1. Introduction

Kayne (1994) drew attention to the problem of the association of linear order with hierarchical structure. He re-introduced the idea that all languages share a universal base. This universal base is not semantic. Koster (1988) claims that “in the field of word semantics there has hardly been any progress” (translated from Dutch), and Koster (1992) points out that many semantic proposals of the 20th century have been around for hundreds of years.

Of course, the problem of associating hierarchical structure with linear order belongs to the core business of syntax, but generative grammarians have rarely questioned the assumption that hierarchical structure automatically determines linear order. Generative theory had allowed adjunction to the left and to the right, and it had allowed complements and specifiers to precede and follow heads. This led to predictions about natural language like the following:

(1) As there are languages with Verb-First, there must be languages with V-last
    As there are languages with V-Second, there must be languages with V-Last-but-One

To the best of our knowledge, there are no such languages. Hence, not all mirror effects are actually attested; some that were attested were mentioned in Koster (1974), who proposed a mirror rule to account for them. So, at the empirical level, Kayne’s book invites us to chart the presence and absence of mirror effects in natural languages. In this article, I will investigate such an asymmetry in the domain of Verb-Raising.

Ever since Evers’ (1975) epoch-making dissertation, verb clusters in Continental West-Germanic languages have been one of the hotspots of syntactic research (Bennis 1992; den Dikken 1994, 1996; Haegeman 1992, 1994; Haegeman & van Riemsdijk 1986;
Reuland 1982; Zwart 1995, 1996, 2007). A stock example of such a verb cluster is presented below:

(2) Omdat ik jou wel zou hebben willen blijven
because I you PRT would have want stay
zie stand toekijken.
see stand watch

‘Because I would have liked to see you continue standing there watching.’

The verbs form a cluster at the end of the clause. In this particular example, the verb cluster is not interrupted by nonverbal material. In what follows, I shall investigate whether verb clusters in English, Dutch and Frisian display any absence of mirror effects with respect to the interruption of the verb cluster by nonverbal material. I will categorise verb order in the verbal cluster with the help of numbers (as in Zwart 1996). To illustrate, consider the following example sentences from Modern Dutch and Modern Frisian:

(3) a. Modern Dutch, verb order 123 = head-initial
Wie weet waarom Huntelaar niet mocht worden geselecteerd.
who knows why Huntelaar not might-1 become-2 selected-3.
‘Who knows why Huntelaar was not allowed to be selected.’

b. Modern Frisian, verb order 321 = head-final
Wa wit wêrom’t Huntelaar net selektearre wurde mocht.
who knows why Huntelaar not selected-3 might-2 become-1
‘Who knows why Huntelaar was not allowed to be selected.’

The numbers express the direction of the selection relation. Mocht selects worden in (3a), and not vice versa, hence mocht is assigned a number that is exactly 1 less than worden. Thus the numbers reflect selection (and c-command) relations. The data also reflect the presence of a mirror effect: both the head-initial order 123 is found (in Dutch), as well as the head-final order 321 (in Frisian).

2. Break-up of verbal clusters

2.1 Pure head-initial and head-final orders: 123 and 321
Koopman (1990) charted break-up in verbal clusters consisting of three verbs in the Old English corpus. It turns out that the order 123 could be broken up in Old English, much the same as in Modern West Flemish:

(4) Old English 123
a. 1 X 2 3
Thaet he eft mage aet sumon saele beon geclaensod.
that he afterwards may at some time be purified
‘That he may afterwards be purified at some time.’
b. 1 2 X 3

Thaet hi ne sceoldon beon to swidhe afyrhte.
that they not might be too strongly terrified
‘That they might not be too terrified.’

The X signifies the material breaking up the verb cluster. The following amounts of head-initial occurrences are reported by Koopman:

\[
\begin{array}{cccc}
1 & 2 & 3 & 1 X 23 \\
12 & X & 3 & 1 X 2 X 3 \\
343 & 156 & 151 & 50 \\
\end{array}
\]

Let’s turn next to the head-final pattern. Koopman (1990: 49) notes that it “shows no variation at all. In all the cases the three verbs are adjacent.”

\[
\begin{array}{cccc}
3 & 2 & 1 & 3 X 21 \\
3 & X & 2 & 1 \\
80 & 0 & 0 & 0 \\
\end{array}
\]

(7) Old English 321

\[
3 \Rightarrow ^* 3 X 2 1 \\
X 2 \Rightarrow ^* 3 2 X 1 \\
\]

So the order 321 is found, but it is never broken up by nonverbal material. Van der Meer (1990) and Hoekstra (2007) argue that the same generalisations hold for Old Frisian. The data indicate that break-up is ungrammatical in a head-final subcluster, while being allowed in a head-initial subcluster.

(8) Break-up in subclusters of three-verb clusters

\[
\begin{array}{ccc}
1 & X & 2 \\
3 & X & 2 \\
X & 3 & 2 \\
\end{array}
\]

There are two ways of making this generalisation more precise:

(9) a. Hypothetical generalisation 1: Strict head-initiality

A subcluster of two verbs may be broken up only if the preceding head selects the following head.

b. Hypothetical generalisation 2: Relaxed head-initiality

A subcluster of two verbs may be broken up only if the preceding head selects the following head or there is an additional head such that the preceding head selects the additional head and the additional head selects the following head.

(9b) amounts to a ban on interrupted head-final substructures, but allowing it where the head-final substructure is joined to the overarching structure, provided that the head-final substructure follows the selecting head. (9a) bans both an interrupted head-final substructure and an interruption at the point of juncture.
2.2 Mixed clusters (head-initial and head-final subclusters)

These hypotheses make different predictions about the subclusters 13 and 31:

\[(10)\] Predictions for the subclusters 13 and 31:

<table>
<thead>
<tr>
<th></th>
<th>1 X 3</th>
<th>3 X 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strict head-initiality:</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Relaxed head-initiality:</td>
<td>OK</td>
<td>*</td>
</tr>
</tbody>
</table>

The subcluster 1 X 3 occurs in the clusters 1 X 3 2 and 2 1 X 3, and both are attested in Old English:

\[(11)\] a. 1 X 3 2

That he moste sumum rican menn to bearne geteald beon
that he might some powerful man as child accounted be

‘That he might be accounted the child of some powerful man.’

b. 2 1 X 3

That dhu wurdhan scealt mid urum swurdum ofslagen mid him.
that you become must with our swords killed with him

‘That you must be killed with our swords together with him.’

Break-up in (a) only occurs between 1 and 3, but never between 3 and 2. The break in (b) occurs between 1 and 3, never between 2 and 1. That implies we can discard the Hypothesis of Strict head-initiality, as it would incorrectly rule out sentences like the two above.

The relaxed head-initiality hypothesis makes the following predictions about the remaining order 231:

\[(12)\] 2 X 3 1 OK

2 3 X 1 *

Unfortunately, neither order is found in Old English, regardless of whether there is break-up or not.

2.3 Independent evidence: Particles in the verbal cluster
in Dutch and Frisian

We saw that a head-final order was never broken up by nonverbal material in Old English. Interestingly, the same generalisation holds for modern Dutch and Modern Frisian. A head-final V-cluster may not be broken up in Dutch by a particle, whereas a head-initial cluster may (Bennis 1992):

\[(13)\] Modern Dutch, head-initial

a. Omdat hij mij op wou bellen.
because he me up wanted call

‘Because he wanted to call me up.’
b. Omdat hij mij wou op bellen.
   because he me wanted up call

(14) Modern Dutch, head-final
a. Omdat hij mij op bellen wou.
   because he me up call wanted
b. *Omdat hij mij bellen op wou.
   because he me call up wanted

Dutch by and large allows at most head-final clusters of 2 verbs. Frisian only has head-final clusters (disregarding to-infinitives), and this multi-verb cluster is absolutely impenetrable for nonverbal material:

(15) Modern Frisian, head-final
a. Omdat ik dy him op beljen hearre wollen hawwe soe.
   because I you him up call-5 hear-4 wanted-3 have-2 would-1
b. *Omdat ik dy him beljen op hearre wollen hawwe soe.
   *Omdat ik dy him beljen hearre op wollen hawwe soe.
   d. *Omdat ik dy him beljen hearre wollen op hawwe soe.
   e. *Omdat ik dy him beljen hearre wollen hawwe op soe.

These data support the generalisation saying that a head-final V-cluster may not be broken up. We also noted that the prediction in (12) could not tested. However, there are Dutch dialects allowing the order 23X1 (Pauwels 1965, Barbiers, Van der Auwera, Bennis, Boef, De Vogelaer en van der Ham 2009):

(16) a. Aarschots (Pauwels 1965: 109)
   Dat ik verleden jaar een huis doen bouwen heb.
   that I last year a house make-2 build-3 have
   ‘That I had a house built last year.’

b. Katwijks (de Vink 2004: 118)
   Hij was bang dat ie blijve zitte mos.
   he was afraid that he stay-2 sitting-3 must-1
   ‘He was afraid that he had to stay put.’

Testing the hypothesis leads to sentences like the following:

(17) a. 2 X 3 1, prediction: OK
   De soldaete hoorde tot ze blijve deur vichte mosse
   the soldiers heard that they stay-2 through fight-3 must-1
   ‘The soldiers heard that they had to continue fighting.’

b. 2 3 X 1, prediction: *
   *De soldaete hoorde tot ze blijve vichte deur mosse
   the soldiers heard that they stay-2 fight-3 through must-1
3. Concerning generalisation (9b) and the relation between sisterhood and linear order

To sum up, a head-final subcluster may not be interrupted by nonverbal material. If this generalisation is correct, then it constitutes a remarkable asymmetry between head-initial and head-final subclusters. Here we witness again the absence of a mirror effect, providing support for the program outlined in Kayne (1994).

It must further be noticed that X cannot be found to the right of the cluster: *{123 – any order} X, unless X is an element occurring to the right of verbs generally, as is the case with sentences and extraposed PPs. Put differently, the ordering relation between x and the main verb is (painstakingly) maintained in verb clusters: V-Raising is not allowed to create new orders as far as the relative positioning of main verb and verbal dependents is concerned, a fact that has hitherto received little attention. Verb-Second, in contrast, is allowed to change the relative positioning of main verb and verbal dependents. Why shouldn’t verb clusters be allowed to strand verbal dependents under V-raising to a higher position (as Verb-second does)?

The answer could be that the mechanism producing verb clusters and ordering the verb with respect to its nonverbal dependents is a transderivational constraint; however, the formulation of transderivational constraints cannot be done in a checking approach (unless ad-hoc). Hence it must be the case that the verb in a verb cluster occupies a non-derived position.

Verbs in verb clusters can be base-generated provided that the direct dominance relations of the syntactic tree do not completely determine linear order. Linear order can then be locally manipulated if it is considered to be a feature which may percolate upwards. Percolation is local in the sense of Koster (2007), who argues that external merge and percolation make internal merge superfluous. Percolation makes it possible to reduce all configurational dependencies to sisterhood. Zwart (2006) shows this is feasible in the case of agreement. Percolation is very similar to movement, in fact, it may
be viewed as the movement of features determining (among other things) the spell-out position of elements. Chomsky (1995, 2001) has a less abstract view of internal merge (or movement), which is defined on syntactic categories. Under a more abstract view, merging with abstract features can be allowed, which would be the equivalent of percolation, which is independently needed for various processes (Koster 2007).

From a minimalist perspective, it comes as no surprise that linear order should be a feature that is subject to parametric variation. After all, linear order has to do with spell-out. Syntax roughly defines which features are relevant and under which conditions they are spelled out. The PF interface is the language-specific fine-tuning of these spell-out rules involving adjacency and linearity.

The question arises why head-final structures obey stricter spell-out rules than structures which are not head-final. For Kayne (1994), this relates to the fact that they are produced by internal merge, in contrast to head-initial structures. Alternatively, one might suppose that head-final spell-out takes place in the morphological component (where the head-final head-rule rules supreme), whereas head-initial spell-out takes place in the syntactic component. Head-final spell-out would then be subject to more restrictions than head-initial spell-out, a difference which now reduces to independently needed differences between morphology and syntax.

Percolation, or merger with abstract features, results in a change in the way we view syntactic structure. Rather than viewing it as categorial structure, we view it as a structure of features designating properties, some of which may be categorial. Let us conclude then with a quotation from Koster (1993:146) which describes the development linguistic theory has undergone in the past decades: “‘Move alpha’ can simply be seen as a subcase of local free property exchange”.

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References


