

## Revisiting Verb (Projection) Raising in Old English

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### 1. Introduction

Verb Raising and Verb Projection Raising are optional processes that permute the order of finite and non-finite verbs and their complements and adjuncts in West Germanic head-final languages.<sup>1</sup> Examples in Swiss German are shown in (1), where we follow the common practice of using numbers to indicate the scopal relations of the verbs, with 1 having the highest scope. In (1a), the verbs are in their head-final order, and the finite verb appears in clause-final position. (1b) illustrates Verb Raising (VR), with permutation of the finite and non-finite verbs. (1c) illustrates Verb Projection Raising (VPR), where the finite verb has permuted with the verb projection containing not only the non-finite verb but also the object *da Buech*. All of the three orders in (1) are grammatical and fully acceptable in Swiss German.

- (1) a. *dass de Hans da Buech **chaufe wöt**.*      2-1      (Swiss German)  
that the John this book buy-2 wants-1  
'that John wants to buy this book'
- b. *dass de Hans da Buech **wöt chaufe**.*      1-2      VR  
that the John this book wants-1 buy-2
- c. *dass de Hans **wöt** da Buech **chaufe**.*      1 ... 2      VPR  
that the John wants-1 this book buy-2

VR and VPR have been the focus of a large number of studies in the past several decades; see Wurmbrand (2006) for a recent and detailed overview and Wurmbrand (2001) for an on-line bibliography of work on verb clusters. Perhaps one reason for this focus is that the use of VR and VPR varies along several dimensions (language/dialect, speaker and type

of finite verb): for example, while in some varieties of Swiss German VR and VPR are only possible with modals as shown in (1), there are other varieties in which reordering also affects the auxiliaries *have* and *be* with participles. The explanation of variation of this type has proved to be difficult within formal generative syntactic frameworks.

These studies present valuable data on acceptable orders of verbs within clusters in modern West Germanic and on whether reordering is categorical or optional in particular languages and dialects. However, there exists very little quantitative data for modern languages where reordering is optional. A notable exception is Cornips (2004, 2009), who investigates the frequency of reordering in verb clusters for 67 speakers of Heerlen Dutch (the Netherlands); her results will briefly be discussed below in Section 3.2.

Like other West Germanic languages, Old English (OE) exhibits variation with respect to the order of verbs and their complements and adjuncts. Examples are given in (2):

- (2) a. þæt þu **feohtan mæge**                      2-1                      (Old English)  
       that you fight-2 can-1  
       ‘that you can fight’  
       (coalive,+ALS\_[Edmund]:67.7003)
- b. þæt heo **mæge spræcan**                      1-2  
       that she can-1 speak-2  
       ‘that she can speak’  
       (coalive,+ALS\_[Sebastian]:94.1268)
- c. þæt ic **mihte God forbeodan**            1 ... 2  
       that I could-1 God forbid-2  
       ‘that I could forbid God’  
       (coalive,+ALS[Peter's\_Chair]:186.2398)

There exist a few studies of VR and VPR in the older stages of Germanic (see, for example, Hoeksema 1993 for Middle Dutch and Robinson 1997 for Old High German), but analyses of VR and VPR for historical data are not as common as for modern languages. The first generative account of VR and VPR in OE is found in van Kemenade (1987), but she presents no quantitative results. There exists no comprehensive and large-scale quantitative study of OE VR and VPR in the literature, with the exception of Koopman (1990), who however examined the frequencies of linear orders only in clauses with three (but not two) verbal elements. His results will be discussed below in Section 2.2.<sup>2</sup>

The aims of this paper are two-fold: first, to provide a descriptive overview of the word order variation found in verb clusters on the basis of a large corpus of OE texts; and second, to explore the theoretical consequences of this variation. The paper is organized as follows. In Section 2, we present a detailed description of the OE data, and examine the order found in verb clusters with two and three verbal elements. In Section 3, we analyze the verb cluster variation under two different analyses of OE clause structure, in order to determine the effect of the structural analysis on the quantitative results. In Section 4, we present conclusions and implications. All of the OE data was retrieved from the York-Toronto-Helsinki Parsed Corpus of Old English Prose (henceforth the YCOE), an annotated corpus of 1.5 million words of OE prose (Taylor et al 2003). Except where noted, the data are restricted to subordinate clauses with overt complementizers or subordinating conjunctions, to abstract away from the possible effects of verb seconding in OE main clauses.<sup>3</sup>

We make the following basic assumptions about OE structure and syntax. First, VR and VPR in OE must be distinguished from the obligatory head movement of the finite verb to a functional projection above the VP; see Section 3.1 for further discussion. Second, VR and VPR can apply only in head-final languages; for ease of exposition, we will assume that they involve rightward movement of non-finite verbs and their projections over the finite verb. Third, VR and VPR are in some sense the same type of syntactic movement, and therefore can be grouped together when we consider quantitative data.

## 2. Verb Clusters in OE: A Descriptive Overview

### 2.1. Clauses with two verbal elements

In this section we look at OE subordinate clauses with two verbal elements, one finite and one non-finite, and describe and quantify the variation in linear order found in the data. It is important to emphasize that we are not at this point distinguishing the effects of VR and VPR from the effects of finite verb movement. When we examine the data in this way, we find variation in the linear order along four different dimensions – finite verb type, author, text, and date of composition – but not all of these dimensions show consistent patterns or trends.

Table 1 shows that the type of finite verb has an effect on the order of finite and non-finite verbs: perfective *have* has a much lower rate of 1 (...) 2 order than the other verb types, 33.9% vs. 60.0-64.4%. OE examples with modals illustrating the two orders were given above in (2).

**Table 1.** OE subordinate clauses with two verbal elements, finite and non-finite, linear order by finite verb type

For verb clusters with 2-1 order, the two verbal elements are almost always adjacent: we have found only 11 exceptions in the YCOE out of 7471 subordinate clauses with two verbs (0.15%). An example of a subordinate clause with a constituent positioned between the non-finite and finite verbs is given in (3).

- (3) hu hie **gedon** ymbe pa menn **haefdan**  
how they done-2 about the men had-1  
'... how they had dealt with the men ...'  
(cobede, Bede\_5:11.416.25.4189)

The descriptive generalization here is that head-initial verbal projections cannot be dominated by head-final verbal projections. We will assume that non-adjacency in these constructions is not grammatical in OE:

- (4) \* [[ V<sub>2</sub> XP ] V<sub>1</sub> ] or more generally \* [[ V<sub>n</sub> XP ] V<sub>n-1</sub> ], where the numbers in subscripts represent scope

Table 2 presents the frequency of the two linear orders by text in three groups: Alfredian texts, which were written early in the OE period, and those written by Ælfric and Wulfstan, both late OE writers. It is clear that the use of 1 (...) 2 vs. 2-1 order varies by author: the overall frequency of 1 (...) 2 order in the Alfredian texts (52.9%) is similar to that of Wulfstan (50.2%) but very different from that of Ælfric (68.1%). In addition, Table 2 shows that the texts written by Ælfric are remarkably consistent in their use of 1 (...) 2 order, while the Alfredian texts and the Wulfstan texts are not. The variation within the Alfredian texts may well reflect the fact that they are not the work of a single author: texts categorized as Alfredian were translated in the time of King Alfred, late in the ninth century, but there is disagreement on whether Alfred himself was the author.<sup>4</sup>

**Table 2.** OE subordinate clauses with two verbal elements, finite and non-finite, linear order by author and text

Finally, consider the frequency of linear order by date of composition, shown in Table 3. We have divided the texts into two OE periods, early (before 950) and late (after 950).<sup>5</sup>

**Table 3.** OE subordinate clauses with two verbal elements, finite and non-finite, linear order by date of composition and author. Early = before 950, Late = after 950.

Table 3 shows that while there is variation in the use of 1 (...) 2 order during the OE period, there is no clear pattern of change over time: in other words, the frequency of use of 1 (...) 2 order does not increase significantly from the early period to the late period.

## 2.2. Clauses with three verbal elements<sup>6</sup>

Because the number of OE subordinate clauses with three verbal elements is much smaller than the number with two verbal elements (compare Tables 4 and 1: 430 vs. 18,681 clauses), it is not possible to make similar divisions of the data by type of finite verb, author, text and date of composition and still get statistically meaningful results. Therefore, in this section we will simply present and discuss the linear orders that exist in the data, with observations about their distribution and characteristics. Table 4 shows that only five of the six possible orders of the three verbs are found in subordinate clauses in the YCOE:

**Table 4.** Linear order in OE subordinate clauses with three verbal elements,  
one finite and two non-finite

The absence of clauses with 2-3-1 order is expected from a cross-linguistic point of view: Wurmbrand (2006:241) states that 2-3-1 occurs only in what has been called the *Infinitivus Pro Participio* (IPP) construction, in which an expected infinitive is replaced by a participle. Since the IPP construction does not exist in OE, the absence of 2-3-1 orders is in line with Wurmbrand's cross-linguistic observations. In addition, Wurmbrand claims that 2-1-3 order is not attested in Germanic. We have found only two instances of OE subordinate clauses with this order, thus supporting her claim.<sup>7</sup> The two examples are given in (5):

- (5) a. Ac for þæra gebeorge ... ðe he **habban wyle** **gehealden & geholpen**  
 But before their refuge ... that he have-2 wants-1 held-3 and supported-3  
 'But in front of their refuge ... that he wants to have held and supported ...'  
 (cowulf, WHom\_5:109.235)

- b. þæt ðær nænig wiht      wylsþrynges **beon mihte**    on **gesewen**  
 that there no      trace (of) spring      be-2 might-1 in seen-3  
 ‘... that no trace of a spring might be seen in it.’  
 (cobede, Bede\_4:29.366.17.3667)

Most subordinate clauses with three verbal elements, regardless of their order, involve a finite modal, passive *be*, and a past participle (387/430 = 90.0%). In the majority of cases, the three verbal elements are adjacent (269/430 = 62.6%). Most of the 161 clauses in which the verbal elements are not adjacent have 1-2-3 order (131/161 = 81.4%). We have found three cases of unexpected non-adjacency, e.g. 1 (...) 3 XP 2; these are similar to the small number of cases with constituents between the non-finite verb and the finite verb in two-verb clusters, and they violate the generalization in (4). An example is shown in (6):

- (6) And sume men ... þe    nyde      **sculan** of    cyricgemanan      þas halgan tid  
 And some men ... who necessarily must-1 from church-membership the holy    period  
     **ascadene**    mid rihte **weorðan** for healican synnan, ...  
     excluded-3 with right be-2      for heinous    sins  
 ‘And some men ... who necessarily and rightly must be excluded from church-  
 membership during the holy period because of heinous sins, ...’  
 (cowulf, WHom\_14:36.1301)

In this section we have described the linear order within two- and three-element verb clusters in OE subordinate clauses. We can see that there is variation in linear order with respect to the type of finite verb, the author, and perhaps the individual text. We can also observe that the constraints on ordering in clusters with two and three verbs are identical to those found in the modern West Germanic languages.

### 3. The analysis of verb clusters in OE

#### 3.1. The structural analysis of OE and VR/VPR

The West Germanic languages that have been investigated with respect to VR and VPR are those that are traditionally analyzed as head-final in projections below CP. In subordinate clauses in these languages, variation in the order of verbs can be derived only by VR and VPR, rather than by movement of the finite verb to a head-initial projection.<sup>8</sup>

But Pintzuk (1999) has shown that OE is not strictly head-final, and that IPs in particular can be either head-initial or head-final. If the finite verb moves to I, this means that variation in the order of verbal elements can be derived in two different ways: from head-initial structure by finite verb movement, or from head-final structure by VR and VPR. This of course has implications for our analysis of VR and VPR: much of the word order variation in verb clusters could be due to variation in the underlying structure rather than to processes of VR and VPR. We illustrate with two derivations for (2b) and (2c), repeated below as (7a) and (8a).<sup>9</sup> As stated in Section 1, for the sake of concreteness we assume VR and VPR to be rightward movement of V and VP. As is clear from the b and c structures, in some cases the two derivations yield the same surface word orders.

(7) a. þæt heo **mæge spræcan**

that she can-1 speak-2

‘that she can speak’

(coalive,+ALS\_[Sebastian]:94.1268)

b. þæt heo [<sub>I</sub> mæge<sub>i</sub> ] spræcan t<sub>i</sub> (head-initial IP)

c. þæt heo t<sub>i</sub> mæge [<sub>V</sub> spræcan]<sub>i</sub> (head-final IP with VR)

(8) a. þæt ic **mihte God forbeodan**

that I could-1 God forbid-2

‘that I could forbid God’

(coalive,+ALS[Peter's\_Chair]:186.2398)

- b. þæt ic [<sub>I</sub> mihte<sub>i</sub> ] God forbeodan t<sub>i</sub> (head-initial IP)
- c. þæt ic t<sub>i</sub> mihte [<sub>VP</sub> God forbeodan]<sub>i</sub> (head-final IP with VPR)

However, word order variation in the verb cluster cannot be entirely reduced to variation in IP directionality, since there are some clauses that are unambiguous cases of VR and VPR, unlike (7) and (8). To see this, consider Pintzuk's analysis in more detail. She makes the following assumptions:

- (9) Pintzuk (1999)
  - a. IP is not split, and it is the highest functional projection below CP.
  - b. IP varies in headedness, and finite verbs always move to I, regardless of whether IP is head-initial or head-final.
  - c. Topics (usually subjects in subordinate clauses) move to Spec,IP.
  - d. Unstressed elements like pronouns and short sentential adverbs adjoin to the left or right periphery of Spec,IP.

This means that in head-initial structures, there can be only one heavy constituent before the finite verb, since the only position for heavy constituents is Spec,IP. Therefore, a diagnostic for head-final structure is the occurrence of two or more heavy constituents before the finite verb or the verb cluster. Both 2-1 and 1 (...) 2 orders are possible in such clauses, as shown in (10). (10b) and (10c) and similar clauses must involve VR and VPR, since they cannot be derived by leftward movement of the finite verb to I.

- (10) a. nu            se swicola deofol swa mærne sacerd **derian wolde**  
           now-that the deceitful devil so famous priest injure-2 would-1  
           '... now that the deceitful devil would injure so famous a priest.'  
           (coalive,+ALS\_[Martin]:1406.6900)

- b. forhwy swa rihtwis dema ænige unrihte gife **wille forgifan**  
 why so just ruler any wicked gift will-1 forgive-2  
 ‘... why so just a ruler will forgive any wicked gift’  
 (coboeth,Bo:38.119.26.2383)
- c. oþþe hwær ænegu þeod æt oþerre **mehte frið begietan**  
 or where any people from other might-1 peace obtain-2  
 ‘or where any people might obtain peace from the other’  
 (coorosiu,Or\_1:10.31.10.607)

It is clear that Pintzuk’s analysis requires not only variation in the headedness of IP but also optional use of VR and VPR in head-final structure. By comparing the frequency of clauses like (10b) and (10c) to (10a), Pintzuk (1999:68ff) measured the rates of VR (11.8%) and VPR (7.1%). It should be pointed out that the corpus used was small, consisting of only 1242 subordinate clauses, of which 93 could be used to measure the rate of VR and 14 the rate of VPR. The frequency of both processes combined was 12 out of 107 clauses or 11.2%. We will see in Section 3.2 that Pintzuk (1999) underestimated the rates of VR and VPR in OE subordinate clauses because of the small size of the corpus.

Of course, it is not only the size of the corpus that can affect the quantitative results: the measured frequency of VR and VPR depends upon the particular structural analysis that is used to determine which clauses are unambiguous cases. To understand this, consider Haerberli (2001, 2005), who proposes a different analysis of OE with the following assumptions:

(11) Haerberli (2001, 2005):

- a. IP is split into AgrP and TP.
- b. There are two subject positions: pronominal subjects are in Spec,AgrP and full DP subjects are generally in Spec,TP.
- c. Material (in particular, adjuncts) can occur in the specifier position of a functional projection between AgrP and TP.
- d. Finite verbs generally move to Agr in main clauses and to T in subordinate clauses.
- e. The directionality of TP varies, head-initial vs. head-final.

We can see that the diagnostics for head-final structure under Haerberli's analysis are different from Pintzuk's. In particular, while a clause like (12a) would be head-final in terms of Pintzuk's analysis, it could be head-initial for Haerberli, as shown in (12b): Agr is empty, the heavy XP adjunct *oft and gelome* occurs between AgrP and TP, and the subject and finite verb are in TP. The head-final derivation for Haerberli with VPR is shown in (12c).

(12) a. Comp-XP-Subj(DP)-Aux ... MV

þæt oft and gelome men **wurdon** of ðisum life **gelædde**

that often and frequently men were-1 from this life led-2

'... that men were often led from this life'

(cocathom2,+ACHom\_II,\_23:203.112.4495)

b. head-initial TP:

þæt [<sub>AgrP</sub> e oft and gelome [<sub>TP</sub> men [<sub>T</sub> wurdon] [<sub>VP</sub> of ðisum life gelædde]]]

c. head-final TP:

þæt [<sub>AgrP</sub> e oft and gelome [<sub>TP</sub> men t<sub>i</sub> [<sub>T</sub> wurdon]]] [<sub>VP</sub> of ðisum life gelædde]<sub>i</sub>

In contrast, the clause in (13a) is unambiguously head-final with VR in Haerberli's approach, under the assumption that nothing can intervene between the subject in Spec,TP and the verb in T in a head-initial TP.

(13) a. Comp-XP-Subj(DP)-XP-Aux ... MV

þæt æfre Iudeisce men hyder on land myd scype **sceoldon cuman**  
 that ever Jewish men here on land with ship must-1 come-2  
 '... that Jewish men should ever come to this land by ship.'  
 (covinsal, VSa1\_1\_[Cross]:3.6.18)

b. head-final TP:

þæt [<sub>AgrP</sub> e æfre [<sub>TP</sub> Iudeisce men [<sub>VP</sub> hyder ... t<sub>i</sub>] [<sub>T</sub> sceoldon]]] [<sub>V</sub> cuman]<sub>i</sub>

A slightly weaker form of this diagnostic for head-final structure with VR/VPR is shown in (14):

(14) a. Comp-Subj(DP)-XP-Aux ... MV

þæt se cniht beforan eallum þam broðrum **gewearð** þurh deoflum **geswænced**  
 that the youth before all the brothers was-1 by devils afflicted-2  
 (cogregdC, GDPref\_and\_3\_[C]:33.242.28.3425)

b. head-final TP:

þæt [<sub>AgrP</sub> e [<sub>TP</sub> se cniht [<sub>VP</sub> beforan eallum þam broðrum t<sub>i</sub>] [<sub>T</sub> gewearð ]]]  
 [<sub>VP</sub> þurh deoflum **geswænced** ]<sub>i</sub>

Clauses like (14) are a weaker diagnostic for VR/VPR because, in contrast to (13), there is no adjunct to the left of the subject and hence no element showing that the subject must be in Spec,TP. Instead, the subject could have moved to AgrP, an option which may not be entirely excluded, at least marginally in main clauses (Haerberli 2002: 103). If that were the case for

subordinate clauses as well, a clause like (14) could be analyzed in terms of a head-initial structure, with the subject in Spec,AgrP, the adjunct between AgrP and TP and the verb in T in a head-initial TP. Thus, an analysis based on (14) may lead to a small overestimation of head-final structure and VR/VPR.

Notice that all of (12a), (13a), and (14a) are unambiguously head-final with VR or VPR under Pintzuk's analysis, because in all cases there are two or more heavy constituents before the finite verb. Since the two analyses, Haeberli and Pintzuk, derive clauses like (12a) differently, we must determine how important these differences in analysis are when we try to establish the status and frequency of VR and VPR as rightward movement processes in OE.

### **3.2. Revisiting Pintzuk (1999) with a larger database**

As was stated above, Pintzuk (1999) measured the frequency of VR and VPR as 11.2% in a small OE corpus. When we use the same diagnostic (two heavy constituents before the finite verb) on the much larger YCOE, the results are significantly different, as will be shown below. We have categorized the data not only by finite verb type but also by period, early vs. late, to see whether the frequency of VR and VPR changes over the OE period.

**Table 5.** Frequency of VR/VPR in OE subordinate clauses that are unambiguously head-final for Pintzuk 1999, e.g. (10a-c), by finite verb type and period

There are several observations to be made about the data shown in Table 5. First, there is variation by finite verb type similar to that found in other verb cluster languages: the frequency of VR and VPR is low for perfective *have*, and much higher for modals. This same pattern is found in other Germanic languages: for example, Zwart (1993:338) cites Stroop (1970:250) and states that both 1-2 and 2-1 orders are acceptable for clauses with perfective *have* and a past participle in standard Dutch, but that the 2-1 order is “overwhelmingly more prominent”. For clauses with modals, Zwart (1993:339) again cites Stroop (1970:254, 256) and states that the 1-2 order “is clearly favored in both written and spoken Dutch.” Cornips

(2009:207ff.) reports a similar pattern in a corpus study of 67 speakers of Heerlen Dutch. With a perfective or passive auxiliary and a past participle, both the 1-2 order and the 2-1 order are regularly used although the frequency of 1-2 is lower (182/558: 32.6%). With modals, however, the 1-2 order is almost categorical, and there are only occasional instances of 2-1 in Cornips' corpus (14/554: 2.5%).

Apart from modals, there are three other verb categories in Table 5 (passive *be*, progressive *be*, and auxiliary) that have much higher frequencies of VR and VPR than perfective *have* in OE, and these clauses need further investigation. The relatively low numbers of clauses with finite progressive *be* and auxiliaries makes their significance difficult to evaluate. What appears to be a high frequency of VR and VPR with passive *be* may be due to the fact that participles in some of these clauses are adjectival rather than verbal, with their position derived by rightward movement of the AdjP rather than VR and VPR (see also Koopman 1990:57-59). Koopman (1990:41) provides another possible explanation: he notices that in OE glosses of Latin texts, the Latin passive infinitive is almost always translated by passive *be* and the past participle in that order. Koopman was investigating clauses with three verbal elements, and so passive *be* in these clauses was always infinitival. It is possible that the finite Latin passive is also translated by passive *be* and the past participle in that order, thus increasing the frequency of 1-2 order for this verb type.

Secondly, we can see from Table 5 that the frequency of VR and VPR for each verb type does not change over the Old English period: results of chi-square tests for statistical significance show that the small decrease in frequency of VR/VPR for modals and the small increase for perfective *have* are not statistically significant (chi-square = .64,  $p < 1$ ; chi-square = .20,  $p < 1$ , respectively). This fact has important consequences for the way we interpret change in the position of the finite verb over the OE period. Recall that clauses with the finite verb in second position can be derived either from head-initial structure by finite verb movement, or from head-final structure by VR and VPR, as was illustrated in examples (7) and (8). Let us make the reasonable assumption that the use of VR and VPR is the same in clauses that are unambiguously head-final as in those that are ambiguously head-initial or

head-final. If the frequency of clauses with finite verbs in second position increases over the OE period,<sup>10</sup> as Pintzuk (1999) has claimed, then that increase must be due to an increase in head-initial structure, rather than an increase in the frequency of VR and VPR.

The third observation to be made about the data in Table 5 is that the frequency of VR and VPR is much higher than in Pintzuk (1999): 30.4% compared to 11.2%. This demonstrates the importance of using very large corpora like the YCOE to investigate relatively low frequency phenomena, particularly for quantitative analysis.

Consider now the data in Table 6, which shows the frequency of VR/VPR in clauses with finite modals for the Alfredian texts, Wulfstan, and Ælfric. The first generalization to be made is that the frequency of VR/VPR can vary significantly by author: in the Alfredian texts of the Early Old English period, the frequency is 16.7%; for Wulfstan and Ælfric, writing in the Late Old English period, the frequencies are 36.0% and 11.2%. While the difference between the Alfredian texts and Ælfric is not statistically significant (chi-square = 2.13,  $p < .2$ ), the difference between Wulfstan and the Alfredian texts and between Wulfstan and Ælfric is significant in each case (chi-square = 5.16,  $p < .025$ ; chi-square = 10.52,  $p < .01$ , respectively). We can therefore conclude that usage varies significantly by author. Cornips (2004) presented similar variation for speakers of Heerlen Dutch. Those speakers who optionally reorder verb clusters vary in their frequency of doing so: for example, for perfective auxiliaries with past participles, the frequency of 1-2 order ranges from 9.1% to 91.7% for the individual speakers.

Because of the small numbers of clauses of unambiguously head-final subordinate clauses with modals, it is difficult to draw firm conclusions about the frequency of VR and VPR for individual texts, as we did in investigating linear order in Table 2: the numbers in Table 6 for most of the texts are simply too small. However, there are a few texts with relatively large numbers. For example, if we compare the Alfredian texts *Boethius*, *Cura Pastoralis*, and *Orosius* (21, 21, and 38 tokens respectively), we can see that the frequencies of VR/VPR are similar for the latter two texts (19.0% and 15.8%) and in turn different from the first text (38.1%). The texts written by Ælfric show similar variation: while the two Catholic Homilies texts have very low frequencies of VR/VPR (4.9% and 0.0% with 41 and

30 tokens, respectively), with a much higher rate for Lives of Saints (35.0% with 20 tokens). While not all of these differences are statistically significant by chi-square tests, it seems reasonable to conclude that the frequency of VR/VPR varies not only by author but also within individual texts.

**Table 6.** Frequency of VR/VPR in OE subordinate clauses with modals that are unambiguously head-final for Pintzuk 1999, e.g. (10b-c), by author and text

One final point should be made here. It was demonstrated in Section 3.1 that not all variation in the position of the finite verb can be attributed to variation in IP directionality, since the unambiguously head-final clauses in (10) exhibited different orders in the verb cluster; we concluded from these data that even under Pintzuk's analysis, there was strong evidence for the existence of VR and VPR in OE. We can now reverse this argument and use the frequency of VR and VPR as evidence for variation in IP directionality. Consider the frequency of VR/VPR by finite verb type shown in the bottom total section of Table 5, which is the frequency in clauses with two or more heavy constituents before the verb cluster, i.e. those that under Pintzuk's analysis are unambiguously head-final. Let us make the reasonable assumption that VR/VPR applies in a similar way in clauses with only one heavy constituent before the verb cluster, i.e. those like (7a). If all such clauses were derived by VR/VPR, then we would expect the frequency of 1 (...) 2 orders shown in Table 1 to be similar to the frequency of VR/VPR shown in Table 5, even given the variation by author and text that we have found above. Contrary to expectation, however, we find the linear order frequencies in Table 1 to be consistently higher than the structural frequencies shown in Table 5. This means that a substantial proportion of the clauses with linear 1 (...) 2 order must be derived by movement of the finite verb to a head-initial functional projection.

### **3.3 VR/VPR under Haerberli's (2001, 2005) analysis**

As was stated above in Section 3.1, the measured frequency of VR and VPR depends upon the particular structural analysis that is used. We have seen clear trends in the data under

Pintzuk's analysis, and in this section we look at the same data analyzed under Haeberli's (2001, 2005) analysis.

First, consider the frequency of VR and VPR in OE subordinate clauses that are unambiguously head-final for Haeberli, like that shown in (13a) with an adjunct before the DP subject, followed by other material before the verb cluster. These numbers are very small -- there are less than 100 clauses in total -- and there are too few to make further divisions in the data, i.e. by date, author, and text. Nevertheless, they show a similar distribution to the results in Table 5 for Pintzuk's analysis.

**Table 7.** Frequency of VR/VPR in OE subordinate clauses that are unambiguously head-final for Haeberli (2001, 2005), e.g. (13), by finite verb type

In order to further investigate the factors influencing VR/VPR, we will therefore use the less restrictive diagnostic for head-final structure shown in (14), under the assumption that full DP subjects normally remain in Spec,TP, and therefore that clauses with material between the full DP subject and the finite verb are indeed head-final. However, as pointed out above, this diagnostic may lead to a slight overestimation of the frequencies.

Using the less restrictive diagnostic, the frequency of VR/VPR in OE subordinate clauses is shown in Table 8 below. The patterns are very similar to those for Pintzuk's analysis shown in Table 5. First, there is variation by finite verb type, with the frequency of VR/VPR much higher for modals than for perfective *have*, and the same high frequencies for passive *be*, progressive *be*, and auxiliaries. Second, the frequency of VR and VPR for each verb type does not change over the Old English period.<sup>11</sup> And third, the frequencies are again much higher than those found by Pintzuk (1999). In fact, the frequencies of VR/VPR for Haeberli are even higher than those for Pintzuk in Section 3.2 above, and the differences are statistically significant for modals, although not for perfective *have*: chi-square = 20.75,  $p < .001$  and chi-square = 2.75,  $p < .1$ , respectively. This confirms our view that the structural analysis of VR/VPR affects the quantitative results, and suggests that further investigation is needed into the structural analysis of OE clauses.

**Table 8.** Frequency of VR/VPR in OE subordinate clauses that are unambiguously head-final for Haeberli (less restrictive, e.g. (14)), by finite verb type and date

Finally, let us consider the frequency of VR/VPR in clauses with modals by author and text, as shown in Table 9. Again, for some texts the numbers are too small for comparison, but the patterns are clear for the texts with relatively large numbers. One perhaps unexpected result is that the frequency of VR/VPR does not vary significantly by author: the difference between 33.9% for the Alfredian texts, 46.7% for Wulfstan, and 31.5% for Ælfric is not statistically significant. But this may be because there is a great deal of variation within texts. Compare, for example, the Alfredian texts: Bede (15.2%), Boethius (55.6%), *Cura Pastoralis* (45.5%), and Orosius (38.1%). Similarly, compare the texts written by Ælfric: *Lives of Saints* (42.1%), *Catholic Homilies I* (35.7%) and *Catholic Homilies II* (19.2%). None of the differences for individual texts were statistically significant, but this may well be because of the small numbers.

**Table 9.** Frequency of VR/VPR in OE subordinate clauses with modals that are unambiguously head-final for Haeberli (less restrictive, e.g. (14)), by author and text

Our general conclusions remain the same regardless of the analysis used: there is a significant difference in the use of VR/VPR for different types of finite verbs, for different authors, and perhaps for different texts by the same author. However, the frequency of VR/VPR does not change over time. The patterns are the same for the two analyses, but the difference in frequencies between the two is statistically significant: for example, if we compare the data by author in Tables 6 and 9, the difference is statistically significant for the Alfredian texts (chi-square = 10.64,  $p < .01$ ) and for Ælfric (chi-square = 14.31,  $p < .001$ ), although not for Wulfstan (chi-square = .44,  $p < 1$ ).

#### **4. Conclusions and Implications**

In this paper, we have shown that the frequency of VR/VPR in OE varies by author, text and finite verb type. This makes OE similar to other Germanic languages that show verb clustering effects.

We compared the frequencies of VR/VPR in OE using two different structural analyses, Haerberli (2001, 2005) and Pintzuk (1999). We found that the two analyses produce similar patterns of use of VR/VPR. Although there were statistically significant differences in the frequencies themselves, the results under the two analyses were similar enough that this investigation does not give us strong arguments in favor of one analysis over the other.

Whichever analysis is used, it is clear that the frequency of VR/VPR in OE is significantly higher than Pintzuk (1999) found using a smaller database. This result confirms the importance of using large corpora for quantitative syntactic investigations and their structural interpretation. Furthermore, these findings have implications for the analysis of change in directionality of functional projections during the OE period. Due to the relatively low frequencies of VR/VPR found in Pintzuk (1999), she could assume that these processes do not significantly interfere with measurements of head-initial and head-final structure and therefore that they could be ignored. In contrast, we have found much higher frequencies of VR/VPR; this suggests that these processes should be taken into account when measuring quantitatively the structural changes that occurred during the OE period.

#### **Footnotes**

<sup>1</sup> Wurmbrand (2006:234) states that Hungarian can be categorized as a verb cluster language, i.e. one that permits VR/VPR, but that it has many characteristics that distinguish it from the West Germanic verb cluster languages. Our investigation in this paper is limited to Old English and comparisons within the West Germanic language family.

<sup>2</sup> Although Schmid and Trips (2003) present quantitative data for VR/VPR in Old and Middle English, they do not give structural diagnostics, so it is difficult to interpret their results.

<sup>3</sup> Although it is generally accepted that OE is a verb-second (V2) language, the nature and domain of the V2 effect in OE is still a matter of some debate (see Haeberli 2002, Kroch and Taylor 1997, Pintzuk 1999).

<sup>4</sup> Bately (1970, 1980), among others, suggests on the basis of lexical and textual evidence that the translations of Boethius and Soliloquies, as well as the first version of *Cura Pastoralis*, were done by Alfred, but that the rest had different authors. This distinction may be supported by the data in Table 2 if we focus on texts with high numbers of tokens. Whereas Bede and Orosius (not attributed to Alfred by Bately) have lower 1-2 frequencies (42.3% and 45.2%, respectively), the frequencies for Boethius and Soliloquies are higher (59.9% and 51.6%, respectively), although chi-square tests do not consistently support these distinctions.

<sup>5</sup> Three of the texts in the YCOE are not datable even within these broad categories; therefore the totals for Tables 1 and 3 are not the same, since the three texts have been omitted from Table 3.

<sup>6</sup> Koopman (1990) also examined order and adjacency in three-verb clusters in OE using a larger corpus than the YCOE (the complete Toronto Dictionary of Old English Corpus); our results confirm his.

<sup>7</sup> Koopman (1990:52-53) found one additional subordinate clause, in a manuscript not included in the YCOE, plus two main clauses with this order.

<sup>8</sup> Under a Kaynian head-initial framework, the arguments presented in this section would be presented differently. But regardless of the framework used, a distinction must be made between languages traditionally analyzed as head-final, like those listed above, and languages traditionally analyzed as head-initial, like Modern English and the Scandinavian languages: word order in the former group can be affected by VR and VPR, while word order in the latter cannot. It is this distinction that is important here.

<sup>9</sup> To simplify the exposition, we ignore all irrelevant movement here, such as movement of the subject to Spec,IP and movement of the finite verb to I in the head-final c examples.

<sup>10</sup> Although the data in Table 3 show that there is no change over the OE period in the frequency of 1 ... 2 order, these data do not allow us to draw conclusions about the finite verb in second position. As shown in (10b-c), clauses with 1 ... 2 order do not necessarily

have the verb in second position. Thus there may be an increase in verb-second order despite stable frequencies for 1 ... 2 orders.

<sup>11</sup> Once again, the difference between frequencies for modals and perfective *have* for the early period and the late period is not statistically significant: chi-square = 3.21,  $p < .1$  for modals; chi-square = .06,  $p < 1$  for perfective *have*.

## Tables

**Table 1.** OE subordinate clauses with two verbal elements, finite and non-finite, linear order by finite verb type

finite verb	1 (...) 2 order	2-1 order	Total	% 1 (...) 2
modal	5193	3456	8649	60.0%
perfective <i>have</i>	325	633	958	33.9%
passive <i>be</i>	5222	3086	8308	62.9%
progressive <i>be</i>	383	248	631	60.7%
auxiliary <sup>a</sup>	87	48	135	64.4%
Total	11210	7471	18681	60.0%

<sup>a</sup> ‘Auxiliary’ verbs in the YCOE include the following raising or control verbs when they take bare infinitival complements: *aginnan/onginnan/beginnan* ‘begin’, *cuman* ‘come’, *becuman* ‘become’, *feran* ‘go’, *gan/gegan* ‘go’, *gewitan* ‘go’. These verbs are often used periphrastically or to indicate aspect in OE.

**Table 2.** OE subordinate clauses with two verbal elements, finite and non-finite,  
linear order by author and text

Author/Text	1 (...) 2	2-1	Total	% 1 (...) 2
<b>Alfredian</b>				
Bede	643	878	1521	42.3%
Boethius	537	360	897	59.9%
Cura Pastoralis				
preface	12	14	26	46.2%
text	1012	559	1571	64.4%
Laws				
introduction	7	12	19	36.8%
text	31	26	57	54.4%
Orosius	423	513	936	45.2%
Soliloquies				
preface	3	9	12	25.0%
text	148	139	287	51.6%
<b>Total Alfredian</b>	2816	2510	5326	52.9%
<b>Wulfstan</b>				
Homilies	197	191	388	50.8%
Canons of Edgar	9	13	22	40.9%
<b>Total Wulfstan</b>	206	204	410	50.2%
<b>Ælfric</b>				
Homilies	492	212	704	69.9%
Lives of Saints				
preface	2	1	3	66.7%
text	862	374	1236	69.7%
Catholic Homilies I				
preface	14	8	22	63.6%
text	908	456	1364	66.6%
Catholic Homilies II				
preface	0	3	3	0.0%
text	762	380	1142	66.7%
Genesis				
preface	21	5	26	80.8%
epilogue	6	2	8	75.0%
Letter to Sigefyrth	13	5	18	72.2%
Letter to Sigeward	78	46	124	62.9%
Letter to Wulfgeat	31	6	37	83.8%
Letter to Wulfsgige	40	19	59	67.8%
Letter to Wulfstan I	34	21	55	61.8%
Letter to Wulfstan II	34	15	49	69.4%
De Temporibus Anni	43	14	57	75.4%
<b>Total Ælfric</b>	3340	1567	4907	68.1%

**Table 3.** OE subordinate clauses with two verbal elements, finite and non-finite, linear order by date of composition and author. Early = before 950, Late = after 950.

Date of composition	1 (...) 2	2-1	Total	% 1 (...) 2
<b>Early</b>				
Alfredian	2816	2510	5326	52.9%
Other early texts	2273	1127	3400	66.9%
Total early texts	5089	3637	8726	58.3%
<b>Late</b>				
Ælfric	3340	1567	4907	68.1%
Wulfstan	206	204	410	50.2%
Other late texts	2155	1732	3887	55.4%
Total late texts	5701	3503	9204	61.9%

**Table 4.** Linear order in OE subordinate clauses with three verbal elements, one finite and two non-finite

order	N	% of total
1-2-3	306	71.2%
1-3-2	48	11.2%
2-1-3	2	0.5%
2-3-1	0	0.0%
3-1-2	7	1.6%
3-2-1	67	15.6%
Total	430	100.0%

**Table 5.** Frequency of VR/VPR in OE subordinate clauses that are unambiguously head-final for Pintzuk 1999, e.g. (10a-c), by finite verb type and period

period	finite verb	VR/VPR		Total	% VR/VPR
		1 (...) 2 order	No VR/VPR 2-1 order		
early	modal	58	191	249	23.3%
	perfective <i>have</i>	5	77	82	6.1%
	passive <i>be</i>	106	142	248	42.7%
	progressive <i>be</i>	17	21	38	44.7%
	auxiliary	4	5	9	44.4%
	Total early	190	436	626	30.4%
late	modal	63	245	308	20.5%
	perfective <i>have</i>	3	30	33	9.1%
	passive <i>be</i>	110	126	236	46.6%
	progressive <i>be</i>	3	9	12	25.0%
	auxiliary	1	0	1	100.0%
	Total late	180	410	590	30.5%
total	modal	121	436	557	21.7%
	perfective <i>have</i>	8	107	115	7.0%
	passive <i>be</i>	216	268	484	44.6%
	progressive <i>be</i>	20	30	50	40.0%
	auxiliary	5	5	10	50.0%
	Total	370	846	1216	30.4%

**Table 6.** Frequency of VR/VPR in OE subordinate clauses with modals that are unambiguously head-final for Pintzuk 1999, e.g. (10b-c), by author and text

Author / Text	VR/VPR 1 (...) 2	No VR/VPR 2-1	Total	% VR/VPR
<b>Alfredian</b>				
Bede	5	61	66	7.6%
Boethius	8	13	21	38.1%
Cura Pastoralis				
preface	0	1	1	0.0%
text	4	17	21	19.0%
Laws				
introduction	1	1	2	50.0%
text	1	2	3	33.3%
Orosius	6	32	38	15.8%
Soliloquies				
preface	0	0	0	-
text	1	3	4	25.0%
<b>Total Alfredian</b>	26	130	156	16.7%
<b>Wulfstan</b>				
Homilies	9	16	25	36.0%
Canons of Edgar	0	0	0	-
<b>Total Wulfstan</b>	9	16	25	36.0%
<b>Ælfric</b>				
Homilies	3	6	9	33.3%
Lives of Saints				
preface	0	1	1	0.0%
text	7	13	20	35.0%
Catholic Homilies I				
preface	0	3	3	0.0%
text	2	39	41	4.9%
Catholic Homilies II				
preface	0	2	2	0.0%
text	0	30	30	0.0%
Genesis				
preface	0	1	1	0.0%
epilogue	0	0	0	-
Letter to Sigefyrth	0	0	0	-
Letter to Sigeweard	0	1	1	0.0%
Letter to Wulfgeat	0	0	0	-
Letter to Wulfsig	0	1	1	0.0%
Letter to Wulfstan I	0	3	3	0.0%
Letter to Wulfstan II	0	3	3	0.0%
De Temporibus Anni	0	0	0	-
<b>Total Ælfric</b>	12	103	115	10.4%

**Table 7.** Frequency of VR/VPR in OE subordinate clauses that are unambiguously head-final for Haeberli (2001, 2005), e.g. (13), by finite verb type

finite verb	VR/VPR		Total	% VR/VPR
	1 (...) 2 order	No VR/VPR 2-1 order		
modal	9	36	45	20.0%
perfective <i>have</i>	0	10	10	0.0%
passive <i>be</i>	15	25	40	37.5%
progressive <i>be</i>	1	1	2	50.0%
auxiliary	0	1	1	0.0%
<b>Total</b>	<b>25</b>	<b>73</b>	<b>98</b>	<b>25.5%</b>

**Table 8.** Frequency of VR/VPR in OE subordinate clauses that are unambiguously head-final for Haerberli (less restrictive, e.g. (14)), by finite verb type and date

period	finite verb	1 (...) 2 order	2-1 order	Total	% VR/VPR
early	modal	72	109	181	39.8%
	perfective <i>have</i>	11	67	78	14.1%
	passive <i>be</i>	93	137	230	40.4%
	progressive <i>be</i>	12	14	26	46.2%
	auxiliary	3	4	7	42.9%
	<b>Total early</b>	<b>191</b>	<b>331</b>	<b>522</b>	<b>36.6%</b>
late	modal	64	142	206	31.1%
	perfective <i>have</i>	5	35	40	12.5%
	passive <i>be</i>	96	119	215	44.7%
	progressive <i>be</i>	5	9	14	35.7%
	auxiliary	0	0	0	-
	<b>Total late</b>	<b>170</b>	<b>305</b>	<b>475</b>	<b>35.8%</b>
total	modal	136	251	387	35.1%
	perfective <i>have</i>	16	102	118	13.6%
	passive <i>be</i>	189	256	445	42.5%
	progressive <i>be</i>	17	23	40	42.5%
	auxiliary	3	4	7	42.9%
	<b>Total</b>	<b>361</b>	<b>636</b>	<b>997</b>	<b>36.2%</b>

**Table 9.** Frequency of VR/VPR in OE subordinate clauses with modals that are unambiguously head-final for Haeberli (less restrictive, e.g. (14)), by author and text

Author and text	1 (...) 2	2-1	Total	% 1 (...) 2
<b>Alfredian</b>				
Bede	5	28	33	15.2%
Boethius	15	12	27	55.6%
Cura Pastoralis				
preface	0	1	1	0.0%
text	10	12	22	45.5%
Laws				
introduction	0	1	1	0.0%
text	0	2	2	0.0%
Orosius	8	13	21	38.1%
Soliloquies				
preface	0	0	0	-
text	0	5	5	0.0%
<b>Total Alfredian</b>	38	74	112	33.9%
<b>Wulfstan</b>				
Homilies	7	8	15	46.7%
Canons of Edgar	0	0	0	-
<b>Total Wulfstan</b>	7	8	15	46.7%
<b>Ælfric</b>				
Homilies	5	5	10	50.0%
Lives of Saints				
preface	0	1	1	0.0%
text	8	11	19	42.1%
Catholic Homilies I				
preface	0	2	2	0.0%
text	10	18	28	35.7%
Catholic Homilies II				
preface	0	1	1	0.0%
text	5	21	26	19.2%
Genesis				
preface	0	1	1	0.0%
epilogue	0	0	0	-
Letter to Sigefyrth	1	0	1	100.0%
Letter to Sigeward	0	1	1	0.0%
Letter to Wulfgeat	0	0	0	-
Letter to Wulfsgie	0	0	0	-
Letter to Wulfstan I	0	2	2	0.0%
Letter to Wulfstan II	0	0	0	-
De Temporibus Anni	0	0	0	-
<b>Total Ælfric</b>	29	63	92	31.5%

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