THE RECATEGORIZATION OF MODALS IN ENGLISH: EVIDENCE FROM ADVERB PLACEMENT*

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1. INTRODUCTION

In Present-Day English (PDE) clauses containing a finite auxiliary, adverbs can occur in a position immediately following the auxiliary or immediately preceding it. This variation is illustrated in (1).

(1) a. She **will** *probably* read it. (SAuxAdvV)

b. She *probably* **will** read it. (SAdvAuxV)

As Huddleston and Pullum (2002:780) point out, however, "the order shown in [1a] is not only possible but quite strongly preferred over that shown in [1b]". Similarly, Quirk et al. (1985:494) add the diacritic "(?)" to an example that is comparable to (1b) whereas the equivalent of (1a) is treated as fully acceptable. Several authors have examined the nature of this variation in PDE in some detail (e.g. Granath 2002, Jacobson 1975, Waters 2011, 2013). However, very little work has focused on the diachronic development. The main exception is Jacobson (1981), but his study is based on an extremely limited corpus.

There are at least two reasons why the diachrony of the variation in (1) is of interest. First, besides negation, inversion, ellipsis and emphatic polarity, adverb placement is one of the diagnostics that distinguish main verbs from auxiliaries in PDE. Whereas the use of the

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pre-auxiliary position of adverbs is rather restricted, pre-verbal placement is very common (*She probably read it*). On the other hand, immediate post-auxiliary placement is common, while immediate post-verbal placement is restricted as for example when the main verb takes a direct object (**She read probably it*). In earlier English, however, these differences did not exist. The emergence of adverb placement as a diagnostic for the auxiliary/main verb distinction may therefore shed new light on the diachronic development towards the modern auxiliary system that characterizes PDE, in particular also the emergence of the distinctive class of modals. A second reason why the diachrony of the variation in (1) is of interest is the fact that it has been maintained for centuries. It therefore provides the basis for a case study in long-term syntactic variation and may shed some light on the question why some cases of syntactic variation lead to change whereas others seem to remain stable.

For reasons of space, we will not be able to address the second issue mentioned above but we will return to it in future work. Instead, what we will focus on in this paper is the first aspect, and more specifically the diachronic development of the distribution of adverbs with respect to modals. The history of modals in English has played a very prominent role in the literature in diachronic generative syntax over the last forty years (cf. Lightfoot 1979 and much subsequent work). By examining the distribution of modals with respect to adverbs, we will provide new empirical evidence to evaluate proposals that have been made with respect to the historical development of modals in the earlier literature. There is a general consensus that modals underwent a reanalysis at the beginning of the Early Modern English (EModE) period, which changed their categorial status from lexical to functional. Accounts differ with respect to whether this recategorization involved a radical change from V to T or whether this transition was less abrupt in that modals were already categorially distinct in some way as compared to regular main verbs before they became purely functional items. These two options make somewhat different predictions with respect to adverb placement. Presenting

quantitative data concerning verb movement and, more specifically, the distribution of finite main verbs and finite modals with respect to adverbs from Old English (OE) to EModE, we will show that, while the behaviour of the two types of elements up to the reanalysis of the modals is not entirely identical, their overall diachronic development is. Given furthermore that the observed differences can be accounted for independently of a categorial distinction, we conclude that adverb placement does not provide any evidence against the hypothesis that modals and main verbs are categorially identical in the early history of English. Finally, our data will provide new evidence for the dating of the reanalysis of the modals and confirm proposals that have been made in the earlier literature.

The structure of this paper is as follows. In section 2, we will briefly present the main aspects of previous work on the development of modals in the history of English, and we will explore the predictions made by this work with respect to adverb placement. In section 3, we will test these predictions on the basis of quantitative evidence drawn from the syntax of adverbs. As a starting point, we will introduce previous research of ours on the development of adverb placement with respect to main verbs. We will then compare those findings with data involving modals and we will explore the implications for the analysis of the categorial change affecting modals. The comparison of main verbs and modals will also allow us to evaluate earlier proposals concerning the dating of the recategorization of modals in English. Section 4 concludes the paper.

2. THE RECATEGORIZATION OF MODALS

2.1. *Earlier work on the history of modals in English*

Ever since Lightfoot's (1979) seminal work, the historical development of the English modals has attracted a lot of interest in the literature. In PDE, modals have a wide range of properties that distinguish them from main verbs. They lack non-finite forms, do not take complements

(except bare infinitives), have no agreement morphology, cannot be iterated, precede *not* in negative clauses and the subject in interrogatives, can license VP fronting and VP ellipsis, and can be phonologically reduced. The ancestors of the PDE modals, i.e. what Lightfoot calls the pre-modals, generally do not have these properties. Instead, they behave to a large extent like regular main verbs in earlier English. The historical development towards a distinctive class of modals has been summarized as follows (cf. Aitchison 1980:141-2, cited in Denison 1993:336):

(2) *Stage 1.* A slow moving away of the premodals from other verbs between Old English and the end of the 15th century.
Stage 2. A much faster withdrawal of (pre)modals from other verbs in the 16th century.
Stage 3. A continued, slowed-down moving away of (pre)modals from other verbs after the 16th century.

Various aspects of this development have remained controversial, however, in particular certain empirical details and the exact analysis of the change affecting the grammatical system. With respect to the analysis, two main positions can be distinguished. The first one is to assume that pre-modals are regular main verbs in OE and Middle English (ME), i.e. that the ancestors of modals belong to the word category V. The other one is to assume that in OE and ME pre-modals already represent a categorially distinct sub-group of verbs.

The first position is argued for most prominently by Lightfoot (1979, 1999, 2006) (but cf. also e.g. Allen 1975, Roberts 1985, 1993, Roberts and Roussou 2003). As pre-modals have non-finite forms, full person-number agreement and nominal complementation (direct objects), Lightfoot argues that they should be assimilated to lexical verbs. According to him, the transition from OE full verb to PDE modal auxiliary is a syntactic phenomenon. More

precisely, he suggests that the syntactic categories of verbs and modals restructure radically in EModE so that modals change word category and become elements of the category I, i.e. inflectional elements. This change corresponds to Stage 2 in (2) above and it manifests itself mainly in the loss of non-finite forms and the loss of the ability to occur with a direct object. The recategorization of the modals is caused by changes occurring in the ME period (cf. Lightfoot 2006:30f.). One of these changes is related to the morphology of modal auxiliaries. Modals become the only surviving members of the preterite-present category of verbs, i.e. verbs whose present tense forms have past morphology (and therefore no third person singular inflection). Other preterite-present verbs are assimilated to more regular verb classes or drop out of the language altogether. In addition, the past forms of the modals become opaque from a semantic point of view because they no longer indicate past-time reference but survive with subjunctive-type meanings. This accentuates their morphological distinctiveness further, and it is following these morphological changes that modals are assigned a new category, a development that has been situated in the early 16th century (cf. e.g. Lightfoot 2006:31, Roberts 1993:310f.).

Aspects of Lightfoot's original (1979) account have been criticised by various authors (e.g. Denison 1990, Plank 1984, Warner 1983) and several of these criticisms have been taken into account in some of Lightfoot's later work (e.g. 1999, 2006). Nevertheless, some issues remain controversial. The most substantial re-examination of the development of auxiliaries in the history of English can be found in Warner (1993), where, on the basis of detailed empirical work, the author proposes a lexical account of these changes. Warner's approach to syntactic categories draws on elements of traditional structural linguistics and on insights from a theory of human categorisation developed in psychology. The main idea is that the lexicon is a point of contact between general principles of cognitive organisation and generative grammar. Human categorisation is taken to involve basic and subordinate

categories, with clusters of associated properties which oppose categories. These classes are not homogeneous and do not have clear-cut boundaries. Basic categories are most internally coherent and have most distinctive properties whereas subordinate levels have fewer distinctive properties and are less clearly defined.

Warner agrees that OE auxiliaries, modals and non-modals, have to be identified as verbs. This is because they share important properties with the rest of this class, including the complementation characteristics and their morphosyntactic properties. However, Warner also observes that auxiliaries already have distinctive characteristics in OE, for example with respect to ellipsis. Furthermore, certain modals (*shall*, *mot*) seem to have a restriction to finite use already in OE, which would be another unexpected property of simple lexical verbs. Warner therefore argues that there is already a subordinate 'auxiliary' word class in OE with distinctive formal characteristics. In other words, he proposes that pre-modals/auxiliaries should be distinguished from lexical verbs, as a subcategory of verbs, and this well before the 16th century, contrary to what is suggested by Lightfoot. However, the 16th century also plays a central role in Warner's account, and more specifically a "period whose centre is 1500" (Warner 1993:211). Although not postulating a "cataclysmic" change of the type proposed by Lightfoot, Warner agrees that there is a certain acceleration in the development of modals during this century in that earlier properties are generalized (e.g. loss of non-finite forms, full correspondence of the preterite-present morphology with the modal group) and new properties emerge (difference between auxiliaries and lexical verbs concerning the placement of adverbs, appearance of tag questions, appearance of clitic forms, appearance of contracted negatives). According to Warner, these developments have the cumulative effect of giving rise to a new basic-level category of auxiliary. Warner argues that one advantage of his approach compared to Lightfoot's is that while for Lightfoot the changes that auxiliaries undergo in OE/ME are "a chance piling up of irregularities" (1993:218), they can be seen as a

movement towards a steadily more coherent and distinct status within his approach. It also accounts for certain differences between modals and lexical verbs before the 16th century.

In summary, Lightfoot and Warner agree on a change affecting the categorial status of modals in the 16th century. What distinguishes their analyses are the assumptions concerning the situation before this event. In Lightfoot's analysis, modals are regular lexical verbs, in Warner's framework they already form a subcategory among verbs. In principle, these two hypotheses could lead to different predictions with respect to the syntactic development of modals. Since modals and main verbs are not different from a categorial point of view before the 16th century in Lightfoot's approach, they would be expected to have exactly the same syntactic properties throughout the OE and ME periods. In Warner's analysis, however, modals are categorially distinct before the 16th century already, and this would make it possible for them to have syntactic properties that differ from those of main verbs. As mentioned above, Warner indeed argues that such properties can be identified in OE already (ellipsis, restriction to finite forms for some modals). Here, we will examine an entirely different empirical domain to test the predictions made by the two approaches, namely the behaviour of main verbs and modals with respect to verb movement (V-movement).

2.2. *Predictions for the development of V-movement*

The distributional properties of negation and adverbs provide the main diagnostics to determine whether a language has V-movement out of the VP or not (cf. Pollock 1989 among many others). A language has V-movement if verbs occur to the left of negation and certain adverbs, and it does not have such movement if the verb occurs to the right of negation and adverbs.[1] As often observed in the literature (e.g. Roberts 1985, 1993, Kroch 1989), English

[1] Language-specific properties may then make the picture somewhat more complex. For example, despite the absence of V-movement in PDE, certain adverbs can occur to the right of the verb. This can be argued to be due to an alternative structural option that does not involve V-movement (cf. section 3.1 below). Similarly, even

undergoes a change in this domain of the grammar during its history. Whereas early English shows clear evidence for movement of finite main verbs, such movement cannot be found in PDE. As for the timing of this change, we show in Haeberli and Ihsane (2016) that the loss of V-movement in English is a two-step process. V-movement past adverbs starts declining in the middle of the 15th century and is to a large extent lost by the middle of the 16th century while V-movement past negation begins a rather slow decline in the 16th century that is then completed over 200 years later. In Haeberli and Ihsane (2016), we analyze this mismatch between the two contexts in terms of a stepwise decline of V-movement. Assuming an inflectional domain of the type TP-MP-AspP-NegP for the periods of the history of English that are relevant for our purposes, we initially have a situation where finite main verbs move to T. In the first phase of the change, V-movement past adverbs to a high inflectional head (T and M) starts being lost, but V-movement past negation to Asp remains possible. Then, in the second phase, V-movement to Asp is lost as well, and we obtain a grammar in which V-movement is no longer possible at all.

The two approaches to the diachrony of modals in English discussed earlier make somewhat different predictions with respect to the behaviour of modals in connection with the decline of V-movement. Since modals cannot be distinguished categorially from main verbs up to the 16th century in Lightfoot's analysis, we expect the diagnostics for V-movement not to allow us to detect any differences between the two before the 16th century. Contrasts should then start emerging only after the categorial reanalysis. In Warner's approach, modals are distinct at the subordinate level before the 16th century already, and, assuming that subordinate-level distinctions may have an impact on the syntax, modals could in principle

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though a language may show signs of V-movement, it is possible for sentential negation to be found to the left of the verb (e.g. Italian, Hungarian). Such a situation may arise when the negative marker is a head that either blocks V-movement or procliticizes onto the verb (cf. also footnote 2 below).

show distinctive properties with respect to the diagnostics of V-movement. However, such a difference is not absolutely necessary as it could be the case that movement is driven by the basic-level category only (i.e. V). In that case, we would observe no differences between modals and main verbs before the 16th century, either.

The above observations mean that there would be one diachronic V-movement scenario that can distinguish Lightfoot's and Warner's approaches and there is one that cannot. A distinction is not possible if modals and main verbs behave identically with respect to the diagnostics for V-movement up to the 16th century. However, if modals and main verbs behave differently before the 16th century, we would have to conclude that modals and main verbs can already be distinguished by the syntax and that therefore Warner's proposal is supported.

The two main diagnostics for V-movement (negation, adverb) are not equally useful to test the predictions made by Lightfoot's and Warner's approaches. Before 1500 there is virtually no variation in the syntax of negation.[2] *Not* systematically follows any finite verbal elements (main verbs as well as pre-modals).[3] Furthermore, *do*-support, which ultimately replaces V-*not* order, is very rare before the 16th century,[4] and its earliest uses have been

[2] The only major area of variation in the period before the 15th century concerns the status of the preverbal negative marker *ne* as the frequency of its use declines during the ME period. However, since *ne* is a proclitic on the verb, it does not allow us to draw any conclusions with respect to the placement of the verb in the syntactic structure, and its status is therefore of no interest for our purposes.

[3] Occurrences of preverbal *not* are found with a certain frequency in early ME, but they can be related to residues of head-final structure rather than to the lack of V-movement (cf. Haeberli and Ingham 2007:18f.).

[4] In the data examined by Haeberli and Ihsane (2016), there is only one out of 217 negative declarative clauses (0.5%) that contains *do* in the period 1475-1500. Ellegård (1953) gives a frequency of 4.8% for the same period (33/693). But, as pointed out by Warner (1993:220f.), this frequency does not show the overall use of periphrastic

argued to be influenced by pragmatic or semantic factors (cf. e.g. Garrett 1998, Warner 1993:224). Periphrastic *do* in negative clauses only starts its rise in the 16th century, i.e. when modals are already being recategorized. Hence, the syntax of negation does not allow us to determine whether modals already behave differently from main verbs before 1500.

The situation is different for the syntax of adverbs. According to the findings in Haeberli and Ihsane (2016) mentioned above, evidence for V-movement past adverbs starts declining from the middle of the 15th century onwards. We can therefore compare the development of main verbs and modals in the short period of about 50 years that leads up to the recategorization of modals. Two possible scenarios are conceivable then. First, movement declines with main verbs but not with modals. Evidence for such scenario would come from a decrease of SVAdv order at the expense of SAdvV order with main verbs but not with modals. In this case, we would have support for Warner's approach. Alternatively, modals and main verbs initially develop in parallel with respect to adverb placement, with a split occurring only once the recategorization of the modals has taken place. Such a scenario is compatible with both approaches as they both consider early English modals to be fundamentally verbal in nature until their recategorization. The split would allow us to evaluate the dating of the recategorization that was proposed in the earlier literature on the basis of entirely independent evidence.

The aim of the following section is to examine the historical development of the distribution of main verbs and modals with respect to adverbs in order to determine which of the two scenarios described above corresponds to the situation in the late 15th century.

3. MAIN VERBS, MODALS, ADVERBS: HISTORICAL DEVELOPMENT

do but only the use in those texts that have instances of *do*. Warner estimates that, if all texts examined by Ellegård were included, the frequency would rather be around 3.6%.

3.1. *Main verbs and the distribution of adverbs*

In Haeberli and Ihsane (2016), we examine the distribution of adverbs with respect to finite main verbs in five parsed corpora: *The York-Toronto-Helsinki Parsed Corpus of Old English Prose* (YCOE; Taylor, Warner, Pintzuk, and Beths 2003), *The Penn-Helsinki Parsed Corpus of Middle English 2* (PPCME2 (1150-1500); Kroch and Taylor 2000), *The Parsed Corpus of Early English Correspondence* (PCEEC (c.1410-1695); Taylor, Nurmi, Warner, Pintzuk, and Nevalainen 2006), *The Penn-Helsinki Parsed Corpus of Early Modern English* (PPCEME (1500-1700); Kroch, Santorini, and Diertani 2004), and *The Penn Parsed Corpus of Modern British English* (PPCMBE (1700-1910); Kroch, Santorini, and Diertani 2010). Different contexts such as clauses with objects or clauses with specific adverbs are considered in order to determine the status of V-movement past adverbs over time. Here we will focus on the most general distributional evidence, namely the contrast between SAdvV order as opposed to SVAdv order as illustrated in (3) and (4).[5]

(3) *SAdvV*

a. In this temple he *often* **prayed**. (CMFITZJA,A6R.88; ?1495)

b. as smoke *kyndly* **signifieþ** fier, (CMWYCSER,347.2156; c1400)
'as smoke naturally signifies fire'

[5] In the two basic word order patterns we distinguish, additional constituents may occur in any position within the clause. Thus, SAdvV includes examples in which the verb is not in absolute final position but is followed by other elements like an object (cf. 3b) or other adjuncts. Similarly, with SVAdv, an additional constituent such as the object may follow the adverb (4b) or immediately precede it (4c). What is crucial for a clause to be classified as SAdvV or SVAdv is simply the relative order of the three elements, independently of the presence or absence of other constituents.

(4) *SVAdv*

a. Thou **seist** *wel*, (CMAELR4,16.456; a1450)

You say well

'You speak well'

b. that hyt **causyd** *aftyr* many mannys dethe. (CMGREGOR,196.1547; c1475)

that it caused after many men's death

'that it caused the death of many men afterwards'

c. if I **leve** hym *now*, (CMMALORY,63.2117; a1470)

'if I leave him now'

It must be stressed that a quantitative analysis of the contrast in (3) and (4) does not directly reflect the development of V-movement since it is not the case that one word order corresponds to movement and the other one to the absence of movement. Whereas cases like (3) can be considered as evidence for the lack of V-movement, the order SVAdv is ambiguous. It could involve V-movement, but since cases like (4a) and (4c) remain possible in a language without V-movement like PDE, it is a word order that must be derivable independently as well (i.e. through adjunction of the adverb to the right according to the traditional, non-Kaynian analysis). A comparison of SAdvV and SVAdv orders is nevertheless useful for our purposes as a rise in the frequency of SAdvV can be considered as a symptom of the decline of V-movement. Quantitative developments and the absence thereof then allow us to identify the beginning and the end of the change.[6] Furthermore, the SAdvV-

[6] As discussed in Haeberli and Ihsane (2016), certain word orders allow us to trace the loss of V-movement in a more precise way because they disappear as a consequence of the loss of V-movement. Relevant contexts are clauses with a non-heavy direct object (loss of SVAdvO order) and clauses with *never* (loss of SV*never* order).

SVAdv contrast has the advantage that it can be straightforwardly extended to data involving modals as will be shown in the next subsection.

Table 1 gives an overview of the development of SAdvV order in the periods that are relevant for our later comparison with modals, i.e. from OE to EModE. Included in the data are all affirmative main and subordinate clauses that contain an overt subject, a finite main verb and a one-word adverb of any semantic type, with the latter two in a position to the right of the subject. For the purposes of diachronic analysis, the data are divided as follows. For OE, the figures for the entire period are given. For ME, we follow the divisions of the PPCME2 up to 1420 (PPCME2 periods M1 to M3). Finally from 1420 onwards (late ME and EModE), we adopt the periodization introduced by Ellegård (1953) in his study of the rise of *do*-support.[7] Only texts that can be assigned clearly to one of the periods are included.[8]

The diachronic conclusions derived from these contexts converge to a large extent with those obtained from the SAdvV/SVAdv distinction.

[7] The only difference compared to Ellegård concerns period 8 (1525-1550), which is further subdivided by him into 1525-1535 and 1535-1550. For our data, there are no grounds to treat this period differently from the others.

[8] This means that all PPCME2 files with the extensions m23, m24, m34, mx4 are not included. These texts have composition dates and manuscript dates falling in different periods.

The data for periods 4 to 12 are taken from Haeberli and Ihsane (2016:512). The data for the earlier periods are not explicitly mentioned in Haeberli and Ihsane (2016) but were obtained in the context of the same study.

TABLE 1 *The distribution of finite main verbs and adverbs following an overt subject in Old, Middle and Early Modern English (YCOE, PPCME2, PCEEC, PPCEME)*

Period	SAdvV	SVAdv	Total	%SAdvV
1. OE	9410	4000	13410	70.2%
2. 1150-1250	299	483	782	38.2%
3. 1250-1350	25	160	185	13.5%
4. 1350-1420	164	1486	1650	9.9%
5. 1420-1475	161	1744	1905	8.5%
6. 1475-1500	123	622	745	16.5%
7. 1500-1525	211	355	566	37.3%
8. 1525-1550	432	844	1276	33.9%
9. 1550-1575	370	690	1060	34.9%
10. 1575-1600	460	891	1351	34.0%
11. 1600-1625	641	925	1566	40.9%
12. 1625-1650	466	705	1171	39.8%

SAdvV order undergoes substantial change in the history of English. Its frequency of occurrence is very high in OE. Then, SAdvV gradually declines and reaches a low point in the middle of the 15th century before becoming much more frequent again in the second half of the 15th century and the beginning of the 16th century.

The high frequency of SAdvV order in OE is partly due to the occurrence of head-final structure (both in main and subordinate clauses but with a higher frequency in subordinate clauses). However, even in clauses that are clearly head-initial, SAdvV order can be found with a certain frequency (28.7% in the data presented by Haeberli and Ihsane 2016:506). A striking aspect of the latter type of SAdvV order is that in a large majority of these cases (71.7%) we find the adverbs *þa* or *þonne* ('then'), which, apart from their temporal role, have been argued to have the function of discourse particles (van Kemenade and Los 2006). In Haeberli and Ihsane (2016:506/507), we propose that, although the finite verb can also occur in higher positions in OE main clauses (C and Fin), SAdvV order generally involves V-to-T movement. Under the assumption that TP shows variable directionality (cf. Pintzuk 1999 among others), SAdvV can be derived either through head-final TP and adverb placement anywhere below the subject position, or through head-initial TP, adverb placement in a

position above TP, which mainly attracts discourse particles, and subject placement above the adverb.[9]

After the OE period, SAdvV order declines rapidly. According to Haeberli and Ihsane's (2016) account, various factors contribute to this development. The first important factor is the loss of head-final TP as it eliminates one of the two OE options for deriving SAdvV order. The only remaining option is then weakened by two further changes: the decline of high adverbial discourse particles like *þa*/*þonne*, and the decline of the distinction between two subject positions above T. These developments cause ME to move towards a system of the type found in French, where the verb moves to a high inflectional head (T) and the subject occupies the specifier position of that head (SpecTP). SAdvV order therefore becomes less and less common. The low point of this development is reached in the middle of the 15th century with a frequency of 8.5% of SAdvV. Since this frequency is still not entirely negligible at this point, language learners maintain SAdvV in their grammar by postulating a residue of the second OE option mentioned above. The main difference is that the role of the high adverb position is extended as it now also attracts adverbs other than discourse particles. However, given that there is no independent motivation for adverb fronting apart from the fact that it maintains a word order that occurs in the language learner's input and given that the higher subject position is in decline, the structure deriving SAdvV becomes marginal (cf. Haeberli and Ihsane (2016:509f., 532) for details).

After the middle of the 15th century, the downward trend with respect to SAdvV is inverted, and the frequency of SAdvV rises from 8.5% to 37.3% within about half a century.

[9] The assumption that there are two subject positions above the lowest V-movement position is in line with much of the recent literature on OE. As the higher position is typically occupied by subject pronouns, some authors propose that this variation is driven by discourse factors: The high position hosts discourse-given subjects whereas non-given ones occur in the lower subject position (e.g. van Kemenade 2012).

In the following periods, we can observe some minor variation but the overall effect is stability (37.3% SAdvV for 1500-1525, 39.8% SAdvV for 1625-1650). As shown in Haeberli and Ihsane (2016), the short phase of increase of SAdvV order at the end of the 15th century signals the loss of V-movement past adverbs. At the end of this phase, the verb still moves to an inflectional head above negation (hence the predominance of SV*not* order in negative clauses), but movement across adverbs to the high heads T and M is lost.

3.2. *Modals and the distribution of adverbs*

Let us now consider modals. According to Lightfoot's hypothesis that main verbs and modals are categorically identical in OE and ME, we would expect the two to have the same properties with respect to V-movement and the quantitative development of adverb placement with modals to follow the pattern of main verbs in ME. Furthermore, if the dating of the recategorization of modals is correct, the separate developments should start at the beginning of the 16th century. These developments could also be captured by Warner's analysis under the assumption that it is the basic-level category that determines movement. However, if the diachronic path of adverb placement with modals is substantially different before 1500 already, Warner's approach would be supported as it is only in his analysis that modals can be distinguished syntactically before 1500.

3.2.1. Modals and adverbs: Quantitative data

For our quantitative analysis of adverb placement with modals, we distinguish three word order patterns: SAdvMV, SMAdvV, and SMVAdv.[10] These are illustrated in (5) to (7).

[10] Again, these labels refer to the relative order of the four elements, but additional constituents, including a non-finite auxiliary, may occur elsewhere within the clause. Cf. also fn. 5 above.

Covered by our counts are nearly all elements labelled as modals in the parsed corpora such as *can*, *could*, *may*, *might*, *must*, *mot*, *shall*, *should*, *will*, *would*, as well as modal uses of *dare* and *need*. The only exception is

(5) *SAdvMV*

a. And I *always* **schall** be yowre herault (PASTON,I,397.129.3924; 1467)

And I always shall be your herald

'And I shall always be your herald'

b. as ye *hiere* **may** see (CMREYNAR,8.66; 1481)

as you here may see

'… as you may see here'

(6) *SMAdvV*

a. and that ye **shall** *well* vnderstand (PASTON,I,145.039.987; 1465)

and that you shall well understand

'and you shall understand that well'

b. but he **wolde** *nevyr* cope whithe no man (CMGREGOR,219.2122; c1475)

but he wanted never engage in combat with no man

'but he never wanted to engage in combat with any man'

(7) *SMVAdv*

a. they **shall** dwell *there*, (PASTON,I,461.144.4497; 1473)

'they shall dwell there'

b. ȝyf þei **woldyn** receyuen hir *a-geyn* (CMKEMPE,65.1474; c1450)

if they wanted receive her again

'if they want to receive her again'

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ought, which we have left aside due to its distinct syntactic behaviour (selction of a *to*-infinitive rather than a bare infinitive).

To compare the data involving modals with those presented in Table 1 for main verbs, we will determine the frequency of SAdvMV order as opposed to SMAdvV and SMVAdv. The frequencies obtained in Table 1 are included in the last column of Table 2 below. If modals and main verbs behave identically with respect to adverb placement, we would expect the frequencies of SAdvMV and SAdvV to behave in similar ways.

TABLE 2 *The distribution of finite modals and adverbs following an overt subject in Old, Middle and Early Modern English (YCOE, PPCME2, PCEEC, PPCEME)*

Period	SAdvMV	SMAdvV	SMVAdv	Total	%SAdvMV	%SAdvV
1. OE	327	873	250	1450	22.6%	70.2%
2. 1150-1250	19	124	65	208	9.1%	38.2%
3. 1250-1350	2	34	40	76	2.6%	13.5%
4. 1350-1420	26	312	266	604	4.3%	9.9%
5. 1420-1475	10	419	484	913	1.1%	8.5%
6. 1475-1500	14	159	185	358	3.9%	16.5%
7. 1500-1525	4	177	114	295	1.4%	37.3%
8. 1525-1550	19	553	375	947	2.0%	33.9%
9. 1550-1575	28	453	316	797	3.5%	34.9%
10. 1575-1600	20	661	386	1067	1.9%	34.0%
11. 1600-1625	18	706	386	1110	1.6%	40.9%
12. 1625-1650	21	686	475	1182	1.8%	39.8%

The most striking aspect of the figures in the last two columns of Table 2 is that SAdvMV order is considerably less frequent than SAdvV in all the periods examined. At first sight, this contrast could be interpreted as meaning that from the earliest attested periods of English onwards modals move higher in the structure and therefore remain less often to the right of an adverb than main verbs. This would imply that a categorial difference between modals and main verbs must have existed in OE and ME already as, otherwise, the syntax could not make the necessary distinction with respect to which items are attracted to a higher head and which remain lower. However, such a conclusion is too hasty. Although an analysis in terms of a categorial distinction would provide a simple explanation of the quantitative

differences shown in Table 2, it is by no means the only possible way to account for them. In the following subsection we present some alternatives.

3.2.2. Accounting for the frequency differences between modals and main verbs

A first observation that is relevant in connection with the contrasts shown in Table 2 is that clauses involving modals differ from those involving finite main verbs in an important way with respect to how adverb placement can be analyzed. If we assume that modals are of the category V in early English and, furthermore, that non-finite verbs have their own functional structure, we must conclude, as Roberts and Roussou (2003) do, that a sentence like (8a) has a structure as given in (8b) (from Roberts and Roussou 2003:40).[11]

(8) a. Sone hit mæi ilimpen
Soon it may happen

b. [$_{TP}$ Sone [$_{TP}$ hit mæi [$_{VP}$ $t_{mæi}$ [$_{TP}$ T [$_{VP}$ ilimpen]]]]]

With a biclausal structure like (8b), adverbial modification can occur in two domains, either in the lower clause or in the higher clause. This gives rise to potential structural ambiguities with word orders of the type SMAdvV in early English as shown in (9).

(9) a. [$_{TP}$ *SU modal AdvP* [$_{VP}$ t_{modal} [$_{TP}$ T [$_{VP}$ *V*]]]]

b. [$_{TP}$ *SU modal* [$_{VP}$ t_{modal} [$_{TP}$ T *AdvP* [$_{VP}$ *V*]]]]

[11] The structures in the following examples leave aside additional inflectional heads that may occur between T and V. For our purposes here, the presence or absence of such additional heads is not essential. We will simply assume that the domain between TP and VP is a domain that can host adverbs.

In (9a), the order SMAdvV is derived through movement of the modal to T. Absence of movement would lead to SAdvMV. With a structure like (9b), however, SMAdvV is obtained regardless of whether the modal moves to T or whether it does not. The adverb always follows the modal. There are indeed many examples for which (9b) seems to be the most appropriate analysis.

(10) a. þt [$_{TP}$ ich **mote** [$_{VP}$ t_{mote} [$_{TP}$ T þe *trewoliche* [$_{VP}$ luuien]]]]

(CMJULIA,104.150; c1225)

that I might you truly love

'that I might truly love you'.

b. ðat [$_{TP}$ he **wile** [$_{VP}$ t_{wile} [$_{TP}$ T *ðar* mid ðe [$_{VP}$ wuniȝen]]]]

(CMVICES1,91.1086; a1225)

that he wants there with you live

'that he wants to live with you there.'

c. and [$_{TP}$ I **schal** [$_{VP}$ t_{schal} [$_{TP}$ T *aȝen* [$_{VP}$ reyse hym in the laste dai]]]]

(CMNTEST,VI,40.522; c1388)

'and I shall again raise him on the last day'

d. that [$_{TP}$ it **myghte** [$_{VP}$ t_{myghte} [$_{TP}$ T *greetly* [$_{VP}$ harme me]]]]

(CMCTMELI, 232.C2.597; c1380)

'that it might greatly harm me'

In all the examples in (10), as well as in (6a) above, the adverb is best interpreted as modifying the main verb rather than the modal. This suggests adverb attachment in the lower clause in a biclausal structure.

A plausible conclusion based on these observations would be that, due to the additional low adverb placement option, the occurrence of an adverb in the inflectional domain of finite modals is less common than the occurrence of an adverb in the inflectional domain of a finite main verb. The lower frequencies of SAdvMV compared to SAdvV could then simply be argued to be a manifestation of this contrast. As there are fewer instances of adverbs in the higher inflectional domain, there are also fewer instances of SAdvMV order.

The above considerations suggest that it is not legitimate to compare the frequencies in Table 2 directly to draw any conclusions as to the syntactic status of modals and main verbs. In order to do so, we would have to examine data that unambiguously identify movement of the finite element. For finite main verbs, evidence of this type can be found with (non-heavy) direct objects, as the order SVAdvO necessarily involves V-movement past the adverb. SVAdvO order can then be measured against SAdvVO order. As for modals, we would need all clauses in which the adverb modifies the modal and therefore merges in the higher clause. In such clauses, SMAdvV order must be derived, as in (9a), through movement of the modal from V to T in the periods when the modal is of the category V. If we then measure SMAdvV order against SAdvMV, we would have a frequency that should be more directly comparable to the main verb data. The problem with this method is that it does not seem to be possible to obtain exact data for the modals. This is because in many cases it can be difficult or impossible to conclusively determine whether the adverb is indeed in the higher clause or whether a low attachment would be possible as well. Consider for example the clause in (6b) (*but he wolde nevyr cope whithe no man*). Although our translation suggests that the adverb modifies the modal (*but he never wanted to engage in combat with any man*), the alternative option cannot be entirely excluded (*but he wanted to never engage in combat with any man*). Such uncertainties of interpretation make an exact measurement of high attachment impossible. Therefore, the method of comparison between modals and main verbs suggested

in this paragraph lacks precision as well. We thus conclude that simple comparisons of frequency figures of any kind do not allow us to evaluate whether modals and main verbs have the same syntactic status or not because semantic factors have an impact on the placement of the adverb as well.[12]

Besides the possible effects of the biclausal structure with modals, there is another factor that is likely to play a role in the frequency contrasts between SAdvMV and SAdvV order. As Table 2 shows, the contrast is already fully in place in the OE period. SAdvMV is a clear minority option whereas SAdvV is very frequent. A plausible assumption to make then is that what follows in the ME period is simply a natural continuation of the OE situation, with SAdvV being maintained at a higher frequency level than SAdvMV throughout the decline of these word order options. As for the way language learners acquire this contextual distinction,

[12] An anonymous reviewer suggests that an analysis of clauses containing verbs other than modals that take an infinitival complement (e.g. control verbs) may shed some further light on the quantitative impact a biclausal structure has on the distribution of adverbs. However, it is not entirely clear what the predictions for such clauses would be. At first sight, one might expect the frequency of preverbal adverb placement to be identical in both biclausal contexts. However, in light of the discussion in the text, the frequencies could also be different if the likelihood with which a modal is semantically modified by an adverb is different from that for other verbs taking an infinitival complement. Given the much more constrained semantics of modals compared to other lexical verbs selecting a non-finite clause, a difference would indeed not be entirely surprising.

An analysis of clauses with a non-modal verb taking an infinitival complement in our corpora in the period up to 1500 (i.e. when modals change their categorial status, cf. section 3.2.3 below) gives the following results: The order SAdvV is systematically less frequent with lexical verbs taking an infinitival complement than with other lexical verbs. This would support the claim that the increase in the number of possible adverb positions with a biclausal structure leads to a reduction of adverb placement before the finite verb. However, the frequencies of SAdvV with lexical verbs are not as low as for SAdvMV with modals. Given the observations made above, this contrast could be related to a higher likelihood of adverbial modification of lexical matrix verbs as compared to modals.

the syntactic environment alone (non-finite complementation with biclausal structure with modals but not (or at least not systematically) with main verbs) could be argued to be sufficient, and a categorial distinction between modals and main verbs would therefore not be necessary.

But if the situation in OE is crucial for the subsequent diachronic developments, the question we have to address is why there is such an important quantitative contrast between main verbs and modals with respect to adverb placement in OE in the first place. Although the structural aspects discussed above (additional adjunct position(s) due to biclausal structure) are relevant here as well, there is an additional factor that can be identified specifically for OE. In OE, there is an important difference between the way SAdvV is derived and the way SAdvMV is derived. As pointed out earlier, there are two possible options to obtain SAdvV order in OE: either through head-final structure, a very frequent option in particular in OE subordinate clauses, or through high adverb placement above a head-initial TP, a less frequent option. The latter option is also available for SAdvMV order. Head-final structure, however, does generally not lead to SAdvMV order but to SAdvVM order. SAdvMV is only possible if the non-finite main verb undergoes rightward movement (Verb Raising, Verb Projection Raising). Although such movement can indeed be found in OE, it is a minority option (cf. Haeberli and Pintzuk 2012). Thus, the contribution of head-final structure to the two word orders we are interested in differs considerably. While only a small part of the head-final clauses gives rise to SAdvMV order in Table 2, most clauses of this type contribute to the total number of SAdvV orders in Table 1.[13] This contrast can then be argued to be, at least partly, responsible for the observed frequency differences between

[13] Adverb extraposition may sometimes lead to SVAdv order despite underlying head-final structure. We assume here that this option is a marginal one and that in the large majority of cases, the adverb occurs preverbally with a head-final structure.

the two contexts. If we add the clearly head-final order SAdvVM (570 cases) to the OE data in Table 2, we obtain a considerably higher frequency of adverb placement to the left of the modal. SAdvVM and SAdvMV together correspond to 44.4% of all clauses containing an adverb. This figure is still not quite as high as the frequency of SAdvV order (70.2%). This suggests that adverb placement in the lower clause in a biclausal structure contributes to the frequency contrast in OE as well.

Let us consider one final issue in connection with the systematic frequency differences between main verbs and modals in Table 2. An additional possibility to account at least partially for these is suggested by Roberts and Roussou (2003:43ff.). Based on some of the evidence discussed by Warner (1993), they propose that "at least some pre-modals may have started 'leaking' into the functional domain from much earlier than the sixteenth century" (2003:43). This could be considered as an intermediate position between Warner's and Lightfoot's. The systematic recategorization of modals may indeed have occurred in the 16th century, but before that some modals or some modals in certain uses may already have been reanalyzed as elements merged directly in the functional domain. Thus, the recategorization would have taken place in a gradual fashion. There is nothing in our data that would clearly go against such a hypothesis, and it could potentially provide an additional element towards the explanation of why SAdvV is considerably more frequent than SAdvMV, if we assume that insertion of a modal in a high position reduces the likelihood for an adverb to occur to its left. However, we also do not find any clear support for this proposal. Roberts and Roussou (2003:43) introduce the hypothesis of 'leakage' into the functional domain in connection with Warner's (1993:145, 186) observation that the modals *shall* and *mot* never seem to have occurred in a non-finite form in OE and ME. A plausible assumption to make then would be that these modals have always been directly merged in T in (9) rather than under V. Assuming

that this is correct, one may wonder whether this property had an impact on the distributional properties with respect to adverbs.

To examine this question, we will have to focus on *shall* as *mot* occurs only rarely in our data. Similar limitations hold for the modals with which we can compare the properties of *shall*. Only *may* and *will* occur with substantial numbers in each of the early periods. In Table 3, we compare the numbers of occurrences of SAdvMV and SMAdvV order with the three modals *may*, *shall* and *will* (and their different forms including *might*, *should*, *would*) in the different periods of ME.

TABLE 3 *The distribution of* may*,* shall*, and* will *and adverbs between an overt subject and the main verb in Middle English (PPCME2, PPCEME)*

Period	***may***			***shall***			***will***		
	SAMV	SMAV	%SAMV	SAMV	SMAV	%SAMV	SAMV	SMAV	%SAMV
2. 1150-1250	8	28	22.2%	4	50	7.4%	5	24	17.2%
3. 1250-1350	0	7	0.0%	0	20	0.0%	1	3	25.0%
4. 1350-1420	8	99	7.5%	14	124	10.1%	3	58	4.9%
5. 1420-1475	3	67	4.3%	4	178	2.2%	1	93	1.1%
6. 1475-1500	6	27	18.2%	3	55	5.2%	4	51	7.3%

At first sight, there do not seem to be any substantial differences between individual modals with respect to adverb placement. A closer statistical analysis confirms this initial impression. If, for each period, we compare *may* and *shall* on the one hand and *shall* and *will* on the other, we obtain only one statistically significant difference among the 10 possible cases. In the period 1150-1250, *may* has a significantly higher frequency of SAdvMV order than *shall* (one-tailed Fisher's exact test, $p = 0.045$). All the other comparisons yield results that are statistically not significant. There is therefore no clear evidence in our data suggesting that *shall* behaves differently from *may* and *will* with respect to adverb placement.[14] This

[14] In terms of the analysis proposed in Haeberli and Ihsane (2016), this result would not be unexpected, even if Roberts and Roussou's hypothesis of some 'leakage' into the functional domain before the 16th century were

conclusion is confirmed if we collapse all the data from Table 3 for the period 1150-1500. Whereas *shall* and *will* pattern almost alike (5.5% SAMV for *shall*, 5.8% SAMV for *will*), it is *may*, rather than *shall*, that has the highest rate of SAMV order (9.9%).

3.2.3. Diachronic developments

So far, our discussion of the results in Table 2 has focused on the frequency differences between modals and main verbs, and we have seen that they are not necessarily signs of a different categorial status of the two elements in early English. To conclude our discussion, let us turn to another aspect of the data shown in Table 2, namely the diachronic trajectories of the two contexts. Even if there are independent factors that influence the exact frequencies of SAdvV and SAdvMV, one would nevertheless expect the two contexts to develop identically over time if main verbs and modals were of the same syntactic category. On the other hand, if they were categorially distinct, the diachronic developments could be independent of each other.

As pointed out in our discussion of Table 1, SAdvV order steadily declines from OE to late ME, reaching its lowest point in the period 1420-1475. After that, SAdvV order rapidly increases again within approximately half a century before reaching a certain stability. As for SAdvMV order in Table 2, it declines after OE and reaches a first low point in the period 1250-1350 with 2.6%. There is then a small rise to 4.3% in 1350-1420, and a decline back again to 1.1% in 1420-1475. This pattern can be considered as paralleling that of main verbs. The low point with SAdvMV in the period 1250-1350 is unlikely to be significant for two reasons. On the one hand, the evidence for this period in the PPCME2 is somewhat

correct. Our proposal is that, until the middle of the 15th century, finite main verbs generally do not occur below the highest inflectional head (T) and preverbal adverbs move to a position above TP. Thus, even if some modals were inserted directly in the inflectional domain, they would not be expected to occur higher in the structure and therefore to be more likely to precede adverbs than finite main verbs.

problematic as it is very restricted and only consists of two texts of a substantial size for the entire period. On the other hand, the rise from period 1250-1350 to period 1350-1420 is not significant (Fisher's exact test, $p > 0.5$). This suggests that the period 1250-1350 does not clearly fall outside a downward trajectory that starts after OE and reaches its lowest point in the period 1420-1475, the decline from 1350-1420 to 1420-1475 being highly significant (chi-square = 16.16, $p < 0.0001$). The parallelism between main verbs and modals then continues in the period 1475-1500. We can observe a significant increase of SAdvV order (chi-square = 36.35, $p < 0.001$) as well as a significant increase of SAdvMV (chi-square = 11.00, $p < 0.001$). As discussed earlier, the increase in SAdvV order is a manifestation of the decline of V-movement. The fact that SAdvMV increases in parallel suggests that the beginning of the decline of V-movement affects both modals and main verbs and that therefore the two types of elements are not categorially distinguished, at least with respect to this aspect of the syntax. Hence, our data are compatible both with Warner's and Lightfoot's approaches, as both treat modals as belonging to the same main syntactic category V up to around 1500.

After 1500, main verbs and modals take different diachronic paths. SAdvV order again increases in a highly significant way in period 1500-1525 (chi-square = 73.08, $p < 0.001$). This can be considered as a consequence of the further decline of V-movement. As for SAdvMV order, its frequency stops rising and declines instead. The decline from period 1475-1500 to 1500-1525 is borderline significant (chi-square = 3.94, $p = 0.047$). But one text sample alone (John Fisher's sermons) contains 3 out of the 4 cases of SAdvMV for the period 1500-1525, and if that text were left aside, the decline would be much more clearly significant (chi-square = 8.27, $p < 0.005$).[15] The weakness of SAdvMV in this period can plausibly be analyzed in terms of the categorial reanalysis of modals. As modals are no longer members of

[15] The raw figures for period 1500-1525 without John Fisher's sermons are as follows: SAdvMV: 1 ; SMAdvV: 162; SMVAdv: 107.

the category V, the decline of V-movement does not affect their distribution any more. Instead modals are now merged directly in the inflectional domain, either in a position which is to the left of adverbs or from which they can move to the left of adverbs.[16] Thus, by identifying the beginning of the 16th century as the period when main verbs and modals start having clearly distinct diachronic trajectories with respect to adverb placement, the data in Table 2 confirm the dating of the recategorization of modals proposed in the earlier literature on the basis of novel and entirely independent evidence.

4. CONCLUSIONS

The history of English modals has been discussed extensively in the diachronic literature. In this paper, we have presented new data with the aim of evaluating certain proposals made in earlier work. Our focus has been on two accounts of English modals, one by Lightfoot (1979, 1999, 2006) and one by Warner (1993). Both accounts agree that modals undergo a categorial change at the beginning of the 16th century. What distinguishes them is that for Lightfoot the change consists of a radical reanalysis from V to I whereas for Warner the change is more gradual in that early English modals, although being fundamentally verbal, are already categorially distinct from regular main verbs at a subordinate level and they then develop into a entirely separate category later. Focusing on the history of V-movement in English and, more specifically, the distributional properties of modals and main verbs with respect to adverbs, we have examined whether there is evidence for a categorically distinct status of modals in early English or not.

[16] The fact that SAdvMV order can still be derived beyond 1500 suggests that, at least in some contexts, the second option must be available as instances of that order could be analyzed as structures lacking movement of the modal.

Three main observations can be made on the basis of our quantitative analysis of adverb placement. First, there are considerable frequency differences throughout early English between SAdvV order and SAdvMV order. Secondly, the overall diachronic trajectories of main verbs and modals are identical up to the recategorization of the modals. Third, our data provide new and entirely independent evidence for the dating of the recategorization in the early 16th century. Whereas the second and the third findings are entirely compatible with Lightfoot's position, the first one seems to be problematic at first sight. However, we have shown that the frequency differences between main verbs and modals can be related to factors that are independent of the categorial status of the two elements, namely additional adjunct placement options with modals due to the biclausal structure they occur in, and the general clausal syntax in OE which favours SAdvV as compared to SAdvMV. We therefore conclude that adverb placement and, hence, V-movement do not provide any evidence against Lightfoot's hypothesis that modals and main verbs are categorially fully identical in the early history of English. However, given that in Warner's analysis main verbs and modals share their basic-level category (i.e. V) but are distinct at the subordinate level, our findings can also be made compatible with this alternative approach under the assumption that it is the basic-level categorial feature that drives movement past adverbs in early English. Conclusive evidence in favour of one approach or the other must therefore be found outside the syntax of V-movement.

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