uchi and Y. Nishimara (eds.) *Current Issues in English Linguistics* (Special Publications of the English Linguistic Society of Japan, volume 2), Kaitakusha, Tokyo, 67-86 (reprinted in Kayne (2005b)).
- Kayne, R.S. (2005a) "On the Syntax of Quantity in English", in Kayne (2005b) (also in J. Bayer, T. Bhattacharya and M. T. Hany Babu (eds.), *Linguistic Theory and South-Asian Languages. Essays in Honour of K.A. Jayaseelan*, John Benjamins, Amsterdam.)
- Kayne, R.S. (2005b) *Movement and Silence*, Oxford University Press, New York.
- Kayne, R.S. (2011) "Why Are There No Directionality Parameters?" in M. Byram Washburn, K. McKinney-Bock, E. Varis, A. Sawyer and B. Tomaszewicz (eds.) *Proceedings of the 28th West Coast Conference on Formal Linguistics*, Cascadilla Proceedings Project, Somerville, MA, 1-23.
- Kayne, R.S. (2016) "The Silence of Heads", *Studies in Chinese Linguistics*, 37, 1-37 (reprinted in Kayne 2019b).
- Kayne, R.S. (2019a) "The Place of Linear Order in the Language Faculty", *Linguistic Analysis*, 42.
- Kayne, R.S. (2019b) *Questions of Syntax*, Oxford University Press, New York.

- Keenan, E.L. (1985) "Relative Clauses," in T. Shopen (ed.) *Language Typology and Syntactic Description. Volume II. Complex constructions*, Cambridge University Press, Cambridge, 141-170.
- Koopman, H. (1992) "On the Absence of Case Chains in Bambara," *Natural Language and Linguistic Theory*, 10, 555-594.
- Kornfilt, J. (2000) "Locating Relative Agreement in Turkish and Turkic," in A. Göksel and C. Kerslake (eds.) *Studies on Turkish and Turkic Languages*, Harrassowitz Verlag, Wiesbaden, 189-196.
- Koster, J. (1994) "Predicate incorporation and the word order of Dutch," in G. Cinque, J. Koster, J.-Y. Pollock, L. Rizzi, and R. Zanuttini (eds.) *Paths toward Universal Grammar. Studies in honor of Richard S. Kayne*, Georgetown University Press, Washington, D.C., 255-276.
- Langacker, R.W. (1969) "On Pronominalization and the Chain of Command," in D. Reibel and S. Schane (eds.) *Modern Studies in English. Readings in Transformational Grammar*, Prentice Hall, Englewood Cliffs, New Jersey, 160-186.
- Larson, R.K. (1988) "On the Double Object Construction," *Linguistic Inquiry*, 19, 335-391.
- Larson, R.K. (1990) "Double Objects Revisited: Reply to Jackendoff," *Linguistic Inquiry*, 21, 589-632.
- Lasnik, H. (1976) "Remarks on Coreference," *Linguistic Analysis*, 2, 1-22.
- Mahajan, A. (1992) "The Specificity Condition and the CED," *Linguistic Inquiry*, 23, 510-516.
- McCloskey, J. and P. Sells (1988) "Control and A-Chains in Modern Irish," *Natural Language and Linguistic Theory*, 6, 143-189.
- Moro, A. et al. (2003) "Broca's area and the language instinct," *Nature Neuroscience*.
- Nkemnji, M.A. (1992) *Issues in the Syntax of Negation in Nweh*, Master's thesis, UCLA.
- Nkemnji, M.A. (1995) *Heavy pied-piping in Nweh*, Doctoral dissertation, UCLA.
- Nurse, D. and G. Philippson, eds. (2003) *The Bantu Languages*, Routledge, London.
- Ott, D. 2014. "An Ellipsis Approach to Contrastive Left-dislocation", *Linguistic Inquiry*, 45, 269-303.
- Paster, M. (2019) "Phonology Counts," *Radical. A Journal of Phonology*, 1, 1-61.
- Pearson, M. (2000) "Two types of VO languages," in P. Svenonius (ed.) *The Derivation of VO and OV*, John Benjamins, Amsterdam, 327-363.
- Pollock, J.-Y. (1989) "Verb Movement, Universal Grammar, and the Structure of IP," *Linguistic Inquiry*, 20, 365-424.
- Pollock, J.-Y. (1998) "On the Syntax of Subnominal Clitics: Cliticization and Ellipsis," *Syntax*, 1, 300-330.
- Postma, G. (1994) "The indefinite reading of WH," in R. Bok-Bennema & C. Cremers (eds.) *Linguistics in the Netherlands 1994*, John Benjamins, Amsterdam, 187-198.
- Rizzi, L. (1982) *Issues in Italian syntax*, Foris, Dordrecht.
- Rizzi, L. (1997) "The fine structure of the left periphery," in L. Haegeman (ed.) *Elements of Grammar. Handbook of Generative Syntax*, Kluwer, Dordrecht, 281-337.
- Rizzi, L. (2018) "Intervention effects in grammar and language acquisition," *Probus*, 30, 339-367.
- Ruwet, N. (1972) *Théorie syntaxique et syntaxe du français*, Editions du Seuil, Paris.
- Saito, M. and N. Fukui (1998) "Order in Phrase Structure and Movement," *Linguistic Inquiry* 29, 439-474.

- Sheehan, M. (2017) "The Final-over-Final Condition and Adverbs," in Sheehan et al. (2017), 97-120.
- Sheehan, M., T. Biberauer, I. Roberts and A. Holmberg (2017) *The Final-Over-Final Condition. A Syntactic Universal*, The MIT Press, Cambridge, Mass.
- Stassen, L. (2000) "AND-languages and WITH-languages," *Linguistic Typology*, 4, 1-54.
- Tamrazian, A. (1994) *The Syntax of Armenian: Chains and the Auxiliary*, Doctoral dissertation, University College London.
- Thráinsson, H., H.P. Petersen, J.ÍL. Jacobsen and Z.S. Hansen (2004) *Faroese. An Overview and Reference Grammar*, Foroya Frodskaparfelag.
- Torrence, Harold. (2005) *On the Distribution of Complementizers in Wolof*, Doctoral dissertation, UCLA.
- Travis, L. (1989) "Parameters of Phrase Structure," in A.S. Kroch and M.R. Baltin (eds.), *Alternative Conceptions of Phrase Structure*, University of Chicago Press, 263-279.
- Villalba, X. (1999) "Right Dislocation is not Right Dislocation," in O. Fullana and F. Roca (eds.) *Studies on the Syntax of Central Romance Languages. Proceedings of the III Symposium on the Syntax of Central Romance Languages*, Universitat de Girona, 227-241.
- Whitman, J. (2005) "Preverbal Elements in Korean and Japanese," in G. Cinque and R.S. Kayne (eds.) *Handbook of Comparative Syntax*, Oxford University Press, New York, 880-902.
- Wilder, C. (1997) "Some Properties of Ellipsis in Coordination," in A. Alexiadou and T.A. Hall (eds.) *Studies on Universal Grammar and Typological Variation*, John Benjamins, Amsterdam, 59-107.
- Zwart, J.-W. (2007) "Some Notes on the Origin and Distribution of the IPP-effect," *Groninger Arbeiten zur Germanistischen Linguistik*, 45, 77-99.
- Zwart, J.-W. (2009) "Relevance of Typology to Minimalist Inquiry," *Lingua*, 119, 1589-1606.