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

Ad Neeleman (UCL)

This paper explores two word order asymmetries. The first is the typological pattern known as Universal 20 (see Greenberg 1963). Its core is that the order of modifiers is fixed before the noun, but subject to cross-linguistic variation after it. The second asymmetry is that VO languages typically insist on adjacency of verb and object, while OV languages possibly without exception allow relatively free ordering of adverbial modifiers and internal arguments. These two asymmetries give rise to an analytical anomaly that has thus far gone unnoticed: the assumptions that must be made to capture Universal 20 are incompatible with the assumptions made to account for adverbial intervention. The anomaly can be resolved if the standard understanding of the facts underlying Universal 20 is extended to the verbal domain. But this simple idea is not without consequences. Its implementation requires that some conventional claims about the syntax of objects are abandoned and alternatives put in their place. In particular, following Bobaljik (1999), arguments and adverbials must be assigned to separate hierarchies, and following Stowell (1981), verb-object adjacency must be analyzed in terms of a linear case-based constraint.

## 1. Introduction

Standard phrase structure theory predicts mirror image effects between head-initial and head-final structures whenever there is a fixed order of merger of constituents. Suppose that some head X always combines with YP before it combines with ZP. Suppose, moreover, that there is variation in the linearization of sister nodes, as in (1). Then, pre-head order (ZP-YP-X) will mirror post-head order (X-YP-ZP).

(1) [ <ZP> [ <YP> X <YP> ] <ZP> ]

Thus, whenever c-command relations between categories are fixed, we should expect mirror image effects, either cross-linguistically or language-internally.

Indeed, mirror image effects are plentiful. In English, adverbs may either precede or follow the verb. When they precede, their order 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, already described in Quirk et al. 1985, is exemplified in (2) using time and manner adverbs (in both examples there is a clear preference for the given order of adverbials; here and below, higher indices mark constituents merged after constituents bearing lower indices):

(2) a. Yesterday$_2$ Brian slowly$_1$ walked$_V$ home.
b. Brian walked$_V$ home slowly$_1$ yesterday$_2$.

In Dutch, prepositional phrases can appear either to the left or to the right of the verb. Koster (1974) and Barbiers (1995) observe that in non-root environments the preferred order among postverbal PPs is the reverse of their preverbal order. Neither example in (3) permits change in the order of PPs (unless one or more PPs bear contrastive stress).

(3) a. dat hij [[door een stuurfout]$_3$ [met een knal]$_2$ [op het hek]$_1$ stranddeV].
*that he by a steering-error with a bang on the fence got.stuck*
'that he got stuck on the fence with a bang because he made a steering error'
b. dat hij [stranddeV [op het hek]$_1$ [met een knal]$_2$ [door een stuurfout]$_3$]
*that he got.stuck on the fence with a bang by a steering-error*

The phenomenon is not limited to verbal structures. In Tagalog, adjectives are freely ordered with respect to the noun and show mirror image effects. Thus, reversal of APs in not allowed in either (4a) or (4b):

(4) a. pinakamalapit-na$_2$ pula-ng$_1$ bahay$_N$ (Norvin Richards, p.c.)
*nearest-LNK red-LNK house*
'the nearest red house'
b. bahay$_N$ na-pula$_1$ ng-pinakamalapit$_2$
*house LNK-red LNK-nearest*

Of course, not every language allows constituents to freely precede or follow a given head. In many cases, mirror image effects can 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 (5) is attested. That there is a mirror image effect requires comparison with head-initial structures, such as the English example in (2b).

(5) Brian is gisteren$_2$ langzaam$_1$ naar huis gelopen$_V$.
*Brian is yesterday slowly to home walked*
'Brian has walked home slowly yesterday.'

In view of the above, asymmetries between pre-head and post-head order are unexpected and therefore in need of analysis. I will look at two such two asymmetries in this paper. The first is Greenberg's Universal 20, a typological generalization according to which word order in the noun phrase is fixed to the left of the head, but variable to the right:

(6) 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).

Universal 20 is generally taken to be a statement about neutral word order, that is, word order in the absence of alternations triggered by topic, focus, contrast and various other information-structural or semantic properties that license displacement. In line with much of the literature, I assume that neutral orders are the only orders permitted in out-of-the-blue contexts.

A few quick examples to illustrate (6). 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.

(7) 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'
c. távò ɖàxó xóxó àtɔn éhè lɔ lɛ́ *Gungbe* (Aboh 2004)
*table big old three DEM SPF PL*

I will use the term 'U20 pattern' to refer to data sets of the type in (8) (where the shaded order is unattested/ungrammatical):

(8)

| | |
|---|---|
| ZP YP X | X YP ZP |
| YP ZP X | X ZP YP |

U20 pattern

The second word order asymmetry I will look at instantiates an 'anti-U20 pattern', that is, a situation in which word order to the right of the head is fixed, but word order to the left is variable:

(9)

| | |
|---|---|
| ZP YP X | X YP ZP |
| YP ZP X | X ZP YP |

anti-U20 pattern

This asymmetry involves the position of adverbials with respect to internal arguments (for related discussion, see Corver and Van Riemsdijk 1997, Saito and Fukui 1998, Haider and Rosengren 2003, Hawkins 2008 and Haider 2014).

OV languages in which adverbs precede the verb systematically allow both Adv-O-V order and O-Adv-V order. This alternation can be observed in Afrikaans, Armanian, Assamese, Basque, Bengali, Dutch, Frisian, German, Georgian, Hindi, Japanese, Kannada, Kiowa, Korean, Lezgian, Malayalam, Pashto, Persian, Quechua, Sakha, Tatar, Tsez, Turkish, Uyghur and Uzbek. As far as I am aware, the only OV languages that do not permit adverbial intervention are those that place adverbials in postverbal position (examples are Bambara (Koopman 1992) and Mandingo (Dramé 1983)).

There is considerable variation in VO languages, but typically only V-O-Adv order is permitted when one controls for factors that may independently lead to separation of verb and object. The main complication in ascertaining that VO order correlates with absence of adverbial intervention is that verbs may move leftward, away from the object and across adverbials. I will therefore discuss some of the evidence that supports the connection.

To begin with, in languages with no or limited verb movement, verb-object adjacency can be observed on the surface. I give examples below from English, Bari and Tuki; similar data can be found in Edo, Igbo, Khmer, Maybrat, Thai, Vietnamese, and Xhosa.

(10) a. John read <*slowly> the letter <slowly>.
b. Teleme a kop <*'de'de> kene <'de'de>. *Bari* (Creider 1989)
monkey TNS catch branch quickly
'The monkey caught the branch quickly.'
c. Vakútu vá-mu-será <*ísími> mbasá <ísími>. *Tuki* (Edmond 2013)
women SM-P1-sell rapidly corn rapidly
'The women sell the corn rapidly.'

Other languages display surface effects, but only under specific circumstances. In Icelandic, for example, verb movement needs to be suppressed (by insertion of an auxiliary, which blocks movement of the main verb in this language). This is shown in (11) (comparable observations can be made in Danish, Norwegian and Swedish).

(11) Jón hefur lesið <*rækilega> bækurnar <rækilega>. (Vikner 1994)
*John has read thoroughly the-books thoroughly*
'John has read the books thoroughly.'

Yet other languages show evidence for verb-object adjacency, but only indirectly. In Modern Standard Arabic, for example, the verb always moves, but as adverbials are right-adjoined, there is still a word order effect:

(12) ʃariba ʕamr-un [$t_V$ <*bisurʕatin> al- χamr-a <bisurʕatin>]. (Alazzawie 1990)
*drank ʕamr-NOM quickly the-wine-ACC quickly*
'ʕamr drank the wine quickly.'

A similar but more intricate pattern can be observed in Aghem. As is well known, this language has a focus position that immediately follows the verb (see Hyman 2010 for

discussion and references). I assume, for concreteness' sake, that elements move to the focus position and that the verb moves as well, to a position just above it.[1] Of interest here is the fact that adverbials can only precede the object if narrowly focussed (indicated by boldface in (13)). This can be understood is there is no attachment site for adverbials between the trace of the verb and the object:

(13) a. tí-bvú tì-bìghà mɔ̂ [zì __ [$t_V$ <*né> kí-bɛ́ <né>]]. (Hyman 2010)
*dogs two $P_1$ eat today fufu today*
'the two dogs ate fufu today'

b. tí-bvú tì-bìghà mɔ̂ [zì **né** [$t_V$ kí-bɛ́ $t_{Adv}$]].
*dogs two $P_1$ eat today*
'the two dogs ate fufu **today'**

Similar data can be found in Bemba (Costa and Kula 2008), Makhuwa (Van der Wal 2006) and Zulu (Chen and Downing 2012).

In French and Slovenian, the evidence is even more indirect. As it turns out, adverbs that intervene between verb and object in these languages must display left-to-right scope: reversal of the adverbs (14) results in ungrammaticality. This restriction can be understood if the verb moves leftward and, crucially, there are no adverbial positions between its trace and the object (see Emonds 1978 and Pollock 1989 for related discussion). The pattern extends to Italian (see Cinque 1999), Polish (Natalia Cichosz, p.c.) and Czech (Jiri Kaspar, p.c.).

(14) a. Jean fait [souvent [vite [$t_V$ son travail]]]. *French* (Abeillé and Godard 2003)
John *does often quickly his work*
'John often does his work quickly.'

b. ?Janez je [prebral [ponovno [trikrat [$t_V$ pismo]]]]. *Slovenian* (Nadja Rajgelj, p.c.)
*John has read again thrice letter*
'John has again read the letter three times.' (again > 3 times)

My assessment is that verb-object adjacency is real, although verification is not always straightforward.[2,3]

---

[1] The argument made here does not depend on this assumption; it is, for instance, also compatible with the idea in Cheng and Downing (2012) that the immediately-after-the-verb effect comes about through dislocation of non-focused material (see that paper for details).

[2] While I am not aware of OV languages with preverbal adverbials that ban adverbial intervention, there do seem to be a few counterexamples to verb-object adjacency in VO languages. In Malagasy, adverbs can intervene between verb and object while there is no compelling evidence showing that the verb moves away from the object (for example, adverbs between verb and object come in the reverse scopal order; see Pearson 2007). Norvin Richards (personal communication) suggests that a similar pattern may exist in Tagalog. The availability of these orders can be related to VOS syntax, but it would take me too far afield to discuss this here.

[3] Matthew Dryer (personal communication) has kindly made available the following provisional data regarding the dominant orders of verb, object and manner adverb in his sample:

(i)

| | **VOAdv** | **VAdvO** | AdvVO | **AdvOV** | **OAdvV** | OVAdv | None | Total |
|---|---|---|---|---|---|---|---|---|
| # | 40 | 13 | 1 | 3 | 29 | 2 | 0 | 88 |

Dryer (2013a) gives the numbers in (ii) for attested dominant orders of verb, object and oblique (an oblique is defined as a noun phrase or adpositional phrase that functions as an adverbial modifier of the verb).

(ii)

| | **VOX** | **VXO** | XVO | **XOV** | **OXV** | OVX | None | Total |
|---|---|---|---|---|---|---|---|---|
| # | **210** | **0** | 3 | **48** | **27** | 45 | 167 | 500 |

In both cases, verb-object separation is more common in OV languages than it is in VO languages (29 vs. 13 and 27 vs. 0; 56 vs. 13 overall). However, beyond this general trend, it is not possible yet to draw firm conclusions from these data. Dominant orders are defined in terms of frequency: they are either the only

Adverbial intervention is usually discussed under the heading of 'scrambling' (a general term for free word order effects). However, scrambling is not a unitary phenomenon. Certain instances of scrambling involve A'-movement (typically triggered by notions like topic, focus and contrast), while other instances are A-related and often associated with givenness. I have the impression that the latter are governed by an implicational hierarchy: if a language permits A-scrambling across subjects, it permits A-scrambling across objects; and if a language permits A-scrambling across objects, it permits A-scrambling across adverbials. It is this last, minimal, type of A-scrambling that I am interested in and that I refer to as 'adverbial intervention'. Other types of scrambling fall outside the scope of the paper.[4]

The cross-linguistic distribution of adverbial intervention is not the only phenomenon that presents an anti-U20 pattern. Belk and Neeleman 2015 argue that attributive adjectives can be separated from the noun if prenominal, but not if postnominal (except as a consequence of noun movement). I illustrate the effect below using data from Japanese and Welsh. At the very least, the pattern extends to Finnish, Hungarian, Korean and Mandarin, and to Arabic, other Celtic languages, Hawaiian, Malay and Romance (see Giurgea 2009 and Adger 2013 for related discussion).

(15) a. <hurui> John-no <hurui> tomodati *Japanese* (Tsujioka 2002)
*<long-time>* John-*LNK* *<long-time> friend*
'An old friend of John's'

b. y llun <ffug> o'r 15fed ganrif <*ffug> *Welsh* (David Willis, p.c.)
*the picture <fake> from-the 15th century <fake>*
'a fake picture from the fifteenth century'

However, as more is known about the contrast between OV and VO languages regarding adverbial intervention, I will concentrate on this issue in what follows.

Is it reasonable to demand that Universal 20 and the cross-linguistic distribution of adverbial intervention be considered together? After all, Universal 20 describes cross-linguistic word order variation, while adverbial intervention is word order variation within a single language. Moreover, Universal 20 describes surface orders, while the ban on adverbial intervention in VO languages is not surface-true. However, an explanation for U20 effects may well undermine an account of anti-U20 effects, and vice versa. As I will show, the analysis of Universal 20 requires the absence of a class of movements in the noun phrase crucially used in the verb phrase to deal with adverbial intervention.

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 adverbial intervention, 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 adverbial intervention that makes it possible to explain the link between OV order and adverbial intervention and that is fully

---

available order or the most frequent order. This means that further research is necessary to determine (i) whether the dominant orders listed are also neutral orders and (ii) what alternative orders may exist. As both questions are crucial for the bearing of the data in (i) and (ii) on the hypotheses advanced here, I will need to look in more detail at the languages in Dryer's sample.

[4] It is not clear to me whether these other types of scrambling are associated with the OV/VO parameter. So-called topicalization in English, for example, shares many properties with A'-scrambling, while A-scrambling across objects in German and inversion of direct and indirect object in Icelandic may also be similar in some of their syntax and interpretative effects.

compatible with the account of Universal 20 given earlier (in section 2). Section 6 contains some speculations and conclusions.

## 2. Universal 20

In this section, I discuss Universal 20, and in particular the empirical findings in Cinque's (2005) seminal paper on the topic. I will not be able to discuss Cinque's account in any detail (see Abels and Neeleman 2009, 2012), but will briefly review it in section 6.

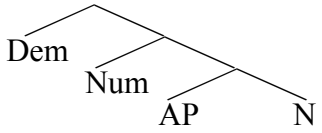
The data in (7) are summarized in the following table, where the shaded order is unattested (and presumed to be ungrammatical).

(16)

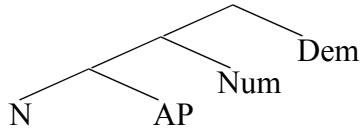
| | |
|---|---|
| Dem Num AP N | N AP Num Dem |
| AP Num Dem N | N Dem Num AP |

A simple account of this limited set of observations is available if one is willing to accept a linear constraint on movement (see Ackema and Neeleman 2002; for an earlier antisymmetric analysis, 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 (16) can then be base-generated (on the assumption 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 (the trees in this section are underspecified in various ways for reasons discussed later):

(17) a.

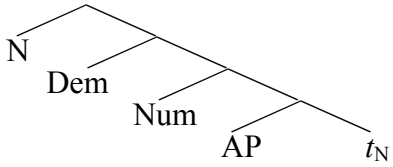



b.

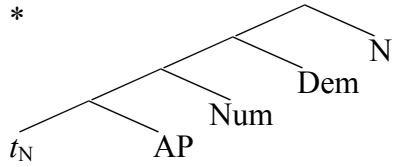



The two remaining orders cannot be base-generated (because N is not adjacent to AP). The first can be derived from (17a) by leftward movement of N (see (18a)). The second would require rightward movement of N, with (17b) as the underlying structure (see (18b)).

(18) a.



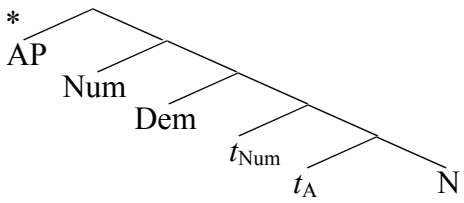

b. *




Therefore, the pattern in (16) follows if we assume that N can only move leftward. In other words, while phrase structure is symmetrical, the gap in this small sample of orders reveals that certain types of movement may be asymmetric.

This is not quite enough. The unattested order AP-Num-Dem-N could also be derived from (17a) by leftward movement of AP and Num (as in (19)). It probably will not do to rule out these operations altogether. Recall, however, that Universal 20 is a generalization about neutral word order. It therefore suffices to assume that phrasal movement cannot be used to derive neutral orders. This would still allow modifiers to move if contrastively focused, for instance.

(19) *




The assumptions that make up the analysis are repeated below:

(20) (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. (*to be revised*)
(iv) Neutral orders are base-generated or derived by $X^0$-movement. (*to be revised*)

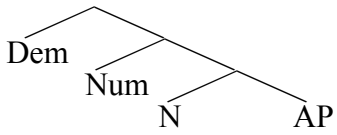
Of course, given that we considering four elements, there are twenty-four logically possible orders that must be considered. The question thus presents itself whether the account given above scales up to reality. Abels and Neeleman (2009, 2012) argue that it does.

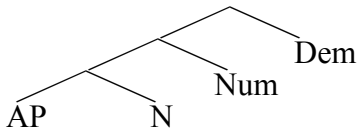
Cinque (2005) provides a careful assessment of the available typological evidence, arguing that only fourteen of the twenty-four logically possible orders of demonstrative numeral, adjective and noun are attested as the neutral order of one or more languages. His findings are summarized in the following table, with unattested orders shaded as before.[5]

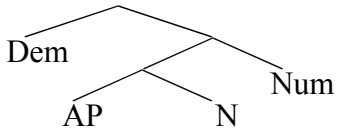
(21)

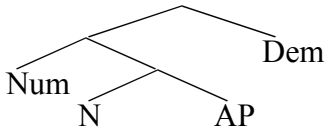
| | I | II | III | IV |
|---|---|---|---|---|
| a. | Dem Num AP N | N AP Num Dem | Dem N Num AP | AP Num N Dem |
| b. | Dem Num N AP | AP N Num Dem | N Dem Num AP | AP Num Dem N |
| c. | Dem AP N Num | Num N AP Dem | AP N Dem Num | Num Dem N AP |
| d. | Dem N AP Num | Num AP N Dem | N Num AP Dem | Dem 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 |

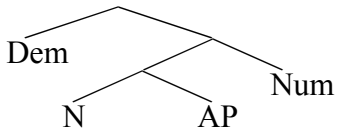
In addition to the structures in (17), three other symmetric pairs can be generated without movement, given in (22a,b), (22c,d) and (22e,f). These correspond to the attested orders in (21Ib,IIb), (21Ic,IIc) and (21Id,IId), respectively. None of the remaining order can be base-generated.

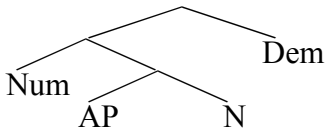
(22) a.



b.


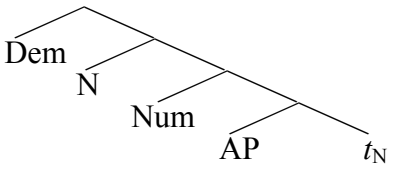

c.


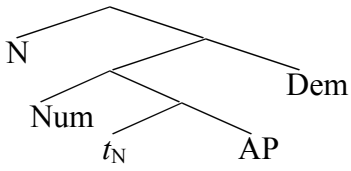

d.



e.



f.


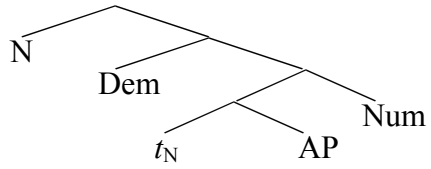

In addition to (18a), three more grammatical structures can be generated by leftward movement of N, as demonstrated in (23). These correspond to the attested orders in (21IIIa,d,e).

(23) a.



b.


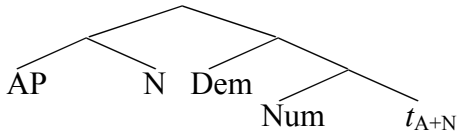

[5] Some of Cinque's findings have been challenged by Dryer (2009/2011). See Cinque (2013) for a detailed reply that confirms the table in (21).

c.

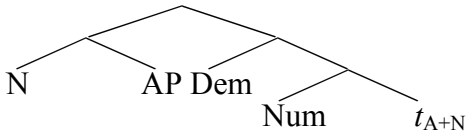



The two remaining attested orders in (21IIIc,f) can also be generated though movement, provided we minimally adjust the rule in (20iii): N-movement must be allowed to pied-pipe other material (in practice AP, but allowing pied-piping of Num and Dem does not lead to additional grammatical orders). The extra structures thus permitted are given in (24).

(24) a.




b.




In sum, all attested orders can be derived on the basis of assumptions in (20), except that $X^0$ in (20iii,iv) should be replaced by $X^+$ in order to signal the need for pied-piping.

(20) (iii) $X^+$-movement is asymmetric: it must be is leftward. (*final version*)
(iv) Neutral orders are base-generated or derived by $X^+$-movement. (*final version*)

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 (21III,IV). This is of course in keeping 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 (21) in a little more detail. Given the hierarchy of merger in (20ii), 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 (25a). Similarly, given that Num must be adjacent to AP+N in any base-generated structure, the order in (25b) is excluded.

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

These restrictions explain why (21Ie,f) and all of (21V) are unattested.

Two unattested orders remain, namely (21IIe,f). In these orders, AP and N are separated, suggesting that N has moved (leftward, as required), pied-piping no material with it (in particular, not pied-piping AP). But this in turn implies that the base structure for both (21IIe) and (21IIf) must have been Num-Dem-AP-N or Num-Dem-N-AP, with Num above Dem, as Num cannot pied-piped by N without AP coming along as well. However, neither of these base structures can be generated under the assumptions in (20) (compare (21IVc,f)).

The trees in this section are highly underspecified. This is intentional. As long as the constraints in (20) are in place, the pattern in (21) is generated, even if no restrictions are imposed on the X-bar theoretical status of modifiers, the range of landing sites for movement or the types of movement involved (see Abels and Neeleman 2012). It seems to me that this underlines the robustness of the analysis. Further confirmation of this robustness comes from the fact that three of the hypotheses in (20) are shared across frameworks. Cinque's (2005) account of Universal 20 is based on Kayne's (1993) Linear Correspondence Axiom, which rules out variation in the linearization of sister nodes. Although Cinque's account is very

different in the derivations it postulates, it relies on assumptions identical or similar to those in (20ii-iv).

◆

What scope does the proposed analysis have? If it were 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 (20i) has been part of phrase structure theory since its inception (see Partee et al. 1990); (20ii) is a particular instance of the widely accepted idea that there are syntactic hierarchies; (20iii) 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 (20iv) is clearly related to the hypothesis that head movement is semantically vacuous (see Chomsky 1995), which may or may not be true in general, but is certainly accurate for the majority of head movements. Therefore, wherever constituents are merged according to a universal hierarchy, we should expect to find U20 patterns (fixed order to the left of the head, variable order to its right).

Evidence that such patterns exist in other domains has been uncovered by Cinque (2009) and Abels (2015). Abels shows that the orders found in Germanic verb clusters form a good match with the table in (21) and can be explained in terms of the assumptions in (20i,iii,iv), combined with the hierarchy of verbal heads. Here, however, I will consider the distribution of PPs in Dutch.

In section 1, I mentioned that Koster (1974) established the existence mirror image effects in the order of preverbal and postverbal PPs in Dutch. In fact, Koster explored this phenomenon not because of its inherent interest, but because of the evidence it provides for verb movement in Dutch main clauses (verb-second). The point is that while in non-root context the order of postverbal PPs is fixed, it is variable in root contexts. This can be understood if the verb moves in root contexts. Following the verb in (26a), only one order of PPs can be generated ($PP_1$-$PP_2$-$PP_3$); following the verb in (26b), multiple orders are admissible ($PP_3$-$PP_2$-$PP_1$, $PP_3$-$PP_1$-$PP_2$, $PP_2$-$PP_1$-$PP_3$, and $PP_1$-$PP_2$-$PP_3$).

(26) a. *that* … [<$PP_3$> [<$PP_2$> [<$PP_1$> V <$PP_1$>] <$PP_2$>] <$PP_3$>]
b. V … [<$PP_3$> [<$PP_2$> [<$PP_1$> $t_V$ <$PP_1$>] <$PP_2$>] <$PP_3$>]

Crucially, two of the six logically possible orders of PPs are predicted to be unacceptable even in root environments. These two orders are $PP_2$-$PP_3$-$PP_1$ and $PP_1$-$PP_3$-$PP_2$. It is easy to see why these should be bad. The verb's base position must be adjacent to $PP_1$. But that means that these orders can only be generated if $PP_3$ is merged before $PP_2$, which is not permitted. The data are as predicted (see Barbiers 1995 for elaborate discussion):

(27) a. *Hij strandde [met een knal]$_2$ [door een stuurfout]$_3$ [op het hek]$_1$.
*he got.stuck with a bang by a steering-error on the fence*
b. *Hij strandde [op het hek]$_1$ [door een stuurfout]$_3$ [met een knal]$_2$.
*he got.stuck on the fence by a steering-error with a bang*

Let me now take a step back and collate the data from root and non-root environments in a single table, looking only at the order of the verb and the three PPs. If we abstract away from the option of PPs moving to the left periphery in root environments, the following pattern emerges:

(28)

| | I | II | III | IV |
|---|---|---|---|---|
| a. | $PP_3$ $PP_2$ $PP_1$ V | V $PP_1$ $PP_2$ $PP_3$ | $PP_3$ V $PP_2$ $PP_1$ | $PP_1$ $PP_2$ V $PP_3$ |
| b. | $PP_3$ $PP_2$ V $PP_1$ | $PP_1$ V $PP_2$ $PP_3$ | V $PP_3$ $PP_2$ $PP_1$ | $PP_1$ $PP_2$ $PP_3$ V |
| c. | $PP_3$ $PP_1$ V $PP_2$ | $PP_2$ V $PP_1$ $PP_3$ | $PP_1$ V $PP_3$ $PP_2$ | $PP_2$ $PP_3$ V $PP_1$ |
| d. | $PP_3$ V $PP_1$ $PP_2$ | $PP_2$ $PP_1$ V $PP_3$ | V $PP_2$ $PP_1$ $PP_3$ | $PP_3$ $PP_1$ $PP_2$ V |
| e. | $PP_1$ $PP_3$ $PP_2$ V | V $PP_2$ $PP_3$ $PP_1$ | V $PP_3$ $PP_1$ $PP_2$ | $PP_2$ $PP_1$ $PP_3$ V |
| f. | $PP_1$ $PP_3$ V $PP_2$ | $PP_2$ V $PP_3$ $PP_1$ | V $PP_1$ $PP_3$ $PP_2$ | $PP_2$ $PP_3$ $PP_1$ V |

This pattern is nearly identical to that in (21) (with $PP_3$ corresponding to Dem, $PP_2$ to Num, $PP_1$ to AP, and N to V). The similarity is highly statistically significant (p=0.00014), suggesting that the two domains must receive a parallel analysis: mirroring around the head and leftward head movement. Crucially, in neutral sentences PPs do not move and the verb does not move rightward. The first point was already tacitly accepted in Koster 1974.[6] As for the second, when Koster wrote his article the idea that Dutch could be an SOV language with rightward V-to-I was not on the agenda yet. However, it was pointed out in Reuland 1990 that data like (28) imply that any such rightward verb movement would have to be strictly string-vacuous. If it crossed any material, preverbal constituents are incorrectly predicted to be able to appear in reverse scopal order, as in [[[$PP_1$ $t_V$] $PP_2$] V].

The fact that three of the shaded cells in (28) have unshaded counterparts in (21) is not an imperfection, but a consequence of two properties of verb-second. (i) Verb-second takes the verb all the way to the left edge of the clause, but (28IIIa) could only be generated through a much shorter movement. (ii) Verb-second does not pied-pipe any material, but (28IIIc) and (28IIId) could only be generated by joint movement of V and $PP_1$.

If the movement regime in (20i,iii,iv) is part of the explanation of Universal 20, as well as the distribution of PPs in the Dutch VP, then one may reasonably expect it to hold quite generally. After all, there is little that unites these two domains beyond the fact that they involve syntax.

## 3. Adverbial intervention through movement

I now turn the fact that OV languages, apparently without exception, allow adverbial intervention, while VO languages require the verb and its object to be adjacent.[7,8]

The standard analysis of verb-object adjacency goes back to Chomsky 1965, where it was assumed that the verb and its internal arguments form a core constituent ('VP') to the exclusion of all adverbials. Adverbials were hosted by a higher-level constituent ('PredP'). Later, Chomsky (1986) proposed the sisterhood condition on θ-assignment, which implies the same hierarchy, AdvP > DP > V. In much subsequent research, this hierarchy was taken to be universal (see, for instance, Baker 1988.). It straightforwardly captures the English pattern, assuming no movement takes place:

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

[6] Koster treats PP extraposition as a transformation restricted in such a way as to yield mirror image effects. However, he does not assume any other transformations that affect PPs.

[7] 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.

[8] 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).

However, Chomsky's hierarchy does not mesh well with the word order freedom found in OV languages. In Dutch, for example, adverbials can be placed between object and verb:

(30) 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*

The OV and VO data constitute an anti-U20 pattern:

(31)

| | |
|---|---|
| AdvP DP V | V DP AdvP |
| DP AdvP V | V AdvP DP |

I realize that adverbial intervention is a language-internal phenomenon, while Universal 20 describes cross-linguistic word order variation. Notwithstanding this contrast, the anti-U20 pattern found with adverbial intervention is at the very least problematic in potential. Consider the following straw man analysis. In English, adverbials can precede or follow the verb. So, in addition to (29a), the structure in (32) exists:

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

Suppose the same is true in Dutch. Then, the word order alternation in (30) could be explained in terms of linearization of the adverb in combination with consistent rightward verb movement across all adverbial positions:

(33) 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; as mentioned before, rightward verb movement is incompatible with observed scopal relations among preverbal constituents; 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 (20iii)).

I believe that there is a similar basic incompatibility between the account of Universal 20 and various popular analyses of adverbial intervention. These analyses treat adverbial intervention as a consequence of movement of the object across the adverbial. I will refer to this movement as 'object shift'. Movement analyses come in various flavors. Traditionally, object shift is seen as optional. Thus, the order in (34a) is base-generated, but (34b) is a movement structure (Kerstens 1975, De Haan 1979, and Hoekstra 1984 are early references for Dutch; see also Mahajan 1990 and 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 only.

(34) 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 more 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. In some accounts, the base position of the object precedes the verb (see Vanden Wyngaerd 1989); in others, it follows it (see Zwart 1993, where this base order is argued to be a consequence of Kayne's (1994) Linear Correspondence Axiom):

(35) 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*

(36) 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.

We can evaluate analyses of adverbial intervention on the basis of the three criteria in (37).

(37) (i) Do they explain why all OV languages have adverbial intervention?
(ii) Do they explain why VO languages show case adjacency effects?
(iii) Are they U20-compatible? (That is, are they in agreement with (20i-iv)?)

A few words on U20-compatibility. Any movement analysis of adverbial intervention is in danger of violating the condition in (20iv). Recall that in order to capture Universal 20 one must accept that neutral orders are base-generated or derived by movement of the noun or constituents containing the noun (under pied-piping). In parallel to this, one would expect that in the extended verbal projection only movements of the verb or a constituent containing the verb could derive neutral orders. But object shift is movement of a dependent of the verb. There is an obvious way out for proponents of a movement analysis of adverbial intervention: if object shift is a marked operation, it falls outside the scope of (20iv), 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 (34) (optional movement from an OV base) is best placed to meet the requirement of U20 compatibility. As object shift is taken to be optional, one would expect it to be triggered by some discourse-related feature, which would then 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 are typically marked does not imply that they *must* be marked. There are circumstances in which adverbial intervention is obligatory. For example, objects must appear to the left of depictives that they are associated with, as well as to the left of adverbials containing an anaphor that they bind. This is obviously a consequence of structural and/or linear conditions on secondary predication (see Williams 1980) and binding. Importantly, obligatorily scrambled objects need not have any of the interpretive properties proposed as typical of elements that undergo marked operations. Thus, the objects in (38) are not topical, focused, contrastive, given, specific, generic or partitive, and they have not moved to mark scope (see Ruys 2001 for related discussion). Moreover, the examples are fine in an out-of-the-blue context.[9]

[9] Object shift does have an interpretive effect in these examples: it allows secondary predication or binding. However, such interpretive effects fall outside the class of semantic and information-structural notions generally

(38) Q: Wat is er aan de hand?
'What's going on?'
A: Het schijnt dat elke voetballer [een paar bitterballen]$_i$ [te heet]$_i$ gegeten heeft
*It seems 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*)
'It seems that every soccer-player has eaten a few croquettes that were too hot
(and now no-one is available for the interview).'
A': Een of andere boef heeft [tien bejaarden]$_i$ vlak na elkaar$_i$ opgelicht
*one or another crook has ten elderly right after each.other swindled*
(en daar is nu een hoop heisa over).
(*and there is now a heap hullabaloo about*).
'Some crook or other has swindled ten elderly people in quick succession
(and that has caused a lot of hullabaloo).'

This is not to say that adverbial intervention is not usually associated with particular interpretive effects. Indeed, scrambled DPs are typically discourse-anaphoric in Dutch. However, the logic of the situation implies that a movement analysis will be in conflict with (20iv) as soon as there is even a single case of a neutral sentence derived by object shift. The optional movement analysis is well placed to meet the criterion of U20 compatibility, but it is not clear that it will actually meet it.

The analysis fares less well with respect to the criteria in (37i) and (37ii). It fails to establish a link between OV order and adverbial intervention, simply because there is nothing in 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 seems to be 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 adverbial intervention. 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 (20iii) only bans rightward head movement; rightward phrasal movement is permitted and is likely to be the correct analysis for heavy-XP shift; see Nissenbaum 2001).[10]

In sum, the analysis in (34) may meet the criterion in (37iii), but it fails to meet those in (37i) and (37ii).

The analysis in (35) (obligatory movement from an OV base) does not meet any of the three criteria. Like the analysis in (34), it fails to link head-finality and adverbial intervention – there is no reason why all OV languages should have obligatory object shift. Similarly, it fails to link VO order and lack of adverbial intervention – there is no reason why VO languages should not have obligatory object shift to the right. Finally, it is not U20-compatible. This is because object shift, being an obligatory movement, must derive neutral

---

taken to identify marked orders. Indeed, secondary predication and binding never block appearance of a sentence in an out-of-the-blue context.

[10] It is sometimes suggested that heavy-XP shift is the VO counterpart of object shift (see Ernst 2001). This does not seem likely to me. (i) Object shift is not subject to a heaviness effect. (ii) Heavy-XP shift may affect categories that cannot be scrambled, such as resultative APs. An example is *She painted the door yesterday as bright green as the one she had seen in Camden*. (iii) Heavy-XP shift reconstructs for variable binding, but object shift does not. Note that binding must be possible in the base order to demonstrate this; a relevant example is *She sent to every boy a photo of the soccer player he most admired*. (iii) OV languages may have heavy-XP shift; see Bury 2003 for discussion and examples from German.

orders. If it was not able to do so, there could not be neutral sentences containing an object. (It follows that any markedness effect associated with adverbial intervention must be traced back directly to the position of the object vis-à-vis the adverbial). But if object shift can derive neutral orders, it violates (20iv).

This problem carries over to the analysis in (36) (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 (20iv). In other respects, the analysis in (36) is more successful. It potentially explains the link between OV order and adverbial intervention, 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 adverbial intervention (as on Zwart's antisymmetrical analysis there can be 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 adverbial intervention as a consequence of a shorter movement than usually assumed (which may or may not be problematic, depending on whether such languages can be identified).

I conclude that existing movement analyses of adverbial intervention are either not U20-compatible, or leave unexplained the link between adverbial intervention and OV/VO order, or both.[11]

## 4. Independent Hierarchies[12]

In the previous two sections, I have argued that the discovery and analysis of Universal 20 requires a reassessment of the syntax of the extended verbal projection. One would expect

[11] Scrambling is not the only phenomenon that runs afoul of the principles underlying Universal 20 when analyzed as involving movement. Raising to subject faces a similar problem: it involves a movement operation that can derive a neutral order and that at the same time targets a category not containing the lexical head of the verbal extended projection. For reasons of space, I cannot deal with this problem in any detail, but it seems to me less serious than the problem of adverbial intervention. This is because already there is a U20-compatible theory of raising to subject.

Suppose that, abstracting away from adverbial intervention, the position of arguments is regulated by an argumental hierarchy subject > indirect object > direct object (see also section 4). Suppose, moreover, that this hierarchy is a consequence of the fact that θ-roles come in a grid with a designated position for the external θ-role. It is the order in this grid – in conjunction with the rules for θ-role assignment – that gives rise to the argumental hierarchy.

Now, Williams (1986, 1994) has argued that NP trace converts an internal θ-role into an external θ-role. That is, it receives an internal θ-role, while at the same time it contributes a θ-role to the grid projected by the verb. This θ-role slots into the position for the external θ-role and is hence assigned to the subject. An analysis of raising to subject in terms of θ-role promotion successfully captures various properties of NP raising (including the fact that it shows more limited reconstructive behavior than A'-movement). Most importantly for my current purposes, however, it reconciles NP raising with the argumental hierarchy and hence with the principles underlying Univeral 20. Note that neither object shift nor the movements in (19) involve promotion to a higher function on the same hierarchy, and therefore these movements continue to violate (20iv).

An implementation of the analysis sketched here that is compatible in detail with the proposals in the main text can be found in Neeleman and Van de Koot 2002, 2010.

[12] 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.

there to be a uniform movement regime across categories, and indeed there is some evidence in support of this (from the distribution of PPs in Dutch). However, of the analyses of adverbial intervention discussed above, only one potentially explains the cross-linguistic distribution of the phenomenon, and that analysis relies on a movement that has no nominal counterpart.

As far as I can see, the only wriggle room in dealing with this troublesome state of affairs involves the notion that there is a universal hierarchy AdvP > DP > V.[13] Recall that it was this hierarchy that forced an analysis in which the scrambled order is derived by movement of the object, which in turn led to the difficulties outlined above. As explained in section 2, one would expect the assumptions in (20i,iii,iv) to be valid beyond the extended nominal projection. The assumption in (20ii), 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 all elements attached in the extended verbal projection. The core of Cinque's monograph is exactly that there is such a hierarchy and that its existence is confirmed by the distribution of adverbs. Cinque develops this hypothesis on the basis of Italian data, but in what follows I will make use of parallel observations in Dutch. To begin with, note that the adverbials *toen* 'then' and *snel* 'quickly' must come in that order (see (39)), but the order of arguments with respect to these adverbials is free (see (40)). (The adverbial hierarchy of courses includes many more items than 'then' and 'quickly', but two adverbs is enough to illustrate the logic of the proposal.)

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

(40) 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*
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*

[13] One could declare object shift exempt from (20iv). This amounts to special pleading unless a rationale is provided. Such a rationale will be hard to find. Recall from section 1 that an anti-U20 pattern is found in the noun phrase with attributive APs (XP ranges over various types of constituents, including PP modifiers):

(i)

| | |
|---|---|
| XP AP N | N AP XP |
| AP XP N | N XP AP |

Hence, movement theory would have to generalize over object shift and the 'AP shift' required to deal with (i) in a way that excludes the movements that must be banned in order to derive Universal 20. I do not see how this can be achieved.

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*

The data can be (partly) summarized as follows:

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

Cinque's proposal has the following ingredients. (i) There is a universal series of functional projections that dominate VP. (ii) Members of each adverbial class are generated in the specifier position of a designated functional projection. (iii) Arguments are generated as the complement of V and in low specifier positions, but they may move to certain unoccupied specifier positions. (iv) Adverbials, however, do not normally move. On these assumptions, the pattern in (41) can be captured if the extended verbal projection contains the partial structure in (42), where the underscored positions are landing sites for argument shift. (Given that all arguments are freely ordered with respect to adverbials in Dutch, there is not only (direct) object shift, but also subject shift and indirect object shift. I will refer to this collection of movements as 'argument shift'.)

(42) ... [$_{FP5}$ __ $F_5$ [$_{FP4}$ **toen** $F_4$ [$_{FP3}$ __ $F_3$ [$_{FP2}$ **snel** $F_2$ [$_{FP1}$ __ $F_1$ [$_{VP}$ ... V ...

Dealing with the alternations in (40) through the scheme in (42) leads to a considerable proliferation of functional projections: three argument positions must be made available between *toen* and *snel* and a further three preceding *toen*. After all, it must be possible to accommodate subject, indirect object and direct object simultaneously above each adverbial. Every additional adverbial class beyond the ones to which *toen* and *snel* belong will necessitate the postulation of three further argument positions. The vast size of the resulting tree is not in itself problematic, but the task of designing triggers for this multitude of movements is daunting. In principle, there may be three times as many triggers for argument shift as there are adverbials classes.

As pointed out by Bobaljik 1999, Cinque's proposal faces several other difficulties. Bobaljik bases his discussion on Italian data, but I will again use comparable Dutch examples. At the heart of matter is the observation that, like adverbials, arguments appear in a fixed order, which follows the hierarchy Subject > Indirect Object > Direct Object:

(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*

Indeed, out of the 120 logically possible orders of *toen*, *snel,* subject, indirect object and direct object, only the ten orders in (40) are grammatical – exactly the orders that adhere to both the adverbial and argumental hierarchies.

This fact reveals a certain arbitrariness in Cinque's argumentation. If the pattern in (41) provides valid motivation for argument shift, then the pattern in (44) should provide equally valid motivation for optional movement of adverbials around fixed argument positions.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| (44) a. | Δ | **Subject** | Δ | **Ind. Obj.** | Δ | **Dir. Obj.** | toen |
| b. | Δ | **Subject** | Δ | **Ind. Obj.** | toen | **Dir. Obj.** | Δ |
| c. | Δ | **Subject** | toen | **Ind. Obj.** | Δ | **Dir. Obj.** | Δ |
| d. | toen | **Subject** | Δ | **Ind. Obj.** | Δ | **Dir. Obj.** | Δ |

An account of (40) based on argument shift must answer two related questions. The first is how it is that the various instances of argument shift do not interact; that is, why does none of them give rise to a relativized minimality violation, given that they will typically cross two intervening DP positions. The second question is how it can be guaranteed that (in a language like Dutch) the order following movement is identical to the order preceding movement.

These questions are related, because any solutions that deals with the second question must also deal with the first. I focus here on a proposal by Starke (2001).[14] Starke argues 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 (45a) is well-formed, because neither $DP_1$ nor $DP_2$ are separated from their traces by a full movement chain. The structure in (45b) 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 allows combinations of movements that preserve order, and blocks combinations that invert order. The effect will obtain as long as the movements involved are of the same type, given that relativized minimality is sensitive to movement types.

(45) 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 version of relativized minimality runs into trouble, however, with so-called nominative-dative inversion. This phenomenon is best described in terms of optional raising-to-subject. In clauses projected from an unaccusative or passive verb that selects two internal arguments, the underlying direct object is assigned nominative case (as is clear from the fact that it agrees with the verb, a reliable test in Dutch).[15] Assignment of nominative case may or may not be accompanied by overt raising to the subject position, as (46) and (47) show.

[14] Chomsky's (1995) notion of equidistance also addresses the lack of movement interactions and it also guarantees preservation of order. However, it does not extend to structures containing three arguments, which is necessary for the Dutch data. There is other relevant work on the question of order preservation. Richards 2001 notion of 'tucking in' leads to order preservation in case multiple movements target specifiers of the same head. However, it is not obvious that all material between C and V is part of a single projection, while preservation of order is found throughout the Dutch middle field. Williams 2003 proposes a principle of Shape Conservation that does not apply to movement, but to pairs of representations in a model of grammar where sentences have representations in a variety of modules. The analysis of scrambling developed over the next few pages is not stated in terms of Williams' theory, but it does follow a very similar line of thought. Fox and Pesetsky 2005 propose a theory of Cyclic Linearization according to which order between two elements established in a phase must be preserved in any subsequent phase. It runs into the same problem as Starke's theory: it cannot explain the combination of order preservation under scrambling and lack of order preservation under raising to subject (I cannot demonstrate the point, but see Nilsen 2005 for related discussion involving Norwegian data.)

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

(46) 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*

(47) 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*
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 (43), the indirect object must be an intervener for argument shift. This means that raising-to-subject and the movements that go under the name of argument shift must be different in type. That seems a problematic outcome to me.

In Dutch and many other languages, scrambled arguments occupy A-positions, which implies that argument shift, like raising-to-subject, must be an A-movement (see section 5 for references). Therefore, in order to allow raising-to-subject to change the order of arguments, one must take a fine-grained view of movement types and acknowledge the existence of multiple types of A-movement. But in order to account for order preservation under argument shift, one must take a course-grained view of movement types. The data in (40), which involve just two adverbial classes, already require six distinct A-movements, and these movements must all be of the same type. I think the burden of proof is on those who wish to argue that there is a coherent theory of movement types that fits this picture. (The data in (46) and (47) may also seem problematic for my own proposal, but see footnote 11 and references mentioned there for an analysis of NP raising, and by implication nominative-dative inversion, that is compatible with the theory developed in this paper.)

Notice that the nominative and dative DPs can come in two orders irrespective of their placement with respect to adverbials (as illustrated in (46) and (47) with *snel* 'quickly'; the point holds generally). If the nominative-dative order is derived by raising to subject, as is commonly assumed, the only way in which an analysis based on argument shift can account for this fact is by saying that raising-to-subject takes place in a region very low in the clause, lower than the lowest adverbial. Subsequent argument shift to higher regions of the clause would then preserve the order thus generated. However, the resulting clause structure is at odds with what seems true of languages like English, namely that the landing site of raising-to-subject c-commands a range of adverbial positions (cf. *John was* [*probably politely asked* $t_{DP}$ *to leave*]). Of course, it is possible to argue that there is a landing site for nonorder-preserving movement very low in the clause, and that raising to subject is in fact order-preserving, but I am not aware of independent evidence for such an account.

These are thorny problems, all of which are avoided if we follow Bobaljik 1999 and abandon the idea that there is a single hierarchy that spans the entire verbal extended projection. Bobaljik instead proposes that the variable order of arguments and adverbs found in Italian (and by extension Dutch) is not a matter of movement. Rather, arguments and adverbs are part of separate hierarchies (Subject > Indirect Object > Direct Object and the adverbial hierarchy proposed by Cinque). 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).

On this view, 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.

Bobaljik's implementation of idea that arguments and adverbs are part of separate hierarchies retains the central role of functional heads. What is shuffled are two hierarchies of functional heads, whose specifiers host arguments and adverbs, respectively. Thus, (40f) and (40g) are represented as below.

(48) a. ... [$_{FP3}$ DP $F_3$ [$_{FPb}$ **toen** $F_b$ [$_{FP2}$ DP $F_2$ [$_{FPa}$ **snel** $F_a$ [$_{FP1}$ DP $F_1$ [$_{VP}$ ... V ...
b. ... [$_{FP3}$ DP $F_3$ [$_{FPb}$ **toen** $F_b$ [$_{FP2}$ DP $F_2$ [$_{FP1}$ DP $F_1$ [$_{FPa}$ **snel** $F_a$ [$_{VP}$ ... V ...

However, the analysis does not demand this implementation. The two hierarchies could also directly refer to the relevant arguments and adverbs, without the intervention of functional heads:

(49) a. ... [$DP_3$ [**toen**$_b$ [$DP_2$ [**snel**$_a$ [$DP_1$ [... V ...
b. ... [$DP_3$ [**toen**$_b$ [$DP_2$ [$DP_1$ [**snel**$_a$ [... V ...

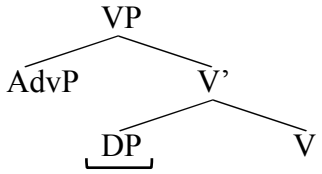
This is what I will assume from now on.

## 5. Adverbial intervention through base-generation

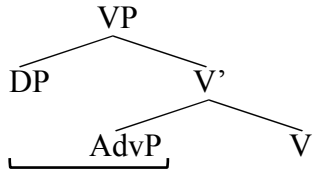
To my mind, the above provides strong evidence for a separation of the argumental and adverbial hierarchies. Once these hierarchies are separated, however, there is no longer a compelling reason why the object should have to start out as sister of the verb. A rejection of the sisterhood condition has consequences for the analysis of both OV and VO languages. I discuss these in turn, starting with the former.

In the absence of the sisterhood condition, a base-generation analysis of adverbial intervention becomes a serious option (see Weerman 1989, Van Riemsdijk 1992, Bayer and Kornfilt 1994, Neeleman 1994a and Fanselow 2001, 2003, among others). Adverbial intervention in OV languages could simply result from variation in the order of merger, as in (50) (please ignore the horizontal brackets in the trees below; these are there in connection with a proposal discussed later).

(50) 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, either to the left (in OV languages) or to the right (in VO languages; see below for a discussion of little *v*). 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 (50).

A base-generation analysis has three advantages. First, it predicts that scrambling across adverbs will have A-properties – after all, the DP in (50) occupies a θ-position. This prediction is certainly correct for Dutch: such scrambling feeds and bleeds binding and

secondary predication and does not give rise to weak crossover effects (for relevant discussion, see Huybregts and Van Riemsdijk 1985, Vanden Wyngaerd 1989, and Neeleman 1994a, among others). However, the conclusion holds more generally. The availability of local A-scrambling has been established for a range of OV languages, including Afrikaans (Louw 2012), Basque (Vincente 2005), German (Fanselow 1990), Georgian (Skopeteas and Fanselow 2010), Hindi (Mahajan 1990), Japanese (Saito 1992), Korean (Lee 1993), Persian (Browning and Karimi 1994), Sakha (Baker and Vinokurova 2010), Tatar (Podobryaev 2013), and Turkish (Öztürk 2005, Georgala 2011).[16] I am not aware of OV languages for which has been shown that adverbial intervention requires A'-movement. The null hypothesis, then, must be that adverbial intervention is uniformly A-related.

Of course, a movement analysis of adverbial intervention can capture the known data equally well, as long as the landing site of object shift is classified as an A-position. However, in a movement analysis this classification itself does not follow from anything more profound than convenience. In the base-generation analysis, it is inevitable.

Second, a base-generation analysis of adverbial intervention 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: adverbial intervention does not reconstruct for binding or scope. This is, admittedly, a subtle argument, as A-movement, too, is severely limited in its reconstructive behaviour. However, while reconstruction of existential quantifiers under raising-to-subject is possible, such quantifiers take surface scope when scrambled. In addition, Van de Koot et al. (2015) present psycholinguistic evidence suggestive of the absence of traces.

Third, a base-generation analysis makes adverbial intervention inevitable. On the assumptions adopted here, parametric variation in word order is the result of linearization or movement. But adverbial intervention is neither: it is a consequence of variation in the order of merger. If arguments and adverbials are indeed part of separate hierarchies, it should be possible in all languages to merge the verb with an adverbial before the object is attached. This, of course, accounts for the consistent presence of adverbial intervention in OV languages.

For VO languages, the consequences of a rejection of the sisterhood condition are far reaching. Verb-object adjacency can no longer have a structural explanation. Instead, it will have to be accounted for in linear terms, as originally suggested by Stowell (1981), who argued that case assignment requires adjacency. In addition, we expect that, like the OV languages, languages like English allow adverbials to be merged before or after internal arguments. I will argue that this prediction is correct. However, whereas in the OV languages variation in structure gives rise to variation in order, in English the straight and scrambled structures map onto the same string as a consequence of case adjacency. This obscures the basic fact that English, too, permits early adverbial merger (what follows is based on earlier work by Neeleman and Weerman 1999, and Janke and Neeleman 2012).

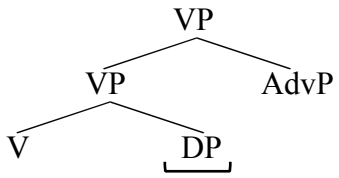
The hypothesis at the heart of the proposal is a version of case adjacency that has different consequences depending on the linear position of the head. It is given in (51).

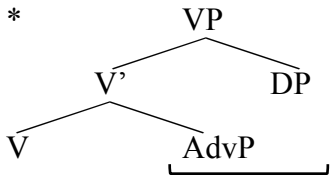
[16] This is true, even though in some of these languages less local scrambling involves A'-movement (see also the short discussion of scrambling in section 1). Turkish and Dutch are examples. Scrambling across the subject in these languages is an A'-movement, licensed by certain topic or focus readings of the moved material, but adverbial intervention still has A-properties (see Neeleman 1994a, and Neeleman and Van de Koot 2008 for Dutch and Georgala 2011 for Turkish).

(51) *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 case-assigning head.
   b. No XP can precede DP in its assignment domain.

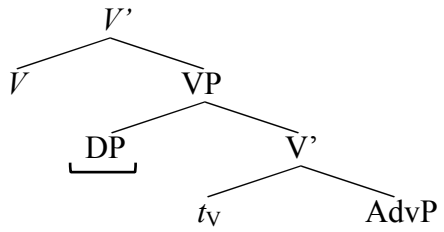
The Case-First Constraint (CFC) has the consequence that in OV languages both straight and scrambled structures can surface without problems. In order to see this, consider once more the representations in (50), where I have used horizontal brackets to indicate assignment domains. Recall that I have 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 (50a) 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 (50b), the assignment domain of the DP is the string DP-AdvP, because the adverbial phrase now intervenes between the DP and the verb. However, as the DP is leftmost in its assignment domain, the CFC is satisfied.

The situation is different in VO languages. The mirror image of (50a), which is given in (52a), is grammatical. The sole element in the DP's assignment domain is the DP itself, which as therefore leftmost. However, the counterpart of (50b) is ruled out. The assignment domain of the DP contains the DP itself and the adverbial. In contrast to what the CFC demands, the adverbial precedes DP in its assignment domain.

(52) a.



b. *



At first sight, this analysis seems to imply that whereas OV languages allow two structures, namely (50a) and (50b), VO languages allow only one, namely (52a).[17] 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 the CFC. 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 the CFC:[18]

(53)



I assume that all movement is subject to the economy condition in (54) (see Grimshaw 1997 and Reinhart 2006). Given that VP-shell formation takes place in order to avoid a violation of the CFC, the process will be blocked unless the verb combines with some XP before it

[17] Low adverbial attachment is compatible with the CFC if the adverb precedes V: [$_{VP}$ [$_{V'}$ AdvP V] DP]. However, there is evidence that low adverbials tend to follow the OV/VO parameter, in that they are typically left-attached in OV languages and typically right-attached in VO languages. (For concreteness' sake, I take low adverbials to be adverbials attached lower than the object.) I do not know whether this constraint holds universally, but it is certainly true for English, my sample VO language here (see also footnote 20).
[18] In this section I treat verb movement as self attachment, but nothing hinges on this.

combines with a case-marked object. Thus, the VP-shell structure in (55a) is ruled out, as there is no DP that violates the CFC if the verb remains in situ (compare (55b)).

(54) 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.

(55) a. [$_{VP}$ *V* [$_{VP}$ AdvP [$_{VP}$ t$_{V}$ DP]]]
b. [$_{VP}$ AdvP [$_{VP}$ V DP]]

It is important to realize that the CFC is not an adjacency condition, but a condition that regulates word order in assignment domains. This allows the verb to move away from the object in VO languages, as long as there is an independent trigger for the movement and case is assigned by its trace. However, word order in an assignment domain anchored in a trace is regulated by the CFC, just like word order in an assignment domain anchored in an overt verb. Consequently, case adjacency effects persist in languages with V-to-I, V-to-C, and other verb movements (as shown in section 1).

In sum, the proposal is that VO languages allow early adverbial merger as much as OV languages, but due to the CFC the straight structure in (52a) and scrambled structure in (53) end up having the same linear order.

◆

The consequences of the CFC for English have been worked out in some detail in Janke and Neeleman (2012). Here I will review two data sets 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 will be familiar from earlier literature, in particular work by Larson (collected in Larson 2014). Yet, the connection with adverbial intervention in the OV languages has been made only very occasionally (for a notable exception, see Vanden Wyngaerd 1989).

The first data set has to do with the interpretation of 'quickly'. In the Dutch example in (56a), 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 (56b), 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.[19]

(56) 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 (56) (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

[19] It is expected that (56a) 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 possible that the reading of the two books qualifies as quick as well.

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 (57a)); the collective interpretation obtains if the adverbial c-commands the object in a classical rightward ascending structure (see (57b)).[20]

(57) 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)

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 Phillips (2003). Native speakers report that is it very much harder to access the distributive interpretation in examples like (58) than it is in the baseline example in (57).

(58) 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. They take as a starting point the hypothesis that floating quantifiers are adverbials (Baltin 1995, Bobaljik 1995, Doetjes 1997, Hoekstra 2013) and show that they are subject to two well-formedness conditions: they must be c-commanded by the associated DP (universal) and they must precede the category they are attached to (specific to English).[21] As a consequence, there is a position in a rightward descending structure in which a floating quantifier can be attached (see (59a)), but no comparable position in a rightward ascending structure: (59b) violates both the c-command restriction and the linearization constraint.

(59) 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 (57) 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 19).

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

[20] In footnote 17, I suggested that low adverbials must be right-attached (that is, follow the verb) in English. This is confirmed by the fact that *John quickly read those two books* only permits a collective reading. Hence the awkwardness of *John quickly read every book he ever read*, as compared to *John read every book he ever read quickly*.

[21] There is, of course, an equally well-established tradition that treats floating quatifiers as nominal modifiers stranded by movement (see Sportiche 1988 and subsequent work).

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 adverbial intervention:

(61) 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*

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 (62a)), given that the rightward ascending structure in (62b) violates CFC.

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

Of course, structures of this type are hardly controversial. The constituency in (62a) was already proposed in Larson 1988 for object-oriented depictives. There is ample evidence in support of it, for instance from a comparison of object- and subject-oriented depictives. There is 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 (63).

(63) 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 (64a)). Indeed, while native speakers generally dislike having two depictives in a single clause, (64b) is consistently judged as much better than (64c).

(64) 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 (65)). 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 (65a) as better than (65b).

(65) 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 (66b) are much better than examples like (66a).

(66) 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 so far:

i. Adverbial intervention 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 CFC, 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.

Reader, if your attention has flagged, please note the crucial pay-off of this analysis of adverbial intervention: it meets the three criteria in (37). It explains why OV languages have adverbial intervention, as well as why VO languages show case adjacency effects. The explanation rests on two assumptions: the CFC and the separation of the hierarchies that govern merger of arguments and adverbials. It is also compatible with the assumptions in (20) (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 (20i,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.

◆

The analysis outlined above is designed to capture the anti-U20 pattern instantiated by adverbial intervention while simultaneously sticking to the movement regime postulated for the noun phrase. This makes a crucial prediction: if in the very same domain a set of constituents can be identified that *are* merged in a fixed order, then we should find a U20 pattern. We have already seen an example of this in the distribution of PPs in Dutch. I will now discuss a second case, which is much more closely related to the data at the heart of this paper. It involves the placement of particles vis-à-vis DP and PP objects.

Objects are attached higher in the verbal extended projection than particles. This follows if particles form a complex predicate with the verb. (A complex predicate is a structural unit that is 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.

As it turns out, objects and particles indeed display a U20 pattern. The particle consistently appears adjacent to the verb in the Germanic OV languages, but can appear both

to the left and the right of the object in the Germanic VO languages (with both language-internal and cross-linguistic variation).[22]

(67)

| DP Prt V | V Prt DP |
|---|---|
| *Prt DP V | V DP Prt |

It can be shown that this pattern, and more detailed subpatterns, fall out straightforwardly from the CFC, if one auxiliary hypothesis is made, namely that particles project optionally.[23] If they do, the following structures come into play:

(68) 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 the CFC 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 OV languages (Afrikaans, Flemish, Frisian, German and their dialects).

(69) 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 the CFC specifically forbids precedence of XPs in the assignment domain of a case-marked DP, rather than precedence of categories in general (see (51)). 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 the CFC. I will demonstrate below that this goes some ways towards capturing the distribution of particles in English (as reported in Emonds 1976 and Den Dikken 1995; see Neeleman 2002 and Janke and Neeleman 2012 for a more detailed version of the account given below). There is further variation across the Scandinavian languages (see Svenonius 1996, Dehé 2012, and references mentioned there), for which I cannot provide an analysis here.

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.[24] In each case, the particle may or may not project.

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

[23] This property of particles can be related to the hypothesis that they form a complex predicate with the verb. Complex heads can contain both heads and phrases, as is clear from the coexistence of compounds like $[_N$ $black_A$ $bird_N]$ and $[_N$ $[_{NP}$ red letter] $day_N]$. By hypothesis, elements like adverbs do not form a complex predicate with the verb, and therefore they must be phrasal.

(i) If a particle verb selects a DP and the particle does not project, as in (70a), the CFC is satisfied. If in the same structure the particle were to project, the CFC would be violated. As before, English responds to this threat by generating a VP-shell (see (70b,c)). Notice that the verb in this case may not pied-pipe the particle, as this would result in a violation of the CFC after movement (see (70d)).

(70) 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 any 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*:

(71) 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, the CFC 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 (54), 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:

(72) 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 (73a) has only a single assignment domain and therefore violates CFC. But VP-shell formation, as in (73b), creates two assignment domains, one anchored in the verb and the other in the verb's trace.

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

If a double-object construction is headed by 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 (74a)). Alternatively, it could be pied-piped, ending up in a position preceding the two DPs (see (74b)). According to Emonds 1976 and Den Dikken 1995, only a minority of speakers accepts this order, possibly indicating that pied-piping is a marked option.[25]

---

[24] 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.

[25] A third option, involving double VP-shell formation, would lead to the particle surfacing in sentence final position (see (i)). Whether this structure is available is unclear. Most particles cannot follow the two objects in a double object construction, but the particle *back* can (as in *I sent John the books back*).

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

(74) 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 the CFC. In (75a) it precedes the direct object in its assignment domain; in (75b) it precedes the indirect object.

(75) 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 (69d,d')). If the DP is merged before the PP, a simple rightward ascending structure is generated (see (76a)), but VP-shell formation is necessary if the DP is merged after the PP (see (76b,c)):

(76) 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 (77a)), 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 (77b)). Alternatively, the particle can surface between the DP and the PP in a uniformly rightward ascending structure (see (77c)), or in a partly ascending and partly descending structure (see (77d)). In the latter case, formation of a VP-shell is not triggered by low merger of the PP, but by projection of the particle.

(77) 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:

(78) 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]]].
d. John [$_{V'}$ sent [$_{VP}$ [$_{V'}$ the schedules [$_{V}$ $t_{V}$ [$_{PrtP}$ right off]]] to the stockholders]].

In sum, objects must c-command particles and therefore the distribution of objects and particles 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.

◆

The proposal developed above is based on the traditional assumption that the verb assigns case to the object. However, much current work assumes that case is assigned by a functional

head, little *v*, which also licenses the external argument (see Chomsky 1995 and Holmberg and Platzack 1995). The attraction of this hypothesis is that it captures Burzio's generalization: absence of an external argument implies absence of little *v*, which in turn implies absence of accusative case and therefore requires raising-to-subject in passives, unaccusatives and raising constructions.

However, there has been a wide-scale reassessment of Burzio's generalization, because of evidence suggesting that the presence of an external argument is neither necessary nor sufficient for the licensing of accusative case. Instead, various other accounts have been developed, based on the idea that when an argument can in principle be assigned either nominative or accusative, nominative is selected (see Woolford 2003 and the introduction to Reuland 2000 for useful overviews of evidence and proposals). This kind of account, if correct, discredits the idea of a strict link between accusative case and the external θ-role, and with it one important argument for the little *v* head as originally conceived. Of course, it is still possible that case is assigned by a functional head that is not thematically active. Following much of the literature, I continue to call such a head little *v*.

The little *v* hypothesis predicts that there should be verbal projection in which a transitive verb selects an object that it cannot license because little *v* is absent. The claim that the verb assigns case predicts the opposite: a combination of verb and object by definition contains the verb, and therefore case should be available. It is hard to find examples of verbal projections so small that case is stripped away. However, Wurmbrand (2001) develops an analysis of long passives in German that may fit the bill. In these structures, the object of an embedded infinitive is raised to the matrix subject position under passivization of the matrix verb:

(79) Der Lastwagen und der Traktor wurden [$_{VP}$ $t_{DP}$ zu reparieren] versucht.
*the truck and the tractor were to repair tried*
'They tried to repair the truck and the tractor.'

Wurmbrand argues that the infinitival complement in (79) lacks a little *v*, so that the object of 'repair' depends for its case on merger of a little *v* higher up in the structure, above the matrix verb 'try'. When 'try' is passivized, however, little *v* is absent there, too, and consequently the object must raise to the matrix clause in order to collect nominative case. The grammaticality of (79), then, seems to bear out the crucial prediction made by the little *v* hypothesis.

Note, however, that Wurmbrand's analysis is based on the assumption that raising is triggered by a lack of case. However, the reassessment of Burzio's generalization mentioned above partly took place because this assumption faces serious difficulties. There are convincing examples of DPs that undergo raising despite the fact that case is available, in practice or in principle, in their base position. (i) Various languages have passive and unaccusative structures in which an object bearing dative, accusative or genitive moves to subject position. Icelandic is perhaps the best-known example (see Zaenen, Maling and Thráinsson 1985). (ii) It is far from obvious that in pseudo-passives the case of the preposition is suppressed. (iii) Some languages allow hyperraising: movement out of a full-fledged finite CP into the matrix subject position. Lubukusu and Lusaamia are examples (see Carstens and Diercks 2013). There can be no doubt that a DP that has undergone hyperraising could, at least in principle, have been assigned case in its base position. (iv) In various languages, unaccusatives can take cognate objects, which typically appear in the accusative (see Jones 1988). In the Dutch example in (80), the verb takes both a cognate object and appears with the auxiliary 'be', a reliable indication of unaccusativity in this language.

(80) Hij is een langzame dood gestorven.
*he is a slow death died*
'he died a slow death'

It seems, then, that the fact that the object raises in (79) does not imply that the infinitive has been stripped of its case-assigning properties. It is therefore possible to maintain that case is assigned by the lexical verb.

This leaves the question of what head licenses the external argument. My proposal has no bearing on this. It is compatible with the hypothesis that the external argument is introduced by a functional head (see Kratzer 1996 and Hale and Keyser 2002), as well as with the hypothesis that all thematic roles originate in the verb (see Reinhart 2002). Which of these proposals fits the data best depends on the validity of the claim, made by Marantz (1984), that the connection between the external argument and the verb is looser than that between the verb and its internal arguments. If this asymmetry is real, severing the external argument from its verb is compatible with theory outlined here. If not, the Reinhartian view would provide the best fit (as opposed to proposals in which all arguments are introduced by functional heads).[26]

## 6. Concluding remarks

A large chunk of this paper was devoted to showing that there is a clash between the assumptions that explain Universal 20 and the assumptions often made to account for adverbial intervention. There are successful theories of Universal 20 (see Cinque 2005 and Abels and Neeleman 2009, 2012) and of the cross-linguistic distribution of adverbial intervention (see Zwart 1993), but those theories are mutually incompatible. Any account of Universal 20 must assume 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 adverbial intervention 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.

I have addressed this anomaly by extending the movement regime underlying Universal 20 to the verbal domain. This is possible if two additional assumptions are made. (i) Following Bobaljik (1999), arguments and adverbials must be assigned to separate hierarchies. (ii) Following Stowell (1981), verb-object adjacency must be analyzed in terms of a linear case-based constraint.

The resulting proposal is a version of head parameter that covers more than simply the linear position of the head. It also predicts 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]]<br>[YP [XP h]] | [XP [YP h]]<br>[YP [XP h]] |
| head initial | [[h YP] XP]<br>[h [XP [*t* YP]]] | [h [XP [*t* YP]]]<br>[[h XP] YP] | [[h YP] XP]<br>[[h XP] YP] |

[26] A fifth function associated with little v in Distributive Morphology is categorization of the category-less root at the bottom of the extended verbal projection (see Harley 1995 and Marantz 1997). However, Harley 2009 explicitly argues that if little *v* is assigned this function it cannot at the same time responsible for introduction of the external θ-role or accusative case.

Given the movement regime in (20), elements that belong to the same hierarchy will follow the U20 pattern (fixed order preceding the head, variable order following it). Elements that belong to different hierarchies allow different orders of merger. In the absence of further constraints, this will yield variable word order before and after the head. However, where a precedence condition like the CFC comes into play, an anti-U20 pattern will emerge (variable order before the head, fixed order following it).

Various components of this system are subject to parametric variation. Languages can fix the order of sister nodes, demand or block movement of the head, and determine whether pied-piping is allowed or disallowed. This means that the U20 pattern may have typological instantiations, as well as language-internal instantiations. By contrast, the null hypothesis is that the order of merger is not subject to parametric variation. If so, anti-U20 patterns are expected to involve language-internal word order variation among pre-head material. That is, one would not expect head-final languages with obligatory adverbial intervention or without adverbial intervention. The same expectation holds of other anti-U20 effects (such as the patterns discussed in Belk and Neeleman 2015; see (15)).

As far as I can tell, the problem that U20 patterns and anti-U20 patterns require incompatible movement regimes has no solution in Cartography (see Schlonsky 2010 for an overview and references) or in the standard antisymmetric framework (Kayne 1994). Cartography assumes that each extended projection is fully characterized by a single functional hierarchy. But if a single hierarchy spans the entire verbal extended projection, then adverbial intervention must be the result of movement (as there can be no reordering without movement). This leads to the problems identified in section 3. Standard antisymmetry assumes that SVO is the universal underlying order.[27] The implication is that SOV order is derived by movement of the object, which again leads to the problems identified in section 3.

◆

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 and the Case-First Constraint. There is a long-standing aversion among syntacticians against linear constraints. But an aversion is not the same as a coherent argument. 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 grammar is insensitive to linear order. In fact, worked-out arguments against the relevance of linear order 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 the CFC) 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 do not refer to it. If so, the CFC must be an interface constraint and the syntax must be

[27] I use the term 'standard antisymmetry' mainly to exclude Hubert Haider's very interesting work on the OV/VO parameter (see Haider 2014). Haider's theory is antisymmetric in that syntactic structures are universally rightward descending. However, it differs from standard antisymmetric theories in that it adheres to (20iv). Unfortunately, it is not clear to me how Haider's framework would handle Universal 20. A full evaluation is therefore not possible at present.

representational or derivational with look-ahead. (Of course, there are persuasive arguments in favor of representationalism; see Koster 1987, 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 the CFC. The idea would be that the parser aims to fill in thematic slots in the verb as soon as possible. Any arguments that precede V (the position in which the lexical verb is first merged) can be used to value thematic slots immediately. Arguments that follow V at any distance, however, lead to a delay in thematic integration. It is therefore advantageous to minimize the distance between verb and object in VO languages (for related discussion, see Hawkins 2014). This is, of course, exactly the effect that the CFC has.

One may wonder why the grammar should opt to accommodate the parser using a constraint on case, rather than a thematic constraint. This may follow from the design of the grammar. If linear constraints are located at the PF interface, it is likely that they can access morphosyntactic features like case, but not thematic information (which, after all, is operative at the LF interface).

◆

In sum, if this paper is on the right track, it suggests a program of word order research that explores (i) the nature and interaction of hierarchies, (ii) the typology of precedence constraints, and (iii) the background for precedence constraints in parsing.

## Acknowledgements

This paper would not have been written but for Van Riemsdijk 1992, which I read only recently, and a conversation with Guglielmo Cinque about Universal 20. Previous versions were presented at a workshop on the legacy of the Principles and Parameters framework held at Villa Salmi in 2014, at the 2015 DGfS meeting in Leipzig, and at the 2015 Budapest Conference on Projection and Representation in Syntactic Theory. I would like to thank the following people for comments, questions and information: Klaus Abels, Peter Ackema, Zoë Belk, Theresa Biberauer, Misi Brody, Guglielmo Cinque, Marcel den Dikken, Mark de Vries, Matthew Dryer, Gisbert Fanselow, Riny Huybregts, Loes Koring, Norvin Richards, Kriszta Szendrői, Hans van de Koot, and Henk van Riemsdijk.

## References

Abeillé, Anne, and Danièle Godard, 2003. French Adverbs without Functional Projections. In Martine Coene, Gretel de Cuyper and Yves d'Hulst (eds.) *Current Studies in Comparative Romance Linguistics* (1–39). Amsterdam: John Benjamins.

Abels, Klaus. (2015). The Fundamental Left-Right Asymmetry in the Germanic Verb Cluster. Ms. UCL.

Abels, Klaus, and Ad Neeleman. (2009). Universal 20 without the LCA. In: José M. Brucart et al. (eds.) *Merging Features: Computation, Interpretation, and Acquisition* (60–79). Oxford: OUP.

Abels, Klaus, and Ad Neeleman. (2012). Linear Asymmetries and the LCA. *Syntax* 15:25–74.
Aboh, Enoch. (2004). *The Morphosyntax of Complement-Head Sequences; Clause Structure and Word Order Patterns in Kwa*. Oxford: OUP.
Ackema, Peter, and Ad Neeleman. (2002). Effects of Short Term Storage in Processing Rightward Movement. In: Sieb Nooteboom et al. (eds.) *Storage and Computation in the Language Faculty* (1–51). Dordrecht: Kluwer.
Adger, David. (2013). *A Syntax of Substance*. Cambridge, MA: MIT Press.
Alazzawie, Abdulkhaliq Karim. (1990). *Adjunction in Arabic; Case and Chain Theory*. PhD dissertation. Simon Fraser University.
Bach, Emmon. (1971). Questions. *Linguistic Inquiry* 2:153–166.
Baker, Mark. (1988). *Incorporation: A Theory of Grammatical Function Changing*. Chicago: University of Chicago Press.
Baker, Mark, and Nadya Vinokurova. (2010). Two Modalities of Case Assignment: Case in Sakha. *Natural Language and Linguistic Theory* 28:593-642.
Baltin, Mark. 1995. Floating Quantifiers, PRO, and Predication. *Linguistic Inquiry* 26: 199-248.
Barbiers, Sjef. (1995). *The Syntax of Interpretation*. PhD dissertation. Leiden University.
Bayer, Josef, and Jaklin Kornfilt. (1994). Against scrambling as an instance of Move-Alpha. In: Norbert Corver and Henk van Riemsdijk (eds.) *Studies on Scrambling: Movement and Non-movement Approaches to Free Word Order Phenomena* (17–60). Berlin: Mouton de Gruyter.
Belk, Zoe, and Ad Neeleman. (2015). AP-Adjacency as a Precedence Constraint. Ms. UCL. To appear in *Linguistic Inquiry*.
Bobaljik, Jonathan. (1995). *Morphosyntax: The Syntax of Verbal Inflection*. PhD dissertation. MIT.
Bobaljik, Jonathan. (1999). Adverbs: The Hierarchy Paradox. *Glot International* 4.9/10.
Booij, Geert. (1990). The Boundary between Morphology and Syntax: Separable Complex Verbs in Dutch. In: Geert Booij and Jaap van Marle (eds.) *Yearbook of Morphology 1990*. Dordrecht: Foris.
Brody, Michael. (1995). *Lexico-Logical Form; A Radically Minimalist Theory*. Cambridge, MA: MIT Press.
Browning, Margaret, and Simin Karimi. (1994). Scrambling to object position in Persian. In Norbert Cover and Henk van Riemsdijk (eds.) *Studies on Scrambling: Movement and Non-movement Approaches to Free Word Order Phenomena* (61–100). Berlin: Mouton de Gruyter.
Bury, Dirk. (2003). *Phrase Structure and Derived Heads*. PhD dissertation. UCL.
Carstens, Vicki, and Michael Diercks. (2013). Parameterizing Case and Activity: Hyper-Raising in Bantu. In: Seda Kan, Claire Moore-Cantwell, Robert Staubs (eds.) *Proceedings of the 40th Annual Meeting of the North East Linguistic Society* (99–118). Amherst: UMass Graduate Linguistic Student Association.
Chomsky, Noam. (1955). *The Logical Structure of Linguistic Theory*. Ms. MIT. Published by Plenum Press, New York, 1975.
Chomsky, Noam. (1965). *Aspects of the Theory of Syntax*. Cambridge, MA: MIT Press.
Chomsky, Noam. (1986). *Barriers*. Cambridge, MA: MIT Press.
Chomsky, Noam. (1995). *The Minimalist Program*. Cambridge, MA: MIT Press.
Cinque, Guglielmo. (1996). The 'Antisymmetric' Programme: Theoretical and Typological Implications. *Journal of Linguistics* 32:447–464.
Cinque, Guglielmo. (1999). *Adverbs and Functional Heads: A Cross-Linguistic Perspective*. Oxford: OUP.
Cinque. Guglielmo. (2004). Issues in Adverbial Syntax. *Lingua* 114:683–710.

Cinque, Guglielmo. (2005). Deriving Greenberg's Universal 20 and Its Exceptions. *Linguistic Inquiry* 36:315–332.
Cinque, Guglielmo. (2009). The Fundamental Left-Right Asymmetry of Natural Languages. In: Sergio Scalise, Elisabetta Magni, and Antonietta Bisetto (eds.) Universals of Language Today (165–184). Dordrecht: Springer.
Cinque, Guglielmo. (2010). *The Syntax of Adjectives: A Comparative Study*. Cambridge, MA: MIT Press.
Cinque, Guglielmo. (2013). On the Movement Account of Greenberg's Universal 20: Refinements and Replies. Ms. University of Venice.
Cheng, Lisa, and Laura Downing. (2012). Against FocusP: Evidence from Durban Zulu. In Ivona Kučerová & Ad Neeleman (eds.) *Contrasts and Positions in Information Structure* (247–266). Cambridge: CUP.
Corver, Norbert, and Henk van Riemsdijk. (1997). *The Position of the Head and the Domain of Scrambling*. In: B. Palek (ed.), *Typology: Prototypes, Item Orderings and Universals* (57–90). Prague: Charles University Press.
Costa. Joao, and Nancy Kula. (2008). Focus at the Interface: Evidence from Romance and Bantu. In: Cecile de Cat and Katherine Demuth (eds.) *The Bantu-Romance Connection: A Comparative Investigation of Verbal Agreement, DPs, and Information Structure* (293–322). Amsterdam: John Benjamins.
Creider, Chet. (1989). *The Syntax of the Nilotic Languages: Themes and Variations*. Berlin: Dietrich Reimer Verlag.
De Haan, Germen. (1979). *Conditions on Rules; The Proper Balance between Syntax and Semantics*. Dordrecht: Foris.
Dehé, Nicole. (2012). Particle verbs in Germanic. Ms. University of Konstanz. To appear in: Peter Müller et al. (eds.), *Word Formation; An International Handbook of the Languages of Europe*. Berlin: De Gruyter.
De Hoop, Helen. (1992). *Case Configuration and Noun Phrase Interpretation*. PhD. Diss. University of Groningen.
Diesing, Molly. (1992). *Indefinites*. Cambridge, MA: MIT Press.
Den Dikken, Marcel. (1995). *Particles*. Oxford: OUP.
Doetjes, Jenny. (1997). *Quantifiers and Selection: On the Distribution of Quantifying Expressions in French, Dutch and English*. PhD dissertation. University of Leiden.
Dramé, Mallafé. (1983). *Aspects of Mandingo Grammar*. PhD dissertation. University of Michigan, Ann Arbor.
Dryer, Matthew S. (2009/2011). On the Order of Demonstrative, Numeral, Adjective, and Noun: An Alternative to Cinque. Handout of a paper presented at *Theoretical Approaches to Disharmonic Word Orders*, Newcastle University, May 30th-June 1st 2009, and at the University of Pavia in June 2011.
Dryer, Matthew S. (with Orin D. Gensler). (2013a). Order of Object, Oblique, and Verb. In: Matthew S. Dryer and Martin Haspelmath (eds.) *The World Atlas of Language Structures Online*. Leipzig: Max Planck Institute for Evolutionary Anthropology. (Available at http://wals.info/chapter/84, Accessed on 2015-02-25.)
Edmond, Biloa. (2013). *The Syntax of Tuki: A Cartographic Perspective*. Amsterdam: John Benjamins.
Emonds, Joseph. (1976). *A Transformational Approach to English Syntax*. New York: Academic Press.
Emonds , Joseph. (1978). The Verbal Complex V'-V in French. *Linguistic Inquiry* 9:49–77.
Ernst, Thomas. (2001). *The Syntax of Adjuncts*. Cambridge: CUP.

Fanselow, Gisbert. (1990). Scrambling as NP-Movement. In: Günther Grewendorf and Wolfgang Sternefeld (eds.) *Scrambling and Barriers* (113-140). Amsterdam: John Benjamins.
Fanselow, Gisbert. (2001). Features, θ-Roles, and Free Constituent Order. *Linguistic Inquiry* 32: 405–438.
Fanselow, Gisbert. (2003). Free Constituent Order; A Minimalist Interface Account. *Folia Linguistica* 37:191–231.
Fox, Danny, and David Pesetsky. (2005). Cyclic Linearization of Syntactic Structure. *Theoretical Linguistics* 31: 1-45.
Georgala, Effi. (2011). Scrambling Verb-Final Languages and the Underlying Order of Objects in Ditransitive Constructions. *University of Pennsylvania Working Papers in Linguistics* 17 (article 13).
Giurgea, Ion. (2009). Adjective Placement and Linearization. In: Jeroen van Craenenbroeck (ed.) *Alternatives to Cartography* (275–323). Berlin: Mouton de Gruyter.
Gorrell, Paul. (1995). *Syntax and Parsing*. Cambridge: CUP.
Greenberg, Joseph H. (1963). Some Universals of Grammar with Particular Reference to the Order of Meaningful Elements. In: Joseph H. Greenberg (ed.) *Universals of Human Language* (73–113). Cambridge, MA: MIT Press.
Grimshaw, Jane. 1997. Projection, Heads, and Optimality. *Linguistic Inquiry* 28: 373–422.
Groos, Anneke. (1989). Particle-Verbs and Adjunction. In: Hans Bennis and Ank van Kemenade (eds.) *Linguistics in the Netherlands 1989.* Dordrecht: Foris.
Haider, Hubert. (2014). *Symmetry Breaking in Syntax*. Cambridge: CUP.
Haider, Hubert, and Inger Rosengren. (2003). Scrambling: Nontriggered Chain Formation in OV Languages. *Journal of Germanic Linguistics* 15:203–267.
Hale, Kenneth, and Samuel Jay Keyser. (2002). *Prolegomenon to a Theory of Argument Structure*. Cambridge, MA: MIT Press.
Harley, Heidi. (1995). *Subjects, Events and Licensing*. PhD dissertation. MIT.
Harley, Heidi. (2009). The Morphology of Nominalizations and the Syntax of vP. In: Monika Rathert and Anastasia Giannadikou (eds.) *Quantification, Definiteness and Nominalization* (320–342). Oxford: OUP.
Hawkins, John. (2008). An Asymmetry between VO and OV Languages; The Ordering of Obliques. In: Greville Corbett and Michael Noonan (eds.) *Case and grammatical Relations: Essays in Honor of Bernard Comrie* (167–190). Amsterdam: John Benjamins.
Hawkins, John. (2014). *Cross-Linguistic Variation and Efficiency*. Oxford: OUP.
Hoeksema, Jack. (1991). Complex Predicates and Liberation in Dutch and English. *Linguistics and Philosophy* 14:661–710.
Hoekstra, Jarich. (2013). Another Quantificational Variability Effect: The Indefinite Pronoun *Neemen* 'No One' as a Floating Quantifier and as a Negative Adverb in Fering-Öömrang (North Frisian). *Lingua* 134:194–209.
Hoekstra, Teun. (1984). *Transitivity. Grammatical Relations in GB-Theory*. Dordrecht: Foris.
Holmberg, Anders, and Christer Platzack. (1995). *The Role of Inflection in Scandinavian Syntax*. Oxford: OUP.
Huybregts, Riny, and Henk van Riemsdijk. (1985). Parasitic gaps and ATB. *Proceedings of the NELS 15* (pp. 168–187). University of Massachusetts, Amherst: GSLA.
Hyman, Larry. (2010). Focus Marking in Aghem; Syntax or Semantics? In: Ines Fiedler and Anne Schwartz (eds.) *The Expression of Information Structure; A Documentation of its Diversity Across Africa* (95-116). Amsterdam: John Benjamins.
Janke, Victoria, and Ad Neeleman. (2012). Ascending and Descending VPs in English. *Linguistic Inquiry* 43:151–190.

Johnson, Kyle. (1991). Object Positions. *Natural Language and Linguistic Theory* 9:577–636.
Jones, Michael Allan (1988). Cognate Objects and the Case-filter. *Journal of Linguistics* 24: 89-110.
Kayne, Richard. (1994). *The Antisymmetry of Syntax*. Cambridge, MA: MIT Press.
Kerstens, Johan. (1975). Over afgeleide structuur en de interpretatie van zinnen. Ms. University of Amsterdam.
Kiss, Katalin. (1998). Identificational Focus versus Information Focus. *Language* 74:245–273.
Koopman, Hilda. (1992). On the Absence of Case Chains in Bambara. *Natural Language and Linguistic Theory* 10:555–594.
Koster, Jan. (1974). Het werkwoord als spiegelcentrum. *Spektator* 3:601–618.
Koster, Jan. (1975). Dutch as an SOV Language.' *Linguistic analysis* 1:111–136.
Koster, Jan. (1987). *Domains and Dynasties; The Radical Autonomy of Syntax*. Dordrecht: Foris.
Kratzer, Angelika (1996). Severing the External Argument from its Verb. In: Johan Rooryck and Laurie Zaring (eds.) *Phrase Structure and the Lexicon* (109–137). Dordrecht: Kluwer. Dordrecht.
Larson, Richard. (1988). On the Double Object Construction. *Linguistic Inquiry* 19:335–391.
Larson, Richard. (1989). Light Predicate Raising. *Lexicon Project Working Paper* #27. MIT.
Larson, Richard. (2014) *On Shell Structure*. New York: Routledge.
Lee, Young-Suk. (1993). Scrambling as Case-Driven Obligatory Movement. PhD dissertation. University of Pennsylvania.
Louw, Frederik (2012). *Scrambling in Afrikaans*. MA Dissertation. University of KwaZulu-Natal, Durban.
Mahajan, Anoop. (1990). *The A/A-bar Distinction and Movement Theory,* PhD Diss. MIT.
Maling, Joan. (1976). Notes on Quantifier-Postposing. *Linguistic Inquiry* 7:708–718.
Marantz, Alec. (1984). *On the Nature of Grammatical Relations*. Cambridge: MIT Press.
Marantz, Alec. (1997). No Escape from Syntax: Don't Try Morphological Analysis in the Privacy of your own Lexicon. *Penn Working Papers in Linguistics* 4:201–225.
Neeleman, Ad. (1994a). Scrambling as a D-Structure Phenomenon. In: Norbert Corver and Henk van Riemsdijk (eds.) *Studies on Scrambling: Movement and Non-movement Approaches to Free Word Order Phenomena* (387–430). Berlin: Mouton de Gruyter.
Neeleman, Ad. (1994b). *Complex Predicates.* PhD dissertation. Utrecht University.
Neeleman, Ad. (2002). Particle placement. In: Nicole Dehé et al. (eds.) *Verb-Particle Explorations* (141–164). Berlin: Mouton de Gruyter.
Neeleman, Ad, and Hans van de Koot. (2002). The Configurational Matrix. *Linguistic Inquiry* 33:529–574.
Neeleman, Ad, and Hans van de Koot. (2008). Dutch Scrambling and the Nature of Discourse Templates. *Journal of Comparative Germanic Linguistics* 11:137–189.
Neeleman, Ad, and Hans van de Koot. (2010). A Local Encoding of Syntactic Dependencies and its Consequences for the Theory of Movement. *Syntax* 13:331–372.
Neeleman, Ad, and Fred Weerman. (1993). The Balance between Syntax and Morphology: Dutch Particles and Resultatives. *Natural Language and Linguistic Theory* 11:433–475.
Neeleman, Ad, and Fred Weeman. (1999). *Flexible Syntax*. Dordrecht: Kluwer.
Nilsen, Øystein. (2003). *Eliminating Positions; Syntax and Semantics of Sentence Modification*. PhD dissertation, University of Utrecht.
Nilsen, Øystein. (2005). Some Notes on Cyclic Linearization. *Theoretical Linguistics* 31:173-183.

Nissenbaum, Jon. (2001). *Investigations of Covert Phrasal Movement*. PhD dissertation, MIT.
Partee, Barbara, Alice ter Meulen and Robert Wall. (1990). *Mathematical Methods in Linguistics*. Dordrecht; Boston: Kluwer Academic.
Pearson, Matt (2007). Predicate Fronting and Constituent Order in Malagasy. Ms. Reed College.
Perlmutter, David (ed.). (1983). *Studies in Relational Grammar* (Vol. 1). Chicago: University of Chicago Press.
Phillips, Colin. (2003). Linear Order and Constituency. *Linguistic Inquiry* 34:37–90.
Phillips, Colin, and Matt Wagers. (2007). Relating Structure and Time in Linguistics and Psycholinguistics. In: Gareth Gaskell (ed.) *Oxford Handbook of Psycholinguistics* (739–756). Oxford: OUP.
Podobryaev, Alexander. (2013). Differential Case Marking in Turkic as Intermediate Dependent Case. In: Klaus von Heusinger, Jaklin Kornfilt, and Umut Özge (eds.) *Proceedings of the 8th Workshop on Altaic in Formal Linguistics* (281–292). Cambridge, MA: MITWPL.
Pollock, Jean Yves. (1989). Verb Movement, Universal Grammar, and the Structure of IP. *Linguistic Inquiry* 20:365–424.
Öztürk, Balkız. (2005). *Case, Referentiality and Phrase Structure*. Amsterdam: John Benjamins.
Quirk, Randolph, Sidney Greenbaum, Geoffrey Leech and Jan Svartvik. (1985). *A Comprehensive Grammar of the English Language*. London: Longman.
Reinhart, Tanya. (2002). The Theta System: An Overview. *Theoretical Linguistics* 28:229–290.
Reinhart, Tanya. (2006). *Interface Strategies*. Cambridge: MIT Press.
Reuland, Eric. (1990). Head Movement and the Relation between Morphology and Syntax. In: Geert Booij and Jaap van Marle (eds.), *Yearbook of morphology 1990* (129–161). Dordrecht: Foris.
Reuland, Eric. (Ed.) (2000). Arguments and Case; Explaining Burzio's Generalization. Amsterdam: John Benjamins.
Richards, Norvin. (2001). *Movement in Language: Interactions and Architectures*. Oxford: OUP.
Roeper, Thomas, and Samuel Jay Keyser (1992). Re: The Abstract Clitic Hypothesis. *Linguistic Inquiry* 23:89–125.
Ross, J.R. (1967). *Constraints on Variables in Syntax.* PhD dissertation, MIT.
Ruys, Eddy. (2001). Dutch Scrambling and the Strong-Weak Distinction. *Journal of Comparative Germanic Linguistics* 4:39–67.
Saito, Mamuro. (1992). Long Distance Scrambling in Japanese. *Journal of East Asian Linguistics* 1: 69–118.
Saito, Mamuro, and Naoki Fukui. (1998). Order in Phrase Structure and Movement. Linguistic Inquiry 29:439–474.
Shlonsky, Ur. (2010). The Cartographic Enterprise in Syntax. *Language and Linguistics Compass* 4: 417-429.
Skopeteas, Stavros, and Gisbert Fanselow. (2010). Focus in Georgian and the Expression of Contrast. *Lingua* 120:1370–1391.
Sportiche, Dominique. (1988). A Theory of Floating Quantifiers and its Corollaries for Constituent Structure. *Linguistic Inquiry* 19: 425-451.
Starke, Michal. (2001). *Move Dissolves into Merge: a Theory of Locality*. PhD dissertation, University of Geneva.
Stowell, Timothy. (1981). *Origins of Phrase Structure.* PhD diss. MIT.

Svenonius, Peter. (1996). The Verb-Particle Alternation in the Scandinavian Languages. Ms. University of Tromsø.
Svenonius, Peter, and Gillian Ramchand. (2014). Deriving the Functional Hierarchy. Ms. University of Tromsø. To appear in *Language Sciences*.
Tsujioka, Takae. (2002). *The Syntax of Possession in Japanese*. New York, NY: Routledge.
Van de Koot, Hans, Renita Silva, Claudia Felser and Mikako Sato. (2015). Dutch A-Scrambling Is Not Movement: Evidence from Antecedent Priming. Ms. UCL. To appear in *The Linguistic Review*.
Vanden Wyngaerd, Guido. (1989). Object Shift as an A-Movement Rule. *MIT Working Papers in Linguistics* 11:256–271.
Van der Wal, Jenneke. (2006). The Disjoint Verb Form and an Empty Immediate After Verb position in Makhuwa. In *Papers in Bantu Grammar and Description*, ZASPiL 43: 233–256.
Van Riemsdijk, Henk. (1992). Complements, Adjuncts and Adjacency in Phrase Structure. In: Liliane Tasmowski and Ann Zribi-Hertz (Eds.), *De la musique à la linguistique – Hommages à Nicolas Ruwet* (498–512). Ghent: Communication and Cognition.
Vikner, Sten. (1994). Scandinavian Object Shift and West Germanic Scrambling. In: Norbert Corver and Henk van Riemsdijk (eds.) *Studies on Scrambling: Movement and Non-Movement Approaches to Free Word-Order Phenomena* (487–517). Berlin: Mouton de Gruyter.
Vincente, Luis. (2005). Licensing Objects with and without Movement. In: John Alderete, Chung-hye Han and Alexei Kochetov (eds.) *Proceedings of WCCFL 24* (362–369). Somerset: Cascadilla Press.
Weerman, Fred. (1989). *The V2 Conspiracy; A Syntactic and A Diachronic Analysis*. Dordrecht: Foris.
Williams, Edwin. (1980). Predication. *Linguistic Inquiry* 11:203–238.
Williams, Edwin. (1986). NP Trace in Theta Theory. *Linguistics and Philosophy* 4:433–447.
Williams, Edwin. (1994). *Thematic Structure in Syntax*. Cambridge, MA: MIT Press.
Williams, Edwin. (2003). *Representation Theory*. Cambridge, MA: MIT Press.
Woolford, Ellen. (2003). Burzio's Generalization, Markedness, and Locality Constraints on Nominative Objects. In Ellen Brandner and Heike Zinsmeister (eds.) *New Perspectives on Case Theory* (301-329). Stanford CA: CSLI.
Wurmbrand, Susi. (2001). *Infinitives: Restructuring and Clause Structure*. Berlin: Mouton de Gruyter
Zwart, C. Jan-Wouter. (1993). *Dutch Syntax: A Minimalist Approach.* PhD dissertation, University of Groningen.
Zaenen, Annie, Joan Maling and Höskuldur Thráinsson. (1985). Case and Grammatical Functions: The Icelandic Passive. *Natural Language and Linguistic Theory* 3:441–483.

London, September 2015