Two Asymmetries between Pre- and Post-Head Order and their Implications for Syntactic Theory

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Greenberg's (1963) Universal 20 can be roughly summarized as 'fixed word order preceding the head; variable word order following it'. The cross-linguistic distribution of scrambling/case adjacency displays the opposite pattern: there is variable word order preceding the head (scrambling), and fixed word order following it (case adjacency). These generalizations are of course not on a par: Universal 20 describes cross-linguistic word order variation, while scrambling is a language-internal phenomenon. Nevertheless, it can be demonstrated that popular analyses of Universal 20 and scrambling/case adjacency are incompatible. This incompatibility can be avoided if (i) the idea of a single functional hierarchy spanning the entire verbal extended projection is rejected (see also Bobaljik 1999), and (ii) the syntax is sensitive to linear order (thus allowing constraints that require some element to precede another). In the resulting proposal, the position of the head is associated with further word order restrictions in a way approaching the ideal of a parameter that has consequences beyond the data that trigger its setting.

1. Introduction

In this paper I consider two problems that have been discussed in detail in the literature, but that have not been connected. Although the two problems are distinct and require different solutions, the solution to the first problem bears on the solution chosen for the second. This has not been noted before, I think, even though there is nothing particularly controversial in the argumentation that links one problem to the other.

The two problems are the typological pattern known as Universal 20 and the observation that all OV-languages have scrambling, while many VO-languages do not. Both generalizations describe unexpected word order asymmetries

The background to these problems is the same. Phrase structure, if combined with a universal order of merger of constituents, predicts mirror image effects when one compares head-initial and head-final structures. Suppose that some head *h* combines with a category YP and subsequently with a category XP. Suppose, moreover, that there is crosslinguistic variation in the linearization of sister nodes. Then, the following structures can be generated:

(1) a. [XP [YP h]]
b. [XP [h YP]]
c. [[YP h] XP]
d. [[h YP] XP]

On the further assumption that YP cannot c-command XP, the following structures are ruled out:

(2) a. *[YP [XP h]]
b. *[YP [h XP]]
c. *[[XP h] YP]
d. *[[h XP] YP]

Thus, we should expect mirror image effects where c-command relations between categories are fixed: when XP and YP both precede the head, as in (1a), their order is the opposite of the order generated when YP and XP both follow the head, as in (1d). This prediction comes for

free: if language has structure at all, it should display the kind of symmetries illustrated in (1) and (2).

Many examples of mirror image effects can be found. In English, adverbs may either precede or follow the verb. When they precede, they come in the order that matches their scope (adverbs further to the left take scope over adverbs further to the right). When they follow, their order tends to be reversed (adverbs further to the right, with some exceptions, take scope over adverbs further to the left). This pattern can be exemplified using time and manner adverbs. Manner adverbs appear lower in the tree than time adverbials, and therefore when a time and manner adverb appear on the same side of the verb, the manner adverb is consistently closer to the verb:

(3) a. Yesterday$_{XP}$ Brian wistfully$_{YP}$ looked$_{h}$ at the stars.
b. *Wistfully$_{YP}$ Brian yesterday$_{XP}$ looked$_{h}$ at the stars.
c. Brian looked$_{h}$ at the stars wistfully$_{YP}$ yesterday$_{XP}$.
d. *Brian looked$_{h}$ at the stars yesterday$_{XP}$ wistfully$_{YP}$.

In Dutch, prepositional phrases can appear either to the left or to the right of the verb. Koster (1974) observes that the preferred order among PPs when they occur in preverbal position is the reverse of their postverbal order. This is particularly clear when one PP is selected by the verb and the other is not, as in (4). (Note that the judgments given concern neutral order.)

(4) a. Jan zat [tijdens de pauze]$_{XP}$ [aan zijn vader]$_{YP}$ te denken$_{h}$
John sat during the break of his father to think
'John sat and thought of his father during the break'
b. ??Jan zat [aan zijn vader]$_{YP}$ [tijdens de pauze]$_{XP}$ te denken$_{h}$
John sat of his father during the break to think
c. Jan zat te denken$_{h}$ [aan zijn vader]$_{XP}$ [tijdens de pauze]$_{YP}$
John sat to think of his father during the break
d. ??Jan zat te denken$_{h}$ [tijdens de pauze]$_{YP}$ [aan zijn vader]$_{XP}$
John sat to think during the break of his father

The phenomenon is not limited to verbal structures. In Tagalog, adjectives are freely ordered with respect to the noun, but show mirror image effects (Norvin Richards, personal communication; note that the linker *na* changes into *ng* after a vowel):

(5) a. pinakamalapit-na$_{XP}$ pula-ng$_{YP}$ bahay$_{h}$
nearest-LNK red-LNK house
'the nearest red house'
b. *pula-ng$_{YP}$ pinakamalapit-na$_{XP}$ bahay$_{h}$
red-LNK nearest-LNK house
c. bahay$_{h}$ na-pula$_{YP}$ ng-pinakamalapit$_{XP}$
house LNK-red LNK-nearest
d. *bahay$_{h}$ na-pinakamalapit$_{XP}$ na-pula$_{YP}$
house LNK-nearest LNK-red

Of course, not every language allows constituents to freely precede or follow the head. This implies that mirror image effects can often be detected only if the word orders of different languages are compared. For example, in Dutch adverbs precede the verb, so only the partial pattern in (6) is attested. That there is a mirror image effect requires comparison with head-initial structures, such as the English examples in (3c,d).

(6) a. Brian zat gisteren$_{XP}$ triest$_{YP}$ naar de sterren te kijken$_{h}$
Brian sat yesterday wistfully to the stars to look
'Brian sat and looked at the stars wistfully yesterday.'
b. *Brian zat triest$_{YP}$ gisteren$_{XP}$ naar de sterren te kijken$_{h}$
Brian sat wistfully yesterday to the stars to look

Similarly, English has only postverbal PPs. That the data in (7) are part of a larger mirror pattern requires a comparison with head-final structures, say the Dutch examples in (4a,b).

(7) a. John was thinking$_{h}$ [of his father]$_{YP}$ [during the break]$_{XP}$.
b. ??John was thinking$_{h}$ [during the break]$_{XP}$ [of his father]$_{YP}$.

This point carries over to the noun phrase. English has prenominal adjectives. The fact that (8) is part of a mirror pattern can only be seen when, say, the Tagalog examples in (5c,d) are taken into account.

(8) a. the nearest$_{XP}$ red$_{YP}$ house$_{h}$
b. *the red$_{YP}$ nearest$_{XP}$ house$_{h}$

Thus, all else being equal, the theory of phrase structure comes with an expectation of mirror image effects, both language-internally and across languages.

The two problems explored in this paper stem from cases where the mirror image effect breaks down.. Given the above, one would not expect to find structures in which word order to the left of the head is fixed, but word order to the right is variable, as in (9) (where the shaded order is ungrammatical). Yet, exactly this is the core content of Greenberg's Universal 20, which is cited in (10). (Note that the orders mentioned are intended to be neutral orders; when contrast is brought into the picture, many additional orders are attested, obscuring the generalization.)

(9)

XP YP h	h YP XP
YP XP h	h XP YP

"U20 pattern"

(10) When any or all of the items – demonstrative, numeral, and descriptive adjective – precede the noun, they are always found in that order. If they follow, the order is either the same or its exact opposite. (Greenberg's (1963:111) Universal 20).

A few quick examples. The order Demonstrative – Numeral – Adjective – Noun is attested in English. The same order of modifiers is found postnominally in Kîîtharaka. The mirror image of the English order (N-AP-Num-Dem) is found in Gungbe, but the mirror image of the Kîîtharaka order (AP-Num-Dem-N) remains unattested:[1]

(11) a. these five empty bottles
b. i-kombe bi-bi bi-tano bi-tune *Kîîtharaka* (Peter Muriungi, p.c.)
8-cup 8-this 8-five 8-red
'these five red cups'

[1] I assume attributive adjectival modifiers are maximal projections; I remain agnostic about the phrase-theoretical status of numerals and demonstratives. None of this affects the point made here

[2] Henk van Riemsdijk (personal communication) suggests that, in addition, some free word order languages traditionally analyzed as VO may in reality have a verb-final base (see Ackema 2004 for related discussion of Hungarian). Anticipating some of the conclusions reached below, the short verb movement required to derive

c. távò ɖàxó xóxó àtɔn éhè lɔ lɛ́ *Gungbe* (Aboh 2004)
table big old three DEM SPF PL
d. *Adjective – Numeral – Demonstrative – Noun

One would also not expect to find structures in which word order to the right of the head is fixed, but word order to the left is variable, as in (12). But the cross-linguistic distribution of scrambling comes close to this pattern. All OV-languages allow both the order the order Object – Adverbial – Verb alongside AdvP-O-V. VO-languages show some variation, but if one controls for factors that may independently lead to separation of verb and object (such as verb movement, clitic doubling, heavy XP-shift and morphological case), the only order permitted is V-O-AdvP (see Corver and Van Riemsdijk 1997 for related discussion).[2] *V-AdvP-O is ruled out as a violation of case adjacency (Stowell 1981), the sisterhood condition on theta-assignment (Chomsky 1986), or some other comparable principle.

(12)

XP YP h	h YP XP
YP XP h	h XP YP

"Anti-U20 pattern"

Thus, within Germanic, adverbial intervention is allowed in Dutch, Flemish, Frisian and German (all OV-languages), but ruled out in Danish, English, Icelandic, Norwegian and Swedish (all VO-languages).

The reason these two exceptions to the pattern in (1) and (2) should be considered together is that an explanation for scrambling may well undermine the account of the pre-head rigidity laid down in Universal 20. Similarly, an explanation of variable order following the noun may well be incompatible with an account of the post-head rigidity described by case adjacency. Such problems arise, I will argue, despite the fact that Universal 20 describes cross-linguistic word order variation while scrambling is a language-internal phenomenon.

The paper is organized as follows. In section 2, I review some of the work on Universal 20. In section 3, I turn to standard movement analyses of scrambling, and argue that these either fail to capture the correlation with OV-order or run counter to assumptions required to account for Universal 20. This leads – in section 4 – to a rejection of the hypothesis that the verb and its objects form an underlying core constituent excluding all adverbials (Chomsky 1965). The alternative I adopt (borrowed from Bobaljik 1999) allows variation in the order in which arguments and adverbials are merged. In section 5, I show that such variation permits a base-generation analysis of scrambling that makes it possible to explain the link between OV-order and scrambling and that is fully compatible with the account of Universal 20 earlier (in section 2). Sections 6 shows that it is probably not possible to neutralize the argument presented here by claiming that the movement regimes for the nominal and verbal extended projections are somehow different. Section 7 contains some speculations and conclusions.

2. Universal 20

The data in (11) are summarized in the following table, where the shaded order is unattested (and presumed to be ungrammatical).

(13)

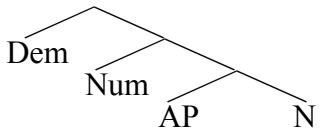
Dem Num AP N	N AP Num Dem
AP Num Dem N	N Dem Num AP

U20 pattern

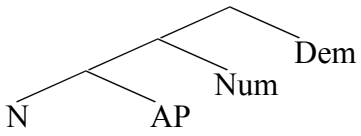
[2] Henk van Riemsdijk (personal communication) suggests that, in addition, some free word order languages traditionally analyzed as VO may in reality have a verb-final base (see Ackema 2004 for related discussion of Hungarian). Anticipating some of the conclusions reached below, the short verb movement required to derive VO-order would fit the movement regime for neutral orders.

A simple account of this limited set of observations is available, as long as one is willing to accept a linear constraint on movement (see Ackema and Neeleman 2002; for an earlier analysis based on the more wide-ranging linear constraint of anti-symmetry, see Cinque 1996). Suppose that there is a universal hierarchy of merger that requires that AP combine with N before Num, and Num before Dem. Two of the orders in (13) can then be base-generated (on the assumption made in section 1 that languages may vary in the way they linearize trees). These orders form the symmetric pair Dem-Num-AP-N and N-AP-Num-Dem:

(14) a.

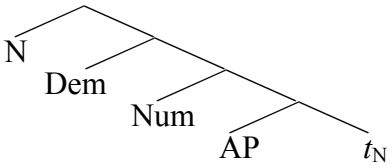


b.

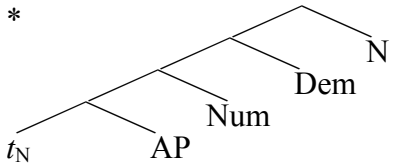


The two remaining orders cannot be base-generated (because N is not adjacent to AP). The first can be derived from (14a) by leftward movement of N (see (15a)). The second would require rightward movement of N, with (14b) as the underlying structure (see (15b)).

(15) a.



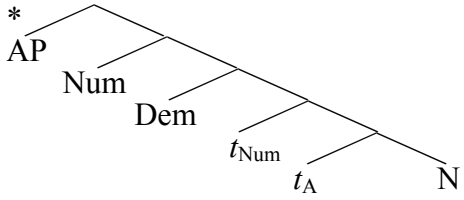
b. *



Therefore, the pattern in (13) follows if we assume that N-movement must be leftward. In other words, while phrase structure is symmetrical, the gap in this small sample of orders reveals that certain types of movement are asymmetric.

This is not quite enough. The unattested order AP-Num-Dem-N could also be derived from (14a) by leftward movement of AP and Num (as in (16)). It probably will not do to rule out these operations altogether. Recall, however, that Universal 20 is a generalization about neutral orders. It is likely that movement of modifiers can only deliver marked orders, given that phrasal movement, as opposed to head-movement, typically has interpretive effects (see Chomsky 1995).

(16) *



The assumptions that make up the analysis are repeated below:

(17) (i) Phrase structure is symmetric: languages vary in the linearization of structure.
(ii) There is a universal hierarchy Dem > Num > AP > N.
(iii) X^0-movement is asymmetric: it must be is leftward.
(iv) Neutral orders are base-generated or derived by X^0-movement.

Of course, given that we considering four elements, there are twenty-four logically possible orders that must be considered. The question thus presents itself whether the account given above scales up to reality. Abels and Neeleman (2009, 2012) argue that it does.

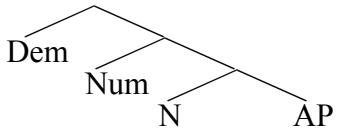
Cinque (2005) provides a careful and detailed assessment of the available typological evidence, arguing that only fourteen of the twenty-four logically possible orders of demonstrative numeral, adjective and noun are attested as the neutral order of one or more languages. His findings are summarized in the following table, with unattested orders shaded as before.

(18)

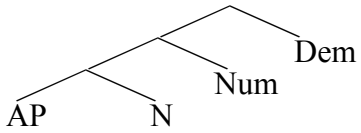
	I	II	III	IV
a.	Dem Num AP N	N AP Num Dem	Dem N Num AP	AP Num N Dem
b.	Dem Num N AP	AP N Num Dem	N Dem Num AP	AP Num Dem N
c.	Dem AP N Num	Num N AP Dem	AP N Dem Num	Num Dem N AP
d.	Dem N AP Num	Num AP N Dem	N Num AP Dem	Dem AP Num N
e.	AP Dem Num N	N Num Dem AP	N Dem AP Num	Num AP Dem N
f.	AP Dem N Num	Num N Dem AP	N AP Dem Num	Num Dem AP N

In addition to the structures in (14), three other symmetric pairs can be generated without movement, given in (19a,b), (19c,d) and (19e,f). These correspond to the attested orders in (18Ib,IIb), (18Ic,IIc) and (18Id,IId), respectively. None of the remaining order can be base-generated.

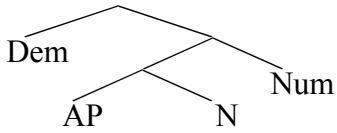
(19) a.



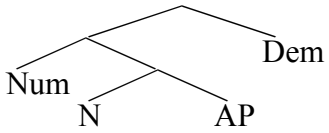
b.



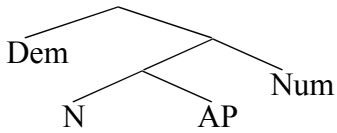
c.



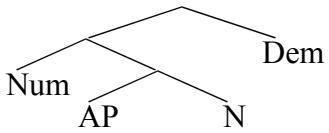
d.



e.

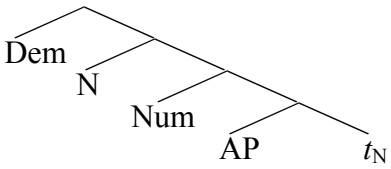


f.

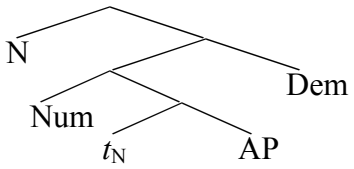


In addition to (15a), three more grammatical structures can be generated by movement of N, as demonstrated in (20). These correspond to the attested orders in (18IIIa,d,e).

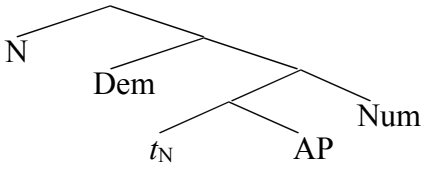
(20) a.



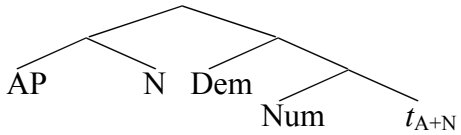
b.

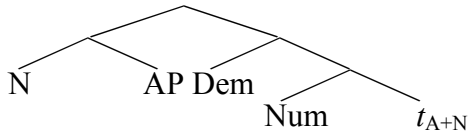


c.



The two remaining attested orders in (18IIIc,f) can also be generated though movement, provided we make a minimal adjustment to the rule in (17iii): N-movement must be allowed to pied-pipe other material (in practice AP, but allowing pied-piping of Num and Dem does not lead to new grammatical orders). The structures thus permitted are given in (21).

(21) a. 

b. 

In sum, all attested orders can be derived on the basis of assumptions in (22), which are identical to those given before, except that X^0 is replaced by X^+ in order to indicate that the relevant generalizations extend to cases involving pied-piping.

(22) (i) Phrase structure is symmetric: languages vary in the linearization of structure.
(ii) There is a universal hierarchy Dem > Num > AP > N.
(iii) X^+-movement is asymmetric: it must be is leftward.
(iv) Neutral orders are base-generated or derived by X^+-movement.

Showing that a given order can be generated is easy, but showing that it is ruled out requires a little more explanation.

If we look at the bigger picture, it is striking that none of the orders derived by movement have a symmetrical counterpart (see the columns in (18III,IV). This is of course in accordance with the claim that the asymmetry in the system is not part of the theory of phrase structure, but due to a ban on rightward movement of N (or N+AP).

I now consider the shaded orders in (18) in a little more detail. Given the hierarchy of merger in (22ii), AP and N must be adjacent in any base-generated structure. Conversely, if they are separated, movement must have taken place. Since AP cannot move, and N cannot move rightward, it is impossible to separate AP and N if they come in this order (see (23a). Similarly, given that Num must be adjacent to AP+N in any base-generated structure, the order in (23b) is excluded.

(23) a. *AP … X … N
b. *Num … X … AP+N

These restrictions explain why (18Ie,f) and all of (18III) are unattested.

Two unattested orders remain, namely (18IIe,f). In these orders, AP and N are separated, suggesting that N has moved (leftward, as required). But this in turn implies that the base structure for both (18IIe) and (18IIf) must have been Num-Dem-AP-N or Num-Dem-N-AP. However, neither of these latter orders can be generated under the assumptions in (22) (compare (18IIIc,f)).

I take the results outlined above to be robust: the analysis is firmly anchored in fact and relies on a limited set of simple hypotheses.

Note that most of the assumptions in (22) are shared across frameworks. Cinque (2005), whose landmark paper provides an antisymmetric analysis of Universal 20, argues in favor of variants of (22ii,iv). Antisymmetry of course subsumes (22iii). This leaves (22i), which is replaced by a range of roll-up movements.

One should of course ask what scope the proposed analysis has – if it is only applicable to word order in the noun phrase, it would be of little relevance to the theory of syntax as a whole. However, in view of the principles involved, limiting the analysis to the noun phrase would be quite arbitrary. The assumption in (22i) has been part of phrase structure theory since its inception (see Partee et al. 1990); (22ii) is a particular instance of the widely accepted idea that there are syntactic hierarchies; (22iii) fits in with the observation that movement to the right is very much more restricted than movement to the left (Ross 1967, Bach 1971, Perlmutter 1983, and Kayne 1994); and (iv) is really not saying much more than that head movement is semantically vacuous, which may or may not be true in general, but is

certainly accurate for the majority of head movements. We should therefore expect to find the Universal 20 pattern (fixed order to the left of the head, variable order to its right), wherever there is a universal hierarchy and movement.[3]

3. Scrambling as Movement

This, of course, brings us to the fact that OV-languages, apparently without exception, allow adverbial intervention, while VO-languages require the verb and its object to be adjacent.[4,5] The analysis of these data goes back to Chomsky 1965, where it was assumed that the verb and its objects form a core constituent excluding all adverbials ('VP'). Adverbials were hosted by a higher-level constituent ('PredP'). In other words, Chomsky postulates a hierarchy AdvP > DP > V, which in much subsequent work is taken to be universal. This hierarchy captures the English pattern, assuming no movement takes place:

(24) a. John [[read the telegram] slowly].
b. *John [[read slowly] the telegram].

However, Chomsky's hierarchy does not mesh well with the word order freedom found in OV-languages like Dutch:

(25) a. Jan heeft [langzaam [het telegram gelezen]].
John has slowly the telegram read
b. Jan heeft [het telegram [langzaam gelezen]].
John has the telegram slowly read

These data constitute an anti-U20 pattern:

(26)

AdvP DP V	V DP AdvP
DP AdvP V	V AdvP DP

Anti-U20 pattern

Of course, scrambling is a language-internal phenomenon, while Universal 20 describes cross-linguistic word order variation. I will show that, notwithstanding this contrast, the anti-U20 pattern found with scrambling is potentially problematic. Consider the following straw man analysis. In English, adverbials can precede or follow the verb. So, in addition to (24a), the structure in (27) exists:

(27) John [slowly [read the telegram]].

Suppose the same is true in Dutch. Then, the word order alternation in (25) could be explained in terms of linearization of the adverb in combination with constant rightward verb movement across all adverbial positions:

[3] Word order patterns reminiscent of Universal 20 have been uncovered elsewhere. A particularly interesting case is that of Germanic verb clusters. Abels (2012a,b) suggests that the orders found in three-verb clusters containing a particle form a good (though not perfect) match with the table in (18), and can be explained in terms of the assumptions in (22i,iii,iv), combined with the hierarchy of the cluster.

[4] Here and below, I use Dutch to represent OV-languages and English to represent VO-languages, as it will be important to discuss certain data sets in some detail. The two languages are similar in a number of respects (both are Germanic languages that lack morphological case). This makes it easier to compare the effects of the headedness parameter.

[5] In the main text, I will abstract away from A'-scrambling, which is a movement operation licensed by contrast in Dutch and other languages (see Neeleman 1994a and Neeleman and van de Koot 2008).

(28) a. Jan heeft [langzaam [het telegram t_V]] gelezen.
John has slowly the telegram read
b. Jan heeft [het telegram t_V] langzaam]] gelezen.
John has the telegram slowly read

Nobody has proposed an analysis along these lines (and nobody should; among other things, it faces serious problems in capturing scopal relations between object and adverb; compare Reuland 1990). However, the analysis does demonstrate that an account of pre-head word order freedom can be at odds with the account of Universal 20 given above: it relies on rightward head movement, while the proposed account of Universal 20 crucially requires that head movement be leftward (see (22iii).

I believe that there is a similar basic incompatibility between the account of Universal 20 and the standard analysis of scrambling, according to which the phenomenon is a consequence of movement of the object across the adverbial (I will refer to this movement as 'object shift'). The analysis comes in various flavours. Traditionally, object shift is seen as optional. Thus, the order in (29a) is base-generated, but (29b) is a movement structure (Kerstens 1975, De Haan 1979, and Hoekstra 1984 are early references for Dutch; see also Mahajan 1990, De Hoop 1992). An analysis along these lines is compatible with Chomsky's hierarchy (AdvP > DP > V), as long as this hierarchy is taken to restrict base structures.

(29) a. Jan heeft [langzaam [$_{VP}$ [het telegram] gelezen]]. (optional mvt; OV-base)
John has slowly the telegram read
b. Jan heeft [[het telegram] [langzaam [$_{VP}$ t_{DP} gelezen]]].
John has the telegram slowly read

Various recent movement analyses take object shift to be obligatory. The free word order effect is then captured by allowing the adverb to merge either above or below the landing site of the object. The base position of the object could be to the left of the verb (see Vanden Wyngaerd 1989), or to its right (as required by antisymmetry; see Zwart 1993):

(30) a. Jan heeft [langzaam [[het telegram] [$_{VP}$ t_{DP} gelezen]]. (obligatory mvt; OV-base)
John has slowly the telegram read
b. Jan heeft [[het telegram] [langzaam [$_{VP}$ t_{DP} gelezen]]].
John has the telegram slowly read

(31) a. Jan heeft [langzaam [[het telegram] [$_{VP}$ gelezen t_{DP}]]. (obligatory mvt; VO-base)
John has slowly the telegram read
b. Jan heeft [[het telegram] [langzaam [$_{VP}$ gelezen t_{DP}]]].
John has the telegram slowly read

As before, these analyses are compatible with Chomsky's hierarchy if what counts is the base position of the object. Note that it is fundamental to the analyses in (30) and (31), though, that the landing site of the object is not part of the same hierarchy that mentions adverbs and the object's underlying position. Otherwise, variable placement of adverbials would not be possible. Obligatory-movement analyses of scrambling must therefore reject the hypothesis that there is a single hierarchy that spans the entire verbal extended projection. I return to this point in section 4.

We can evaluate analyses of scrambling on the basis of the three criteria in (32).

(32) (i) Do they explain why all OV-languages have scrambling?
(ii) Do they explain why VO-languages show case adjacency effects?
(iii) Are they U20-compatible? (That is, are they in agreement with the assumptions in (22)?)

A few words on U20-compatibility. Any movement analysis of scrambling is in danger of violating the condition in (22iv). Recall that in order to capture Universal 20 it was necessary to restrict movements that derive neutral orders to the noun or constituents containing the noun (under pied-piping). In parallel to this, one would expect neutral orders in the extended verbal projection to be derived by movement of the verb or a constituent containing the verb. But object shift is movement of a dependent of the verb. There is one obvious way out for proponents of a movement analysis of scrambling: if object shift is a marked operation it falls outside the scope of (22iv), which is after all a constraint on neutral word order.

With this in mind, let us consider the three movement analyses in more detail. The analysis in (29) (optional movement from an OV-base) is well placed to meet the requirement of U20 compatibility. As object shift is taken to be an optional movement, one would expect it to be triggered by some discourse-related feature, which would make it a marked operation. Indeed, the literature contains various attempts at identifying a possible trigger for object shift, and many of these capitalize on possible interpretive effects associated with this operation (see Diesing 1992 and de Hoop 1992, among others).

Of course, the fact that scrambled orders *can* be marked does not imply that they *must* be. There are a few circumstances in which scrambling is obligatory. For example, objects must appear to the left of depictives that they are associated with, presumably because of the c-command condition on secondary predication (see Williams 1980). DPs that are scrambled obligatorily do not seem to have any of the interpretive properties expected for elements that undergo marked operations. Thus, the DP below is not contrastive, given, specific, generic or partitive, and it has not moved to mark scope (see Ruys 2001 for more detailed discussion and similar examples).

(33) Wat is er aan de hand?
'What's going on?'
a. Ik geloof dat elke voetballer een paar bitterballen te heet gegeten heeft
I believe that every soccer-player a few croquettes too hot eaten has
(en nu is er niemand beschikbaar voor het interview).
(*and now is there no-one available for the interview*)
'I believe that every soccer-player has eaten a few croquettes too hot
(and now no-one is available for the interview).'
b. *Ik geloof dat elke voetballer te heet een paar bitterballen gegeten heeft
I believe that every soccer-player too hot a few croquettes eaten has
(en nu is er niemand beschikbaar voor een interview).
(*and now is there no-one available for the interview*)

Although cases like (33) require work, one can have some hope that the optional movement analysis will meet the criterion of U20 compatibility.

It fares less well on the criteria in (32i) and (32ii). It fails to establish a link between OV-order and scrambling, simply because there is nothing in the logic of the proposal that leads us to expect that the marked operation it relies on should be available in all OV-languages. After all, other marked operations do not have such a general cross-linguistic distribution (for example, there is no correlate in Germanic of the topic and focus movements described by

Kiss (1998) and others for Hungarian). Indeed, the availability or otherwise of specific instances of movement is widely regarded to be a source of parametric variation.

The proposal also fails to capture the link between VO-order and lack of scrambling. As already pointed out by Weerman (1989), there is nothing in the proposal that explains why VO-languages should lack a rightward version of object shift. (Recall that (22iii) only bans rightward head movement; rightward phrasal movement is permitted and is likely to be the correct analysis for heavy-NP shift; see Nissenbaum 2001).

In sum, the analysis in (29) meets the criterion in (32iii), but not those in (32i) and (32ii).

The analysis in (30) (obligatory movement from an OV-base) does not meet any of the three criteria. Like the analysis in (29), it fails to link head-finality and scrambling - there is no reason why all OV-languages should have obligatory object shift. Similarly, it fails to link VO-order and lack of scrambling – there is no reason why VO-languages should not have obligatory object shift to the right. Finally, it is not U20-compatible, because object shift, being an obligatory movement, must derive neutral orders (any markedness effect associated with scrambling must be traced back directly to the position of the object vis-à-vis that of the adverbial). But if object shift derives neutral orders, it violates (22iv), given that the category that moves does not contain the verb.

This problem carries over to the analysis in (31) (obligatory movement from a VO-base). As before, since object shift happens in every clause with a DP-object, it must derive neutral orders, something not allowed by (22iv). In other respects, the analysis in (31) is more successful. It potentially explains the link between OV-order and scrambling, because the same operation that derives OV-order also allows adverbials to intervene between verb and object. Similarly, it potentially explains the link between VO-order and case adjacency, on the assumption that if verb and object remain in situ there is no adverbial position that can separate them (the essence of Chomsky's (1965) hierarchy). These explanations are only potential, because they depend on a worked-out theory of verb placement that is not currently available. Suppose that in OV-languages the object moves to Spec-AgrOP, as proposed by Zwart 1993, then obligatory V-to-AgrO will derive OV-languages without scrambling, as there is no adjunction site for adverbs between Spec-AgrOP and Agro. Similarly, obligatory V-to-AgrO in a VO-language may give rise to a VO-language with scrambling. (This may or may not be problematic depending on whether any of the VO-languages with verb movement can be reanalyzed as V-to-AgrO languages.)

I conclude that existing movement analyses of scrambling are either not U20-compatible, or leave unexplained the link between scrambling and OV/VO order, or both.[6]

4. Multiple Hierarchies[7]

The only wriggle room in dealing with this troublesome state of affairs involves the notion that there is a universal hierarchy AdvP > DP > V (it was this hierarchy that forced an

[6] NP-raising faces a problem similar to object shift: it is a movement of a non-head in neutral sentences. There are two possible solutions. It could be that NP-raising is really not a movement of a DP at all. Another option would be that movements that lead to a change in grammatical function are exempt from (22iv). Thus, given an argumental hierarchy Subject > Indirect Object > Direct Object, NP-raising leads to a change of grammatical function, which in return licenses a neutral position for the derived subject higher in the tree. The difficulty with this analysis is one of implementation: what notion of subject is relevant to the hierarchy? I will have to leave this matter for future research. Note, however, that neither scrambling nor the movements in (16) lead to a change in grammatical function, and therefore the relevant effects of (22iv) stand.

[7] Here and below, I will treat hierarchies as grammatical principles. But of course they should be derived from inherent properties of the elements they mention. This is all the more urgent in view of ordering paradoxes discussed by Nilsen (2003) under the header of 'transitivity failures' (contra the adverbial hierarchy), and the fact that reordering of arguments is permitted in a range of languages (contra the argumental hierarchy). For related discussion, see Svenonius and Ramchand 2014, and references mentioned there.

analysis in which the scrambled order is derived by movement of the DP-object, which in turn led to the difficulties outlined above). The assumptions in (22i,iii,iv) are such that one would expect them to apply beyond the extended nominal projection: there is no reason why the linearization or movement regimes in NP and VP should diverge. The assumption in (22ii), however, is specific to the noun phrase: the existence of a nominal hierarchy does not imply in any way that adverbials must be higher in the tree than internal arguments.

In fact, it has been suggested before – in Bobaljik's (1999) review of Cinque 1999 – that there should not be a single hierarchy comprising of all elements attached in the extended verbal projection. The starting point of Bobaljik's discussion is the argumentation that led Cinque to propose a single hierarchy spanning the entire verbal extended projection. The core observation is that adverbials in Italian come in a fixed hierarchy, while the verb has a variable position. This is illustrated below using the adverbs *mica* 'not' and *più* 'any longer':

(34) a. Non hanno **mica più** mangiato.
NEG have-3PL not any.longer eaten
'They haven't eaten any longer.'
b. Non hanno **mica** mangiato **più**.
NEG have-3PL not eaten any.longer
c. Non hanno mangiato **mica più**.
NEG have-3PL eaten not any.longer

(35) a. *Non hanno **più mica** mangiato.
b. *Non hanno **più** mangiato **mica**.
c. *Non hanno mangiato **più mica**.

The pattern is summarized below:

(36) a. Δ **mica** Δ **più** V
b. Δ **mica** V **più** Δ
c. V **mica** Δ **più** Δ

Cinque's analyses is based on the assumption that adverbs are specifiers generated in a fixed series of designated functional projections that dominate VP. The verb can then move, at least in principle, to any of the functional heads (below, the relevant heads are labelled F5, F6 and F7):

(37) ... F5 [$_{FP6}$ **mica** F6 [$_{FP7}$ **più** F7 [$_{FP8}$ ... V ...

A more complete hierarchy of adverbs is given in (38). Cinque's account neatly explains why it is the case that if a verb cannot appear to the right of some adverb α, it also cannot appear to the right of any adverb lower on this hierarchy than α. Suppose that the verb moves to a position higher than α; then it its landing site is necessarily higher that any adverb lower on the hierarchy than α. If Italian is strictly head-medial (specifier-head-complement), it is inevitable that the ordering constraint just given should hold.

(38) solitamente (usually) > mica (negative) > già (already) > piú (any longer) > sempre (always) > completamente (completely) > tutto (all) > bene

Bobaljik points out that Cinque's proposal faces several problems. The one I would like to highlight here is that, like adverbials, verbal elements in Italian appear in a fixed order

(minimally Aux > V). This is true, no matter where they appear with respect to adverbs. The data below are an illustration of this pattern.

(39) a. Gianni stupidamente mica gli **ha** più **telefonato**.
Gianni stupidly not to-him has any longer telephoned
b. *Gianni stupidamente **telefonato** gli **ha** mica più.
c. *Gianni stupidamente mica **telefonato** gli **ha** più.
d. *Gianni stupidamente **telefonato** mica gli **ha** più.

Hence, the data can be fitted into the scheme in (40) as much as into that in (36). But the scheme in (40) would suggest that it is adverbials rather than verbs that move, revealing a certain degree of arbitrariness in Cinque's core argumentation.

(40) a. Δ **Aux** Δ **V** mica
b. Δ **Aux** mica **V** Δ
c. mica **Aux** Δ **V** Δ

Bobaljik proposes an alternative account in which the variable order of adverbs and verbal heads is not a matter of movement. Rather, adverbials and verbal heads are part of separate hierarchies (Aux > V and the hierarchy in (38)). The two hierarchies are combined like two decks of cards that are being shuffled: the final structure must accord with both hierarchies, but variation in c-command relations between elements on different hierarchies is allowed (modulo language-specific conditions).[8]

The argument just outlined for the ordering of adverbials and verbal elements can be replicated using adverbials and arguments. Bobaljik uses Italian data to demonstrate this, but the crucial pattern can also be observed for Dutch. In this language, adverbials are attached in accordance with the hierarchy proposed by Cinque, while arguments follow the hierarchy Subject > Indirect Object > Direct Object. Arguments and adjuncts can be reordered, as long as both hierarchies are respected. Data illustrating this pattern are given in (41) (which gives the full range of grammatical orders), (42) (which shows the effects of the adverbial hierarchy), and (43) (which shows the effects of the argumental hierarchy).

(41) a. ?Volgens mij hebben toen snel de jongens Marie de boeken gegeven.
according.to me have then quickly the boys Mary the books given
'I think that the boys quickly gave Mary the books at that point.'
b. Volgens mij hebben toen de jongens snel Marie de boeken gegeven.
according.to me have then the boys quickly Mary the books given
c. Volgens mij hebben toen de jongens Marie snel de boeken gegeven.
according.to me have then the boys Mary quickly the books given

[8] Bobaljik argues that his proposal has two advantages: it does not run into problems with the head movement constraint (as it is not necessary to move auxiliary and main verb in tandem), and it does not need to explain why movement preserves the underlying order of auxiliary and main verb (as no movement is required to capture the variable order of verbal elements vis-à-vis adverbials. Cinque (2004) has reacted to these points by suggesting that while the main verb is generated in a fixed position, the auxiliary may be inserted in various functional heads. This avoids the problem with the head movement constraint – in fact, the head movement constraint can be used to explain why the verb cannot move across the auxiliary. However, the proposed flexibility of insertion constitutes an admission that at least some verbal elements are not ordered with respect to adverbials, a point that becomes particularly clear if one considers structures with two auxiliaries/modals: both would have to be allowed to be inserted under various functional heads as long as c-command relations between them are preserved. For further discussion, see footnote 11.

d. Volgens mij hebben toen de jongens Marie de boeken snel gegeven.
according.to me have then the boys Mary the books quickly given
e. Volgens mij hebben de jongens toen snel Marie de boeken gegeven.
according.to me have the boys then quickly Mary the books given
f. Volgens mij hebben de jongens toen Marie snel de boeken gegeven.
according.to me have the boys then Mary quickly the books given
g. Volgens mij hebben de jongens toen Marie de boeken snel gegeven.
according.to me have the boys then Mary the books quickly given
h. Volgens mij hebben de jongens Marie toen snel de boeken gegeven.
according.to me have the boys Mary then quickly the books given
i. Volgens mij hebben de jongens Marie toen de boeken snel gegeven.
according.to me have the boys Mary then the books quickly given
j. Volgens mij hebben de jongens Marie de boeken toen snel gegeven.
according.to me have the boys Mary the books then quickly given

(42) *Volgens mij hebben de jongens Marie de boeken snel toen gegeven.
according.to me have the boys Mary the books quickly then given

(43) a. ??Volgens mij hebben de jongens de boeken Marie gegeven.
according.to me have the boys the books Mary given
b. *Volgens mij hebben Marie de jongens de boeken gegeven.
according.to me have Mary the boys the books given
c. *Volgens mij hebben de boeken de jongens Marie gegeven.
according.to me have the books the boys Mary given
d. *Volgens mij hebben Marie de boeken de jongens gegeven.
according.to me have Mary the books the boys given
e. *Volgens mij hebben de boeken Marie de jongens gegeven.
according.to me have the books Mary the boys given

I briefly explore the consequences of these data for the standard view that there is a single hierarchy spanning all elements in the verbal extended projection, so that the variable placement of arguments with respect to adverbials can only be the result of movement. Notice that this view is incompatible with the theories in (30) and (31), which treat scrambling as an obligatory movement to a fixed preverbal object position, and which therefore must allow adverbials to be generated in multiple positions. It is compatible with the analysis in (29), however: the placement of arguments can be modelled using optional DP movements around fixed adverbial positions (I will refer this generalized version of object shift as 'argument shift'):

(44) a.	Δ	**toen**	Δ	**snel**	DP
b.	Δ	**toen**	DP	**snel**	Δ
c.	DP	**toen**	Δ	**snel**	Δ

As in the case of verb movement, the argument for argument shift suffers from a certain arbitrariness. The Dutch data in (41)-(43) can be modelled equally well using optional movement of adverbials around fixed argument positions:

(45) a.	Δ	**Subject**	Δ	**Object**	toen
b.	Δ	**Subject**	toen	**Object**	Δ
c.	toen	**Subject**	Δ	**Object**	Δ

The proposal further requires a proliferation of functional projections: in order to deal with the examples above, three additional argument positions must be made available c-commanding *snel* 'quickly' and c-commanding *toen* 'then' (in order to accommodate subject, indirect object and direct object). Every additional adverbial potentially requires postulation of a further three argument positions, leading to a vastly expanded tree. This in itself is not a problem, but the task of designing triggers for the many movements required is daunting. If DPs move successive cyclically through the various positions available to them, there may be as many DP-movement triggers as there are adverbials in (38). Isolating these is not a project I would be eager to undertake.

The movement theory faces two further problems. The first is how it can be guaranteed that (in a language like Dutch) the order following movement is identical to the order preceding movement. The second problem is how it is that the various movements required do not interact; that is, why do none of them give rise to relativized minimality violations, given that they will typically cross two intervening DP positions. These two problems are related, because the only solution on the market that deals with the first also deals with the second. Starke (2001) proposes that only full chains count as interveners for relativized minimality (a full chain is a moved category and all its traces). Thus, the structure in (46a) is well-formed, because neither DP_1 nor DP_2 are separated from their traces by a full movement chain. The structure in (46b) is ruled out, however, because DP_1 is separated from its trace by a full chain $\{DP_2\ (t_2)\}$. As will be clear, this proposal favours movement combinations that preserve order, and blocks combinations that invert order. This effect will obtain as long as the movements involved are of the same type, given that relativized minimality is sensitive to movement types.

(46) a. $[DP_1 \ldots [DP_2 \ldots [t_1 \ldots [t_2 \ldots V]]]]$
b. $*[DP_1 \ldots [DP_2 \ldots [(t_2) \ldots [t_1 \ldots V]]]]$

Starke's appeal to chains in the definition of relativized minimality cannot work, however, in view of the existence of so-called nominative-dative inversion. This phenomenon is best described in terms of optional raising-to-subject: in clauses projected from an unaccusative verb that selects two internal arguments, the underlying direct is promoted to subject (as is clear from the fact that it agrees with the verb, a reliable test for subjecthood in Dutch).[9] The promotion of the direct object may or may not be accompanied by overt raising to the subject position, as a comparison of (47) and (48) reveals.

(47) a. Volgens mij zijn toen snel Marie de boeken gegeven.
according.to me are then quickly Mary the books given
'I think the books were given to Mary quickly at that point.'
b. Volgens mij zijn toen Marie snel de boeken gegeven.
according.to me are then Mary quickly the books given
c. Volgens mij zijn toen Marie de boeken snel gegeven.
according.to me are Mary the books then given

(48) a. Volgens mij zijn toen snel de boeken Marie gegeven.
according.to me are then quickly the books Mary given
b. Volgens mij zijn toen de boeken snel Marie gegeven.
according.to me are then the films quickly Mary given

[9] Nominative-dative inversion must be associated with unaccusativity, because transitive verbs do not permit reordering of nominative and dative arguments (as shown in (43)).

c. Volgens mij zijn toen de boeken Marie snel gegeven.
according.to me are then the books Mary quickly given

In order to explain these data, the indirect object must not be an intervener for raising to subject (otherwise, the movement could not invert the original order of arguments). However, in order to explain the data in (41)-(43), the indirect object must be an intervener for argument shift. This means that raising to subject and argument shift must belong to different movement types. However, this is unlikely to be the case. It is now uncontroversial that scrambled arguments occupy A-positions (see Huybregts and Van Riemsdijk 1985; Vanden Wyngaerd 1989; Mahajan 1990 and Neeleman 1994a, among others), which implies that argument shift, like raising to subject, must be an A-movement. One would therefore expect sensitivity to the same class of interveners.

Notice that the two orders of nominative and dative DPs are available irrespective of their placement with respect to adverbials (I demonstrate this for *snel* 'quickly', but the point holds generally). It is unclear whether an analysis based on argument shift can account for this. The only possibility I see would be to say that all movements regulating the order of arguments take place in a very low region of the clause, lower than the lowest adverbial. Any movement from this region to the middle field would then be an instance of order-preserving argument shift. But this would imply that TP is generated below all adverbials, a conclusion that runs counter to evidence that in a range of languages movement of the verb to T can or must cross adverbials (see Emonds 1978 and Pollock 1989, among others).[10]

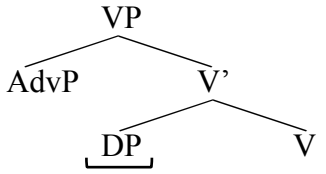
An analysis that breaks up the standard unified hierarchy into separate hierarchies for arguments and adverbials faces none of these problems. The identification of triggers for argument shift is not an issue, as the placement of arguments with respect to adverbials is not a matter of movement. For the same reason, questions regarding order preservation and relativized minimality simply do not arise. Finally, there is no issue regarding the position of TP: both orders of nominative and dative DP can be interleaved with adverbials in the usual way.[11]

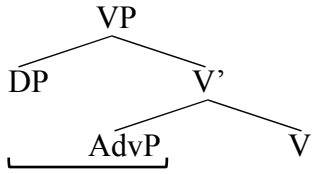
5. Base-Generated Scrambling in OV- and VO-languages

If the argumental and adverbial hierarchies are separated, there is no longer any compelling reason to assume that the object must be generated as a sister of the verb. Of course, the sisterhood condition is a standard assumption, but it is not an assumption that carries the weight of evidence. Its rejection opens the way to a base-generation analysis of scrambling (see Weerman 1989, Van Riemsdijk 1992, Bayer and Kornfilt 1994, Neeleman 1994a and Fanselow 2001, 2003, among others). That is to say, adverbial intervention could simply result from variation in the order of merger (please ignore the horizontal brackets in the trees below; these are there in connection with a proposal discussed later):

[10] At first blush, the idea of separate hierarchies seems to undermine Emonds' argument for verb movement in French. However, I will argue that verb-object adjacency is a property typical of VO-languages. Consequently, the order V-AdvP-O must be generated by movement.

[11] Cinque's (2004) proposal for auxiliaries in reaction to Bobaljik's review (see footnote 8) could in principle be extended to the Dutch data discussed above. It would require that, like auxiliaries, arguments can be base-generated in various functional projections, including projections dominating those that host adverbials. Although this will work, it implies that the hierarchy AdvP > DP > V must be abandoned. This, of course, is exactly the conclusion reached in this section.

(49) a. 

b. 

I assume that selection of internal arguments requires c-command by the argument and m-command by the selecting head ('minimal m-command'). I also assume, in line with a long tradition in generative grammar and beyond, that the case of the object is licensed by the verb.[12] The configuration required for this is again minimal m-command (but see the discussion of case adjacency below). Both conditions are met by the two structures in (49).

This analysis has three immediate advantages. First, it implies that scrambling has A-properties, given that the DP in (49) occupies a theta-position. This is correct: scrambling feeds and bleeds binding and secondary predication, does not give rise to weak crossover effects and is clause-bounded (see Huybregts and Van Riemsdijk 1985, Vanden Wyngaerd 1989, Mahajan 1990 and Neeleman 1994a, among others).[13] Of course, a movement analysis of scrambling can capture the relevant data equally well, as long as the landing site of object shift is classified as an A-position. However, this classification itself does not follow from anything more profound than convenience.

Second, a base-generation analysis of scrambling correctly predicts the absence of evidence for a DP-trace in the DP-AdvP-V order. There is certainly no syntactic or semantic reason to postulate a trace: scrambling does not reconstruct for binding or scope.[14] This is, admittedly, a subtle argument, as A-movement, too, is severely limited in its reconstructive behaviour. However, while there is psycholinguistic evidence for traces left behind by A-movement (see Shetreet and Friedmann 2012, among others), cross-modal priming experiments show that in the case of scrambling there is no reactivation of the object in either preverbal or postverbal position (see Van de Koot et al. 2014). This is of course compatible with the absence of a trace, but poses a challenge for analyses that treat scrambling as the result of movement.

Third, the proposed analysis makes scrambling inevitable. On the assumptions adopted here, parametric variation in word order is the result of linearization or head movement. But scrambling is not either: it is the consequence of variation in the order of merger. If arguments and adverbials are indeed not part of the same hierarchy, it should be possible in all languages to merge the verb with an adverbial before the object is attached. In other words, there cannot be a scrambling parameter: all languages should allow 'early adverbial merger'.

I think that this is consistent with the facts. That early adverbial merger is a universal option is clear when only head-final languages are considered – as discussed above, these consistently allow scrambling. What is less clear is whether early adverbial merger exists in VO-languages. As also discussed, these (often) do not allow the order V-AdvP-DP (recall that exactly this fact persuaded Chomsky (1965) that objects are merged prior to adverbials). I will claim that, like the OV-languages, languages like English allow adverbials to merge before arguments. However, whereas in the OV-languages variation in structure gives rise to

[12] If one treats little *v* as the source of case, the verb must inherit its case licensing properties from this head.

[13] Again, it is crucial to distinguish regular scrambling from A'-scrambling, which is a movement operation triggered (in Dutch) by contrast. A'-scrambling does not affect binding or secondary predication, gives rise to weak crossover effects, is not clause-bounded, and reconstructs (obligatorily) for scope (see Neeleman 1994a and Neeleman and Van de Koot 2008). A distinction between A-scrambling and A'-scrambling has been found to exists in a range of languages, and arguably A'-scrambling, as opposed to A-scrambling, is not tied to head finality (for example, English 'topicalization' shares many properties with A'-scrambling).

[14] A'-scrambling does reconstruct for binding and scope, as expected, given that it is an A'-movement.

variation in order, in English the straight and scrambled structures map onto the same linear order, obscuring the basic fact that English, too, permits early adverbial merger (the proposal is based on earlier work by Van Riemsdijk 1992, Neeleman and Weerman 1999 and Janke and Neeleman 2012).

The hypothesis at the heart of the proposal is a version of case adjacency that has different consequences depending on the linear position of the head. It is given in (50).

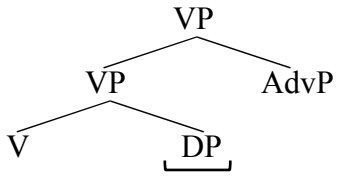
(50) *Case-First Constraint* (a.k.a. Case Adjacency)
   a. The assignment domain of a case-marked DP consists of that DP and any category linearly intervening between it and the verb.
   b. No XP can precede DP in its assignment domain.

This constraint is sensitive to linear order, a controversial issue that I will come back to in section 7. For now, I ask the reader to suspend disbelief.

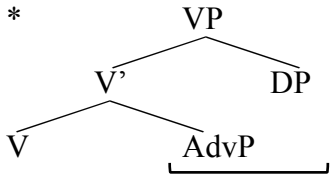
The Case-First Constraint (CFC1; CFC2 will be introduced in section 6) has the consequence that in OV-languages both straight and scrambled structures can surface without problems. In order to see this, consider once more the representations in (49), where the horizontal brackets indicate assignment domains. Recall that I have adopted the traditional assumption that the case of an object is licensed by the verb. Hence, the assignment domain of the case-marked DP in (49a) consists of the DP itself and nothing else, since nothing intervenes between the DP and the verb. As the DP is the only element in its assignment domain, it is also the left-most element, as required. In (49b), the assignment domain of the DP is the string DP-AdvP, because now the adverbial phrase intervenes between the DP and the verb. However, as the DP is leftmost in its assignment domain, CFC1 is satisfied.

The situation is different in VO-languages. The mirror image of (49a), which is given in (51a), is grammatical. The sole element in the DP's assignment domain is the DP itself, which as therefore leftmost. However, the counterpart of (49b) is ruled out. The assignment domain of the DP contains the DP itself and the adverbial (which intervenes between DP and V). In contrast to what CFC1 demands, the adverbial precedes DP in its assignment domain.

(51) a.

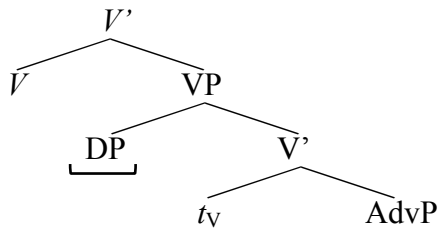


b. *



At first sight, this analysis seems to imply that whereas OV-languages allow two structures, namely (49a) and (49b), VO-languages allow only one, namely (51a). However, Neeleman and Weerman (1999) and Janke and Neeleman (2012) argue that a process of VP-shell formation can rescue structures in danger of violating CFC1. Suppose that the verb indeed merges first with an adverbial and subsequently with a case-marked object. If the object is linearized to the left of its verbal sister, and the verb undergoes short leftward movement across it, the object ends up right-adjacent to the verb, in accordance with CFC1:

(52)



As opposed to verb movements like V-to-I, which are either present or absent in a language (subject to parametrization), VP-shell formation is a last resort operation, subject to the economy condition in (53). It is available in all VO-languages, but only used when need be (that is, when the verb combines with some XP before it combines with a case-marked object).

(53) If two structures are (i) well-formed, (ii) equivalent in interpretation, and (iii) characterised by identical hierarchical relations, except for those created by movement, then choose the one with the fewest movements.

In sum, the proposal is that VO-languages allow early adverbial merger as much as OV-languages, but due to CFC1 the straight structure in (51a) and scrambled structure in (52) end up having the same linear order.

The consequences of CFC1 for English have been worked out in detail in Janke and Neeleman (2012). Here I will review two data sets (and a third in section 6) that support the existence of structures in English in which the verb merges with an adverbial before it merges with the object. The data are not new and many of the conclusions drawn familiar from earlier literature. Yet, their relevance for the analysis of scrambling has been acknowledged only very occasionally (for an exception, see Vanden Wyngaerd 1989).

The first data set has to do with the interpretation of 'quickly'. In the Dutch example in (54a), where the object c-commands this adverbial, a so-called distributive interpretation of the adverb is available: it is true of each of the two books that it was read quickly (though the overall reading event may not have been quick). If the adverbial c-commands the object, as in (54b), this distributive reading disappears. Instead, the adverb receives a collective interpretation: there is a single quick reading event that pertains to both books. It is of course attractive to treat this contrast as a consequence of the difference in the scope of the adverb in the two examples.[15]

(54) a. Jan heeft [die twee boeken [heel snel gelezen]]. (distributive)
John has those two books very quickly read
b. Jan heeft [heel snel [die twee boeken gelezen]] (collective)
John has very quickly those two books read
'John has read those two books very quickly'

The English V-O-AdvP order can express both readings associated with the Dutch examples in (54) (as already pointed out by Phillips 2003). If English did not allow early adverbial merger, this would require an additional interpretive mechanism capable of generating the distributive reading in the absence of the c-command relations required for it in Dutch. If English does allow early adverbial merger, obscured by VP-shell formation, no such complications arise. The distributive interpretation obtains if the object c-commands the adverbial in a VP-shell structure (see (55a)); the collective interpretation obtains if the adverbial c-commands the object in a classical rightward ascending structure (see (55b)).

(55) a. John [$_{V'}$ read [$_{VP}$ [$_{VP}$ those two books [$_{V'}$ t_V very quickly]]]]. (distributive)
b. John [$_{VP}$ [$_{V'}$ read those two books] very quickly]. (collective)

[15] It is expected that (54a) only has a distributive interpretation. However, it is not trivial to exclude a collective interpretation altogether, as the distributive interpretation can entail it: if two books were each read quickly, it is quite likely that the reading of the two books was quick as well.

If this account is on the right track, it should be the case that when one of the structural analyses of *read those two books very quickly* is unavailable, the example looses the associated interpretation. This turns out to be correct.

Standard constituency tests can be used to exclude VP-shell formation: if the verb-object combination behaves as a constituent, the overall structure must be rightward ascending. The prediction, then, is that stranding of the adverbial under VP-fronting and ellipsis will result in a loss of the distributive reading. This is indeed what happens, as observed by Philips (2003). Native speakers report that is it very much harder to access the distributive interpretation in examples like (56) than it is in the baseline example in (55).

(56) a. John wanted to read those two books,
and read those two books he did quickly. (collective)
b. John wanted to read those two books,
and he did so quickly. (collective)
c. John wanted to read those two books,
so he did *e* quickly. (collective)

There is not a standard set of tests that can be used to force VP-shell formation. However, Janke and Neeleman (2012) argue that, in English, object-oriented floating quantifiers are licensed in VP-shell structures only. This is because they must be c-commanded by the associated DP and (as a language-specific fact) precede the category they are attached to. This implies that there is a position in a rightward descending structure in which a floating quantifier can be attached (see (57a)), but no comparable position in a rightward ascending structure: (57b) violates both the c-command restriction and the linearization constraint.[16]

(57) a. $[_{V'}\ V\ [_{VP}$ DP $[_{V'}$ FQ $[_{V'}\ t_V$ AdvP]]]]
b. $[_{VP}\ [_{V'}\ [_{V'}$ V DP] FQ] AdvP]

Consequently, it is expected that the collective interpretation available in (55) will disappear when an object-oriented floating quantifier is inserted. Indeed, native speakers report a clear swing away from the collective interpretation in the example below (the effect may not seem absolute in view of the issue mentioned in footnote 15).

(58) John read those books both very quickly (yesterday). (distributive)

In conclusion, evidence from adverbial interpretation suggests that word order variation in Dutch corresponds to structural variation in English.

This conclusion is strengthened by the distribution of object-oriented depictives in the two languages (a claim that goes back to Vanden Wyngaerd 1989). In Dutch, object-oriented depictives are generated in a position c-commanded by the object, presumably because of the c-command restriction on secondary predication (Williams 1980). In other words, association with a depictive predicate is dependent on scrambling:

(59) a. Jan heeft [de vis [rauw gegeten]].
John has raw the fish raw eaten
b. *Jan heeft [rauw [de vis gegeten]].
John has raw the fish eaten

[16] Notice that floating quantifiers, being left-adjoined, cannot themselves trigger VP-shell formation, but depend on another category to do so.

If secondary predication requires c-command in English as much as it does in Dutch, object-oriented depictives in this language must be merged early. This will subsequently lead to VP-shell formation (as in (60a)), given that the rightward ascending structure in (60b) violates CFC1.

(60) a. John ate [the fish [t_V raw]].
b. *John [[ate raw] the fish].

There is evidence that the structure in (60a) is correct. One way to show this is to compare object- and subject-oriented depictives. There is, of course, no reason why the latter should be attached in a VP-shell structure: they must be c-commanded by the subject, rather than the object. Following Williams 1980, I assume that they are simply merged at VP-level, as in (61).

(61) John [[ate the fish] drunk].

This predicts contrastive behaviour for the two types of depictives. First, it follows that object-oriented depictives must precede subject-oriented depictives (see (62a)). Indeed, while native speakers generally dislike having two depictives in a single clause, (62b) is consistently judged as much better than (62c).

(62) a. [$_{V'}$ V [$_{VP}$ [$_{VP}$ DP [$_{V'}$ t_V AP_{object}]] $AP_{subject}$]]
a. ?John ate the fish raw drunk.
b. *John ate the fish drunk raw.

Second, it is predicted that in principle subject-oriented depictives, but not object-oriented depictives, can be stranded under VP-fronting (see (63)). This is because only the latter are attached outside the constituent containing verb and object. Again, many native speakers reject stranding of depictives to begin with, but those that do allow it judge (63a) as better than (63b).

(63) a. ?John wanted to eat the fish no matter what, and eat the fish he did drunk.
b. *John wanted to eat the fish no matter what, and eat the fish he did raw.

Third, it should be possible for an object-oriented depictive to be preceded by an object-oriented floating quantifier. After all, object-oriented depictives trigger VP-shell formation, which is a necessary condition for insertion of an object-oriented floating quantifier. By contrast, given that subject-oriented depictives are merged in a simple rightward ascending structure, their presence does not create the circumstances that allow insertion of an object-oriented floating quantifier. The data are in line with expectations. It was observed as early as Maling 1976 that examples like (64b) are much better than examples like (64a).

(64) a. *If John ate the fish at all, he ate the fish both drunk.
b. If John ate the fish at all, he ate the fish both raw.

I conclude by listing the claims defended in this section:

i. Scrambling is the result of variation in the order of merger of adverbials and internal arguments. This is possible, because arguments and adverbials are part of different hierarchies.

ii. Early merger of adverbials is a universal possibility, reflected in OV-languages by different surface strings.
iii. However, as a consequence of CFC1, different orders of merger do not give rise different surface strings in English (and by hypothesis in VO-languages in general). Here, early adverbial merger triggers VP-shell formation and hence a surface string identical to the terminal yield of a rightward ascending VP generated through late adverbial merger.

A crucial property of this analysis of scrambling is that it meets the three criteria in (32). It explains why OV-languages have scrambling, as well as why VO-languages show case adjacency effects. The explanation rests on two assumptions: CFC1 and the separation of the hierarchies for arguments and adverbials. It is also compatible with the assumptions in (22) (which form the basis of our understanding of Universal 20). In particular, all relevant structures are either base-generated or derived by leftward head movement. These are exactly the options permitted by (22i,iii,iv). On the proposed account, the only relevant difference between the Universal 20 data and the data considered here is that the nominal modifiers that Greenberg was interested in are part of the same hierarchy, while arguments and adverbials are not.

There is a price to pay for these desirable properties: one has to accept that the syntax is sensitive to linear constraints. I explore the consequences of this later, in section 7, but first I consider whether it is possible to side-step the argument developed in this paper by claiming that nominal and verbal extended projections are simply not subject to the same constraints.

6. A U20 Pattern in VP and an Anti-U20 Pattern in NP

Throughout this paper I have presented it as self-evident that findings regarding the movement regime in the nominal extended projections must carry over to the verbal extended projection. That is, I have assumed that theories of word order in the verbal extended projection must be U20-compatible. But although this may be the null hypothesis, it is not a logical necessity. Proponents of movement theories of scrambling could therefore simply deny that (22iv) holds in the extended verbal projection.

In this section, I aim to block this escape route by showing that there is at least one instance of the U20 pattern in the extended verbal projection and at least one instance of the anti-U20 pattern in the nominal extended projection. If both patterns are found in both domains, it is no longer possible to argue that there is somehow a fundamental difference between noun phrases and verb phrases.

Recall that the U20 pattern is defined in terms of fixed order to the left of the head and variable order to the right. This is exactly what is found in verb-particle constructions when the Germanic OV- and VO-languages are compared: the particle consistently appears adjacent to the verb in OV-languages, but can appear both to the left and the right of the object in VO-languages (with both language-internal and cross-linguistic variation).[17]

(65)

DP Prt V	V Prt DP
*Prt DP V	V DP Prt

U20 pattern

This pattern can be understood if objects must be attached higher in the verbal extended projection than particles. That this is the only possible order of merger follows if particles form a complex predicate with the verb. (A complex predicate is a structural unit that is

[17] The verb-particle constructions is commonplace in Germanic, but rare outside this language family – hence this limitation.

composed of a verb and a non-verbal predicate and that has its own set of selectional requirements, often, but not always, inherited from its constituent parts. The complex-predicate analysis of particles goes back to Chomsky 1955 and has been defended by many, including Groos 1989, Larson 1989, Booij 1990, Hoeksema 1991, Johnson 1991, Roeper and Keyser 1992, Neeleman and Weerman 1993, and Neeleman 1994b). Given that it is the complex predicate as a whole and not just the verb that selects the object, it follows that the object cannot be generated lower in the tree than a particle (as in general arguments cannot be contained within the predicate that selects them). We thus derive a hierarchy O > Prt > V.[18]

The one additional assumption I need to make is that particles project optionally, so that the following structures come into play:

(66) a. $[_V$ Prt V] / $[_V$ V Prt]
b. $[_V$ PrtP V] / $[_V$ V PrtP]

In the OV-languages, the particle will not interfere with the case system, whether it projects or not. As discussed in the previous section, satisfaction of CFC1 is guaranteed in head-final structures even if material intervenes between the object and the verb. Therefore, the hierarchy O > Prt > V results in a rigid surface order with the particle adjacent to the verb (modulo verb second, see Koster 1975). Any deviation from the placement of the particle in the Dutch examples below leads to ungrammaticality. To the best of my knowledge, this pattern repeats itself in other Germanic OV-languages (Afrikaans, Flemish, Frisian, German and their dialects).

(67) a. Jan heeft de informatie op gezocht.
John has the information up looked
b. Jan heeft naar feestje uit gekeken.
John has to the party forward looked
c. Jan heeft Marie het zout door gegeven.
John has Mary the salt on passed.
d. Jan heeft het zout aan Marie door gegeven.
John has the salt to Mary on passed
d'. Jan heeft aan Marie het zout door gegeven.
John has to Mary the salt on passed

The situation is different in the Germanic VO-languages. Notice that CFC1 specifically forbids precedence of XPs in the assignment domain of a case-marked DP, rather than precedence of categories in general (see (50)). This means that in VO-languages it matters whether the particle projects or not. If it does not, all is well; if it does, it will potentially violate CFC1. I will demonstrate below that this goes some ways towards capturing the distribution of particles in English as reported in Den Dikken 1995 and elsewhere (see Neeleman 2002 and Janke and Neeleman 2012 for more detailed discussion). There is further variation across the Scandinavian languages (see Svenonius 1996, Dehé 2012, and references mentioned there), of which I cannot provide an analysis here.

[18] In fact, particles illustrate nicely that hierarchies must ultimately be derived from properties of the elements they mention, rather than stated as linguistic principles. This is because adverbials, too, cannot appear between particle and verb in the OV-languages. Thus, it seems that particles must be mentioned both in the adverbial and the argumental hierarchy, an awkward situation that resolves itself as soon as it is understood that their placement follows if they are treated as constituting a complex predicate with the verb.

There are four cases to consider: a particle verb may select a DP-complement, a PP-complement, two DPs or a DP and a PP.[19] In principle, the particle may or may not project.

(i) If a particle verb selects a DP and the particle does not project, as in (68a), CFC1 is satisfied. If in the same structure the particle were to project, CFC1 would be violated. As before, English responds to this threat by generating a VP-shell (see (68b,c). Notice that the verb in this case may not pied-pipe the particle, as this would result in a violation of CFC1 after movement (see (68d)).

(68) a. John [$_{VP}$ [$_{V}$ looked up$_{Prt}$] the information].
b. *John [$_{VP}$ [$_{V}$ looked up$_{PrtP}$] the information].
c. John [$_{V'}$ looked [$_{VP}$ the information [$_{V}$ t_{V} up$_{PrtP}$]]].
d. *John [$_{VP}$ [$_{V}$ looked up$_{PrtP}$] [$_{VP}$ the information t_{V}]].

As only particles that project can host modifiers and complements, it follows that such extra material is excluded in the V-Prt-DP order, but permitted in the V-DP-Prt order. I illustrate the effect below using the prepositional modifier *right*:

(69) a. *John [$_{VP}$ [$_{V}$ looked [$_{PrtP}$ right up]] the information].
b. John [$_{V'}$ looked [$_{VP}$ the information [$_{V}$ t_{V} [$_{PrtP}$ right up]]]].

(ii) If a particle verb selects a PP, CFC1 does not come into play, given that PPs do not have case-features. This has two implications. First, there is no longer a trigger for VP-shell formation, not even when the particle projects. In the absence of a trigger, verb movement is blocked by the economy condition in (53), so that the particle must surface adjacent to the verb. Second, modification of the particle is unproblematic, even though it appears between the verb and its complement:

(70) a. John [$_{VP}$ [$_{V}$ walked (right) out] on Mary]].
b. *John [$_{V'}$ walked [$_{VP}$ on Mary [$_{V}$ t_{V} (right) out]]].

(iii) In double-object constructions, VP-shell formation is obligatory. This is because in a double-object construction, there are two case-marked DPs, each of which must be leftmost in its assignment domain. The rightward ascending structure in (71a) has only a single assignment domain and therefore violates CFC1. But VP-shell formation, as in (71b) creates two assignment domains, one anchored in the verb and the other in the verb's trace.

(71) a. *[$_{VP}$ [$_{V'}$ V DP] DP]
b. [$_{V'}$ *V* [$_{VP}$ DP [$_{V'}$ t_{V} DP]]]

If a double-object construction is projected from a particle verb, the particle can in principle show up in two positions. All speakers accept that it is stranded by the verb in a position between the two DP-arguments (see (72a)). Alternatively, it could be pied-piped, ending up in a position preceding the two DPs (see (72b)). According to Emonds 1976 and Den Dikken

[19] Space limitations make it impossible to discuss the fact that pronouns, as opposed to full DPs, must precede particles. Capturing this fact requires further assumptions about the licensing of pronouns.

1995, only a minority of speakers accepts this order, indicating that pied-piping is a marked option.[20]

(72) a. John [$_{V'}$ sent [$_{VP}$ the stockholders [$_{V'}$ [$_{V}$ t_{V} off$_{Prt}$] a schedule]]].
b. %John [$_{V'}$ [$_{V}$ sent off$_{Prt}$] [$_{VP}$ the stockholders [$_{V'}$ t_{V} a schedule]]].

It is predicted – correctly – that the particle cannot project in either position without violating CFC1. In (73a) it precedes the direct object in its assignment domain; in (73b) it precedes the indirect object.

(73) a. *John [$_{V'}$ sent [$_{VP}$ the stockholders [$_{V'}$ [$_{V}$ t_{V} [$_{PrtP}$ right off]] a schedule]]].
b. *John [$_{V'}$ [$_{V}$ sent [$_{PrtP}$ right off]] [$_{VP}$ the stockholders [$_{V'}$ t_{V} a schedule]]].

(iii) In the dative construction, the verb selects a DP and a PP. Although I cannot go into details here, there is reason to believe that the order of merger of these elements is variable (compare Dutch (67d,d')). If the DP is merged before the PP, a simple rightward ascending structure is generated (see (74a)), but VP-shell formation is necessary if the DP is merged after the PP (see (74b,c)):

(74) a. [$_{VP}$ [$_{V'}$ V DP] PP]
b. *[$_{VP}$ [$_{V'}$ V PP] DP]
c. [$_{V'}$ *V* [$_{VP}$ DP [$_{V'}$ t_{V} PP]]]

If the verb is accompanied by a particle, four structures are predicted to be grammatical. The particle can surface adjacent to the verb in a simple rightward ascending structure (see (75a)), or appear in the same linear position as a consequence of pied-piping in a rightward descending structure (for those speakers that allow this; see (75b)). Alternatively, the particle can surface between the DP and the PP in a uniformly rightward ascending structure (see (75c)), or in a partly ascending and partly descending structure (see (75d)). In the latter case, formation of a VP-shell formation is not triggered by low merger of the PP, but by projection of the particle.

(75) a. John [$_{VP}$ [$_{V'}$ [$_{V}$ sent off$_{Prt}$] the schedules] to the stockholders].
b. %John [$_{V'}$ [$_{V}$ sent off$_{Prt}$] [$_{VP}$ the schedules [$_{V'}$ t_{V} to the stockholders]]].
c. John [$_{V'}$ sent [$_{VP}$ the schedules [$_{V'}$ [$_{V}$ t_{V} off$_{Prt(P)}$] to the stockholders]]].
d. John [$_{V'}$ sent [$_{VP}$ [$_{V'}$ the schedules [$_{V}$ t_{V} off$_{PrtP}$]] to the stockholders]].

Modification of the particle is predicted to be possible only where it can (or must) project; that is, between the DP and PP arguments:

(76) a. *John [$_{VP}$ [$_{V'}$ [$_{V}$ sent [$_{PrtP}$ right off]] the schedules] to the stockholders].
b. *John [$_{V'}$ [$_{V}$ sent [$_{PrtP}$ right off]] [$_{VP}$ the schedules [$_{V'}$ t_{V} to the stockholders]]].
c. John [$_{V'}$ sent [$_{VP}$ the schedules [$_{V'}$ [$_{V}$ t_{V} [$_{PrtP}$ right off]] to the stockholders]]].

[20] A third option, involving double VP-shell formation, would lead to the particle surfacing in sentence final position (see (i)). However, in this structure the indirect object is no longer contained within the m-command domain of the lowest verbal trace, which I assume implies that it cannot be thematically related to the verb.

(i) *[$_{V'}$ *V* [$_{VP}$ DP [$_{V'}$ t_{V} [$_{VP}$ DP [$_{V'}$ t_{V} PrtP]]]]]

d. John [$_{V'}$ sent [$_{VP}$ [$_{V'}$ the schedules [$_{V}$ t_{V} [$_{PrtP}$ right off]]] to the stockholders]].

In sum, object and particle belong to the same hierarchy, and therefore their distribution in OV- and VO-languages yields a U20 pattern (fixed order preceding the verb, variable order following it). Remarkably, the exact same assumptions that account for the anti-U20 pattern observed with objects and adverbials explain details of particle placement in English.

Conversely, we may expect to find an anti-U20 pattern in the extended nominal projection when two elements merged with the noun are not part of the same hierarchy. Belk and Neeleman (2014) argue that this is the case for APs and PPs. Thus, in head-initial noun phrases, APs must precede PPs and surface adjacent to the noun (in line with Adger 2013), but in head-final noun phrases, APs may precede or follow PPs (contra Adger 2013):

(77)

PP AP N	N AP PP
AP PP N	*N PP AP

Anti-U20 pattern

I illustrate this in (78) and (79) using data from Spanish, Welsh, Japanese and Mandarin, respectively. Note that in all examples except the Welsh one the APs in question are non-predicational, which implies that we must be dealing with direct adjectival modification, rather than reduced relatives (see Cinque 2010). In Welsh, no adjective, whether predicational or not, can follow a PP.

(78) a. un director <?antiguo> de master <*antiguo>
a director <former> of master <former>
'a former director of the master program'

b. y llun <ffug> o'r 15fed ganrif <*ffug>
the picture <fake> from-the 15th century <fake>
'a fake picture from the fifteenth century'

(79) a. <hurui> John-no <hurui> tomodati
<long-time> John-*LNK* *<long-time> friend*
'An old friend of John's'

b. <dangqian de> nongcun li de <dangqian de> wenti
<current LNK> countryside in LNK <current LNK> problem
'the current problem in the countryside'

Belk and Neeleman (2014) propose an analysis of the pattern in (77) based on a constraint parallel to CFC1, which requires that elements in concord with the noun must precede elements that are not. Like CFC1, the Concord-First Constraint is sensitive to linear domains whose definition refers to the head of the structure:[21]

[21] Two clarifications. First, this account relies on a notion of abstract concord, in parallel to abstract case. The analysis presupposes that all APs show concord with the noun, but that concord is not always realized morpho-phonologically.

Second, the formulation of (80) is not completely parallel to (50). This is to accommodate stacking of adjectives. Belk and Neeleman (2014) show that this is not a matter of stipulation. The two constraints can be given a fully parallel formulation; differences between stacking of APs and stacking of DPs can be traced back to inherent differences between case assignment and concord.

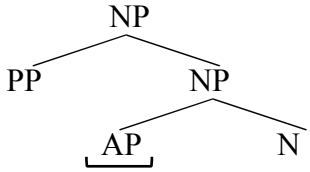
(80) *Concord-First Constraint (CFC2)*

a. The concord domain of an AP carrying a phi-feature set φ consists of that AP and any XP intervening between it and the noun.

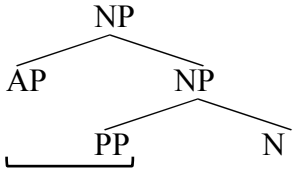
b. No category lacking φ can precede AP in AP's concord domain.

In head-final structures, APs will satisfy CFC2 whether adjacent to the noun or not. In (81a), the AP's concord domain only contains the AP itself, which is therefore leftmost. In (81b) the concord domain contains both AP and PP, but the order these categories come in is as required by CFC2.

(81) a.

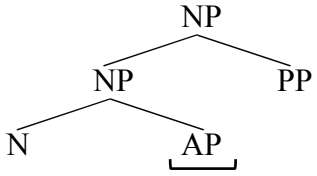


b.

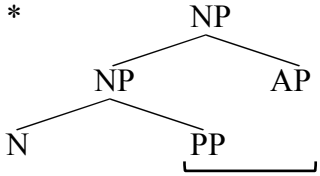


In head-initial structures, the situation is different. The mirror image of (81a) is well formed: the AP in (82a) is the sole element in its concord domain and therefore leftmost. The mirror image of (81b), however, violates CFC2: the PP in (82b) is part of the AP's concord domain, and it precedes it. As in the extended verbal projection, there is a repair mechanism that allows early merger of the PP, namely formation of a NP-shell, as in (82c). Note that in (82c) the AP is again the sole element in its concord domain, which implies CFC2 is satisfied.

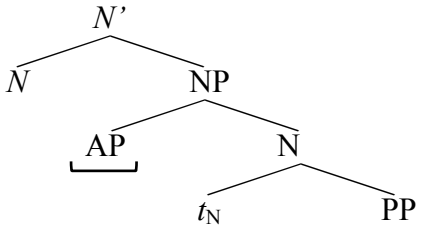
(82) a.



b. *



c.



Thus, as in the case of objects and adverbs, there are two orders of merger. In head-final structures these are mapped onto distinct strings, but in head-initial structures, CFC2 triggers NP-shell formation. This yields the same string as in (82b), but with a different structure.

Some evidence for this structural ambiguity comes from scope (I illustrate this for Spanish, but similar data exist in Welsh). The example is (83) permits two readings: it can refer to a painting that pretends to be from the fifteenth century, or it can refer to a fake painting produced in the fifteenth century. I assume that these two readings correspond to different scopes of the adjective (AP > PP and PP > AP, respectively). That both scopes are available follows from the theory outlined here: the sequence N-AP-PP is structurally ambiguous in exactly the right way (compare (82a) and (82c)).

(83) el cuadro falso del siglo XV
the picture fake of-the century XV
(from the 15th century > fake; fake > from the 15th century)

We would expect that if constituency tests are used to force early merger of the AP, this constituent will no longer be able to take wide scope. This appears to be correct. Reference in (84), for example, can only be to a fake painting produced in the fifteenth century.

(84) el [[cuadro falso]$_1$ del siglo XV] y el e_1 del siglo XVIII
the picture fake of-the century XV and the (one) of-the century XVIII
'the fake picture from the fifteenth century and the one
from the eighteenth century' (from the 15th century > fake)

I conclude that it is a dead end to argue that the nominal and verbal extended projections display different movement regimes. Since U20 and anti-U20 patterns are attested in both domains, the category of the head cannot play a role in the proper account of the issues discussed in this paper. In particular, proponents of movement theories of scrambling are in a very weak position if they claim that (22iv) is limited to the extended nominal projection.

7. Concluding Remarks

This paper can be seen as an attempt to develop a version of head parameter that covers more than simply the linear position of the head. It does so by predicting possible orders of elements attached in the extended projection of the head, depending on whether those elements are part of the same hierarchy and whether any are subject to a precedence constraint. The details are given in the table below.

	single hierarchy	elsewhere	
		precedence condition	elsewhere
head final	[XP [YP h]]	[XP [YP h]] [YP [XP h]]	[XP [YP h]] [YP [XP h]]
head initial	[[h YP] XP] [h [XP [*t* B]]]	[h [XP [*t* YP]]] [[h XP] YP]	[[h YP] XP] [[h XP] YP]
	parametric variation	*language-internal variation*	

Given the movement regime imposed by (22), elements that belong to the same hierarchy will follow the U20 pattern (fixed order preceding the head, variable order following it). The word order variation in this case will predominantly be cross-linguistic, rather than language-internal, as several parameters are involved (governing the ordering of sisters, movement of the head and pied-piping options).

Elements that belong to different hierarchies can universally be merged in different orders. In the elsewhere case, this will simply result in variable order before and after the head, but where a precedence condition exists, an anti-U20 pattern is expected to emerge (variable order before the head, fixed order following it). As no parameters other than the head parameter are involved, the predicted pre-head variation in word order will be language-internal.

A unified account of U20 and anti-U20 orders of the type proposed here is not available to theories of syntax that are antisymmetric. There are, of course, successful antisymmetric theories of Universal 20 (see Cinque 2005) and of the cross-linguistic distribution of scrambling (Zwart 1993), but those theories are mutually incompatible. Cinque's account of Universal 20 assumes that the only movements capable of deriving neutral orders are head movements and movements of categories containing the head. Zwart's account of the cross-linguistic distribution of scrambling crucially relies on an obligatory movement of the object in OV-languages. By their very nature, obligatory movements must derive neutral orders, but

the object neither is nor contains the head of the structure. Thus, to the extent that the asymmetries discussed above are real, they constitute an argument against antisymmetry.

I have relied throughout on principles and parameters that are sensitive to linear order. The most obvious examples are the ban on rightward head movement, the Case-First Constraint and the Concord-First Constraint. There is a long-standing aversion among syntacticians against linear constraints (or 'ugly linear stipulations', as one colleague put it). But an aversion is not the same as a coherent argument. I know of many observations that show that syntactic dependencies are sensitive to structure – denying this would be to deny the facts. However, from a pervasive sensitivity to structure it does not follow that syntax is insensitive to linear order. In fact, worked-out arguments against the relevance of linear order to syntax are thin on the ground.

If it is accepted that there are linear constraints that the syntax is sensitive to, two questions present themselves: where are those constraints located, and why should they hold?

The answer to the first question depends on one's view on other aspects of syntax. If syntax is a derivational system without look-ahead, then linear constraints driving syntactic movement (such as CFC1 and CFC2) must be part of the syntax proper. If the syntax is a representational system or a derivational system with look-ahead, then linear constraints driving syntactic movement could be filters that operate at the PF interface. (Look-ahead in this context need not mean more than 'free movement subject to licensing at the interfaces'). It is often claimed that syntax cannot represent linear order, because rules of interpretation never refer to it. This is not the strongest of arguments (if the observation is correct, it could simply be a property of interpretive rules that they are not sensitive to everything represented in syntax). However, if one were to accept it, it would favor a view of syntax as representational or derivational with look-ahead. Of course, there are several persuasive, but unfashionable arguments in favor of representationalism (see Brody 1995 and subsequent work).

The answer to the why-question is more tentative. One aspect of the language faculty that is uncontroversially sensitive to linear order is the parsing process. Ackema and Neeleman (2002) and Abels and Neeleman (2013) suggest that the ban on rightward head movement might find an explanation in this. If parsing involves immediate structure assignment (see Gorrell 1995) and movement is dealt with using a filler-driven strategy (see Phillips and Wagers 2007), it follows that there is a fundamental difference between leftward and rightward movement: the former involves insertion of a trace while the structure is being built, while the latter involves insertion of a trace in an already built structure. In particular in the case of head movement, this can lead to rather extensive restructuring. A ban on rightward head movement could therefore facilitate the parsing process.

Loes Koring (personal communication) suggests that a similar functional explanation might hold of CFC1 and CFC2. The idea would be that in order for the parser to check the case of an object or the phi-features of an adjective, it must access the morpho-syntactic properties of the head. If the head follows the category in question, this can be done as soon as the head is identified, but if the head precedes, it is necessary to go back in the string to access it. This will be more costly, the further away the head is from the related category. CFC1 and CFC2 of course have the effect that in head-initial structures the distance between head and dependent is minimized, while no such demands are made of head-final structures. If the above is correct, these two constraints could therefore again be seen as designed to facilitate parsing.[22]

[22] There is an obvious affinity between this suggestion and work by Hawkins (2014), who motivates verb-object adjacency on the basis of processing considerations. However, where Hawkins concentrates on the parsing of thematic dependencies, the proposal here refers to morphological features. If linear constraints are located at the

Acknowledgements

This paper is somewhat programmatic, which implies that for some details I must refer the reader to earlier papers that present a fuller account of specific data sets.

There were two sources of inspiration for this paper: Van Riemsdijk 1992, which I read only recently, and a conversation with Guglielmo Cinque about Universal 20. The paper was presented at Villa Salmi in July 2014 during a workshop on the legacy of the Principles and Parameters framework. I would like to thank the participants for useful questions and feedback, and Henk Van Riemsdijk and Riny Huybregts for organizing the event. I received further useful comments from Peter Ackema and Hans van de Koot.

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