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Antisymmetry and Externalization

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Abstract

There are no mirror-image pairs of languages. This restriction on the otherwise vast set of possible languages must be accounted for, and puts boundary conditions on any theory of the human language faculty. There are implications for externalization and in the longer run for the evolution of the language faculty. Antisymmetric linear/temporal order is part of core syntax. Temporal order is partly (though not fully) integrated into core syntax via Merge itself. When two elements X and Y are merged, a relative linear/temporal order is assigned to them. At the same time, that instance of Merge assigns no relative order to the subparts of X and Y. Core syntax can explicitly have X precede Y without having any subpart of X precede any subpart of Y.

Keywords

antisymmetry, externalization, linear, temporal, evolution

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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.[1] 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:[2]

(2) Arguments invariably raise at least once, in all languages.[3]

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.[4] From (4) it then follows

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1 For example, Iatridou (1990), while disagreeing with some aspects of Pollock (1989), agrees that verbs raise in tensed sentences. In a very general way, Pollock's position has been considerably strengthened by Cinque (1999) (cf. especially Cinque's Appendix 1).

2 Cf. Kayne 2011. This conjecture may be related to the Decompositionality Principle of Kayne (2005a: Appendix).

3 I am 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 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.

4 Cf. Nurse and Philippson 2003, *passim*.

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 Exceptional Case-Marking (ECM) traditions say no for a certain class of apparent objects.[5] 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.[6]

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

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5 Cf. Kayne 1981 on DOCs.

6 Put another way, OV order in Japanese is to be reduced to one or another (perhaps more than one) of the various instances of canonical leftward object movement mentioned in this section for other languages.
Whether or not these object movements are "triggered" is a partially separate question. The triggering of movement was of little importance to Kayne (1994) (cf. p.140, note 3), and has been turned away from in Chomsky et al. 2019: 237–238.
Also partially separate is the question of "shape preservation" discussed by Shu (2018) and references cited there. Taken as a general principle, shape preservation (which could perhaps be formulated in a way compatible with antisymmetry) would have to come to grips with counterexamples such as negative phrase movement in Scandinavian (cf. Christensen 1986 and Svenonius 2000), stylistic fronting in Icelandic (cf. Ingason and Wood 2017), the movement of *tout* 'all' and *rien* 'nothing' in French (cf. Kayne 1975: Chap. 1), many instances of the movement of object clitics in Romance languages (cf. Kayne 1991) and V-2 of the Germanic sort.

Lokąą, movement of O by itself is called for in Nupe. (This difference correlates, as they show, with the fact that Nweh and Lokąą have S-PP-X-V, whereas Nupe does not.)

The OAuxV order that Lokąą 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 the (embedded instances of) so-called Infinitivus Pro Participio (Infinitive For Participle - IPP) sentences, as discussed by Zwart (2007) among others. An example from German would be:

(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 of 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).[7] (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

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

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.[8]

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 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.[9]

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

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8 The interesting Mande facts discussed by Nikitina (2019) may be amenable to a remnant movement account, whereby the PP is extracted from the non-finite complement prior to that complement being moved to the left of the main verb.

9 For much relevant discussion, see Biberauer et al. 2014 and Sheehan et al. 2017.

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 clitic left-dislocation (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 and, for Japanese right-dislocation, Tanaka 2001; but this does not hold for CLLD,[10] 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.[11]

5 Antisymmetry and relative clauses

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

(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.[12] 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

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[10] Cf. Ott 2014.

[11] Cf. 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.

[12] For an opposing view, see Cinque 2020a.

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.[13] In antisymmetric terms, this seems to be telling us that *and* is a head,[14] that the two conjuncts are specifier and complement of *and*, and that the order is as it is in (11a) because Spec-Head-Complement (S-H-C) order is the only order made available by the language faculty.

Concerning (11b), Zwart is in agreement with Stassen (2000: 15).[15] 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).

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

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

[14] Cf. Larson 1990: 595, Kayne 1994: Chap. 6, Johannessen 1998: Sect. 3.2, and Zhang 2010: 2.

[15] I am grateful to Guglielmo Cinque for bringing Stassen 2000 to my attention.

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.[16] (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,[17] as well as by the following contrast involving the bound reading of *his*:[18]

(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

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[16] Cf. 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".

[17] Cf. also first conjunct agreement in Arabic, as discussed by Aoun et al. (2010: Sects. 4.3, 4.4).

[18] Cf. Wilder 1997: 64.

adverbs between Aux and V, as in English *John has recently seen Mary*, whereas VAux languages generally do not.[19] 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 (of the sort that has all the pieces of the VP ending up preceding V) 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:[20]

(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.[21]

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.[22]

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

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[19] Cf. Sheehan 2017.

[20] For early discussion, see Langacker 1969.

[21] Cf. Berwick and Chomsky 2016: 118ff.

[22] For a proposal on why backwards pronominalization is cross-linguistically more restricted, see Kayne 2002: Sect. 13.

differs from the position taken in Kayne 1994. We can now ask to what extent antisymmetry in 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 order is dependent on structure; in particular for every projection, the mapping to linear order must invariably yield S-H-C 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.[23]

The question remains, though, as to why antisymmetry holds (in 1994 terms, why the Linear Correspondence Axiom (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 <X,Y>, 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.[24] Thus, starting from:

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[23] If one agreed that linear order doesn't come into play in core syntax.

[24] Indirectly relevant here is the question whether Internal Merge is triggered; for Chomsky (2019: 268) it is not.

(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:[25]

(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:

(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:[26]

(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.

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[25] For relevant discussion of parasitic gaps, cf. Kayne 1983.

[26] The 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.

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.[27]

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 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.[28]

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 (including in VO languages) will have been moved there in what appears to be a semantically vacuous way (unless the semantics pays

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[27] On 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: Sect. 15.

[28] Relevant here is Chomsky's (1995: 151) Full Interpretation principle, whose interaction with idioms needs to be clarified.

important attention to the link between even an argument in canonical position and its trace).

But what I am 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:[29]

(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 beacoup.
'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

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[29] Cf. Kayne 1975: Sect. 4.3 and Rizzi 1982: Sect. 4.3.

infinitival phrase prior to the raising of *le premier chapitre*.[30] Since that raising is part of core syntax, so must the movement of *en* be, despite its semantic neutrality.

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 <X,Y>, rather than the set {X,Y}, introduces linear order into core syntax, but only in a partial way. The formation of the ordered pair <X,Y> 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:[31]

(36) For all <X,Y>, 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.

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[30] For detailed discussion, see Ruwet 1972: Chap. 2, Couquaux 1981 and Pollock 1998.

[31] Rizzi (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.

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反對稱與外部化

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提要

世上沒有成對的鏡像語言。在芸芸語言中，何以有此限制，需要解釋，而此限制加諸人類語言機制的邊界條件，任何理論也需面對。對於外部化理論（以至長遠來說，對於語言機制的演化研究），相關討論都有著種種影響。反對稱的線性或時間順序是核心句法的一部分。雖非完全如此，但時間順序總在某程度上通過合併操作併入核心句法當中。當 X、Y 兩個成分合併的時候，已有相對線性或時間順序。與此同時，該合併操作並沒有定出 X 和 Y 子部分的相對順序。核心句法能明確地決定 X 先於 Y，但不要求 X 的子部分須先於 Y 的子部分。

關鍵詞

反對稱性，外部化，線性，時間性，演化