

WORD ORDER CHANGE, ARCHITECTURE, AND
INTERFACES: EVIDENCE FROM THE DEVELOPMENT
OF V TO C MOVEMENT IN THE HISTORY OF
ENGLISH*

ANS VAN KEMENADE
Radboud University Nijmegen

ROLAND HINTERHÖLZL
Ca' Foscari University of Venice

TARA STRUIK
University of Mannheim

ABSTRACT We present a novel account of the development and loss of one type of V2 word order over the Middle and early Modern English periods, based on a fine-grained corpus study which shows that multiple factors are at play, in interaction between syntax, information structure and prosody. We focus on finite verb movement to the highest functional head in the C-domain (Force) of the main clause: subject-finite inversion with pronominal subjects following an initial adverb (*þa*, *þonne*) in Old English. Middle English first sees the extension of this V2-context to other initial short deictic adverbs: *here*, *there*, *nu*, *yet* and *thus*. The choice of verb is narrowed down to auxiliaries and monosyllabic lexical verbs. V2 following adverbs is subsequently lost over the early Modern period. We show that this loss coincides with the grammaticalization of modals and other auxiliaries, leading to the loss of primary stress on the auxiliary. This triggered metrical changes in the clause-initial prosodic word: as long as the unstressed initial adverb could co-occur with a stressed monosyllabic finite verb, and the post-verbal subject pronoun could be integrated into the prosodic word of the auxiliary, inversion flourished. The loss of primary stress on the auxiliary yielded an unheaded foot, violating prosodic requirements. Our multifactorial treatment of the development and loss of V2 implies that the process we find is best treated in terms of micro-variation.

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1 INTRODUCTION AND BACKGROUND

Previous research on V2 in the history of English has established that V2 was never a unitary phenomenon. Even within the most robust V2 environments in Old and Middle English (OE (pre-1100), ME (1100-1500)) where V2 inversion is 1) categorical, 2) restricted to main clauses, as is characteristic of most of the other Germanic languages past and present, it is restricted to specific types of first constituent, viz. questions (1a-b), negative-initial clauses (1c-d), clauses introduced by one of two temporal adverbs *þa* or *þonne* (1e-f) both meaning ‘then’. These contexts show near-categorical inversion of subject and finite verb (Vf), both with pronominal and nominal subjects.

- (1) a. *Hwi wolde God swa lytles þinges him forwyrnan*
 Why would God so small a thing him deny
 ‘Why should God deny him such a small thing?’
 (ÆCHom I, 1.14.2)
- b. *and clypode to ðam wife, To hwi swincst þu, la*
 and called to the woman, to why work you, oh
wif?
 woman?
 ‘And cried to the woman. Wherefore labourest thou, oh
 woman?’
 (ÆLS_[Basil]:657.923)
- c. *Ne bið seo synfulle sawul na mid ealle to nahte*
 Not is the sinful soul not with all to nought
awend, ...
 turned, ...
 ‘The sinful soul will not be wholly turned to naught, ...’
 (ÆCHom_I_10:263)
- d. *Ne sceal he naht unaliefedes don*
 not shall he nothing unlawful do
 ‘He shall not do anything unlawful’
 (CP 10.61.14)
- e. *Þa wæs þæt folc þæs micclan welan ungemetlice*
 Then was the people the great prosperity excessively
brucende, ...
 partaking
 ‘Then the people were partaking excessively of the great
 prosperity’
 (Or 1:3.23.3.451)

- f. *thonne sceole we huru widhstandan.*
then should we at least withstand
'then we should at least withstand'

(ÆCHom_I, 11:271)

Note that the finite verb in (1) can be lexical or a (pre-)auxiliary in Old English. In present-day English, questions and negative-initial clauses still have the V2 property, except that it is entirely restricted to contexts with auxiliaries (as in 2-3). Negative-initial clauses (3a-b) show an apparent degree of continuity from Old to present-day English, except that Old English *ne* is an unstressed proclitic element, whereas initial negatives in present-day English V2 clauses have a special pragmatic (exclamatory) function, as in (3b). Wallage (2012) gives a detailed analysis of their negative features.

- (2) a. **Why** would she deny him such a small thing?
b. ***Why** denies she him such a small thing?
- (3) a. **Never** would I do such a thing!
b. ***Never** do I such a thing!

Inversion following *then* (1e-f) underwent a complex set of changes over the ME period and was lost over the early Modern English period. This paper analyses the multifactorial processes of change leading to its loss.

There is a second type of V2 word order in Old English, which is often an alternation between V2 and V3 word order. Some examples are given in (4). Verb fronting here is dominant in main clauses, but not restricted to them. The trigger for verb fronting is also less clear. This type shows more diversity as determined by several factors: whether the first constituent refers back to the context (see Los 2009, Los & Dreschler 2012, Bech & Eide 2014), whether the subject is nominal (4a-b), mostly but not always inversion) or pronominal ((4b), very dominantly non-inversion, see van Kemenade 1987, 2012, Pintzuk 1991). Bech (2000) makes a case that non-inversion is dominated by discourse-given subjects.

- (4) a. *On twam þingum hæfde God þæs mannes sawle gegodod*
in two things had God the man's soul endowed
'God had endowed man's soul with two things'

(ÆCHom I, 1.20.1)

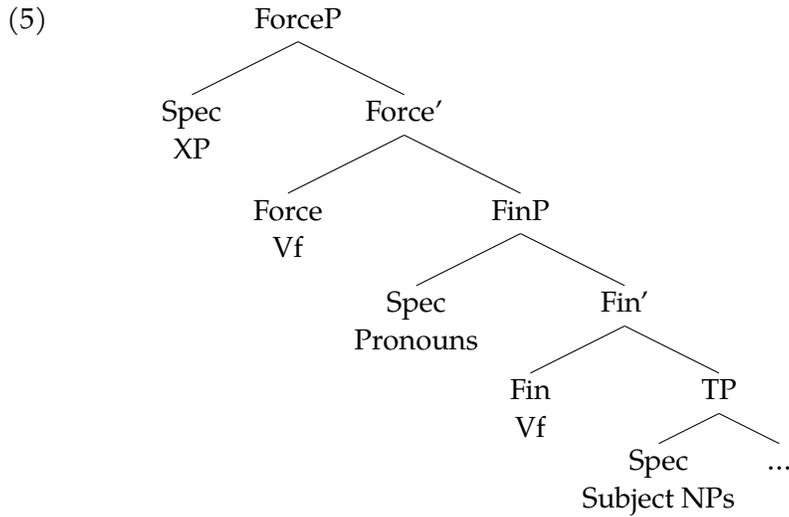
- b. *Æfter Godes gesetnysse ealle cristene men sceoldon*
 after God's law all christian men should
beon swa geþwære
 be so united
 'According to the law of God all Christian men should be so
 united'
 (ÆCHom_I,19:333)
- c. *Forðon we sceolan mid ealle mod & mægene to*
 Therefore we must with all mind and power to
Gode gecyrran
 God turn
 'Therefore we must turn to God with all our mind and power'
 (HomU19 (BIHom 8) 26)

The type of Vf plays a role as well: inversion of nominal subjects is more frequent when Vf is unaccusative, (see [van Kemenade 1997](#), [Warner 2007](#), [Biberauer & van Kemenade 2011](#)).¹ Earlier work by [van Kemenade \(1987\)](#) and by [Pintzuk \(1991\)](#) accounts for the differential position of nominal and pronominal subjects with respect to the finite verb in terms of cliticization of pronominal subjects. [Haeberli \(2002\)](#) was the first to treat this systematically in a more articulate structure with hierarchically separate positions for pronominal subjects (Spec,AgrSP) and nominal subjects (Spec,TP), see also [Warner \(2007\)](#), [van Kemenade \(2012\)](#). [Walkden \(2017\)](#) approaches this and the V2/V3 alternation in some other West-Germanic varieties in terms of Rizzi's (1997) Force/Fin model, which we also adopt here. Our starting point is the following structure for Old English:

¹ We distinguish three finite verb types (cf. [van Kemenade 2012](#)), for which verb forms have been coded manually in the PPCME and PCCEME corpora used here:

- i. Auxiliaries (modals, *have* and *be*)
- ii. Unaccusative verbs
- iii. Transitive verbs and unergative intransitive verbs.

The distinction between unaccusative verbs and transitive/unergative intransitive verbs is relevant here primarily because of the large number of examples with copula BE, which is very often monosyllabic, i.e. prosodically light.



Type 1 V2 as discussed above involves V-movement to Force; type 2 involves V movement to Fin. The initial XP is in Spec,ForceP. We will come back to this in Section 5. There is a left-peripheral subject position, Spec.FinP, for pronominal subjects. This high (preverbal) position may also be relevant for discourse-given nominal subjects (following up on Bech’s 2000 observations), but this has so far not been investigated systematically on a larger corpus. Spec,T is a second and lower postverbal subject position for nominal subjects. Dey & Sakas (2023) find no generalization underlying the preference for preverbal and postverbal position for nominal subjects. We leave this matter for further research.

The focus of this article is on type 1 inversion as in (1): V to Force movement. We restrict our focus here to type 1 constructions with pronominal subjects only. The key argument for this is that, given the multiple variation factors over the ME period that we will show below, we must narrow down the context to specific diagnostic environments. Inversion of pronominal subjects is the only such context. When XP, Vf and subject are in adjacent positions in the high left periphery, the Vf position on the left of the pronominal subject shows that it must be in Force. This is less clear in the case of inversion of nominal subjects, where the subject may be in either position. The sequence XP-Vf-subject NP may thus represent XP in Spec,Force, and Vf in Force or Fin. Even if V to Force movement is (near-) categorical in V2 constructions with nominal subjects, it is still unclear what the position of the nominal subject is: it could be in Spec,FinP or in Spec,TP.² An inverted pronominal subject

² An anonymous reviewer points out, referring to Weiß (2018), that this conclusion does not hold for German (including OHG where subject-verb inversion is taken to involve V movement to Fin0). We assume that discourse-given nominal subjects and pronouns move to [Spec,FinP].

is always immediately adjacent to the finite verb, unlike an inverted nominal subject, which may be separated from the finite verb, e.g. by a discourse particle. The following contrast shows this:

- (6) a. *Hu gerades mæg ðonne se biscep brucan ðære*
 how properly may PRT the bishop enjoy the
hirdelican are, ...
 pastoral dignity ...
 ‘How, then, can the bishop properly enjoy the pastoral dignity?’
 (CP:18.133.3.898)
- b. *Hwi ne sceal he þonne rihtlice wrecan þæt yfel ðæt he*
 Why not shall he PRT justly avenge that evil that he
onscunað.
 abominates.
 ‘Why then should he not justly avenge that evil which he
 abominates?’
 (ÆCHom_I_7:237)

(6) presents examples of questions in which *þonne* ‘then’ is used as a discourse particle (cf. van Kemenade & Links 2020, following Coniglio 2011, Bayer 2012 for German). The structural position of this particle can safely be assumed to be between FinP and TP in the structure (5): the pronominal subject precedes it (6b); the nominal subject follows it (6a). Inverted nominal subjects can thus be separated from Vf, pronominal subjects cannot.

Determining the position of nominal subjects is further complicated in unaccusative constructions, where they can occupy low positions in the clause, as in (7) (van Kemenade 1997, Biberauer & van Kemenade 2011, Dreschler 2015). In (7a) the inverted nominal subject is separated from the fronted finite verb by an adverb, and in (7b) it follows the non-finite verb:

- (7) a. *Forðon is soðlice se cwide gefylled Dauides ðæs*
 Because is truly the prophecy fulfilled of David the
witgan
 prophet
 ‘For verily is the prophecy of the prophet David fulfilled’
 (BlHom_13:139.40)
- b. *Her sind hrædlice gesæde micale Godes wundra.*
 Here are quickly said great of God miracles
 ‘Here great wonders of God are quickly said’
 (ÆCHom_II_3:21)

Subject pronouns are then licensed by head movement to Force⁹ in OE and Early ME.

Constructions such as those in (7) are by no means rare, which means that the position of nominal subjects requires special consideration. We therefore leave inversion of nominal subjects for further research and concentrate on Type 1 V2 constructions with a pronominal subject only, ensuring maximally clear diagnostics.

The purpose of this article is to analyse in detail the ME and early Modern English development, building on [van Kemenade \(2012\)](#), [Hinterhölzl & van Kemenade \(2012\)](#), [van Kemenade & Westergaard \(2012\)](#). The key characteristic of type 1 is the importance of the first constituent in triggering V2: it is mostly restricted to questions, negative particles and *þa/þonne* ‘then’. We will come back to this in Section 5. The choice of Vf type does not appear to play a role in type 1 V2 in Old English. In Middle English type 1 inversion is increasingly triggered by short deictic adverbs, and at the same time is increasingly restricted to auxiliaries and monosyllabic lexical verbs, as we will see. We focus on inversion following initial adverbs, which allows us to contrast the development of inversion following *then*, which was near-categorical in Old English, with that of other adverbs, which showed very low rates of inversion in Old English.³ We then go on to address in detail the Middle English development, showing that the development of type 1 V2 following adverbs interacts with the prosodic status of the finite verb: rates of inversion increase when Vf is prosodically light: pre-auxiliaries or monosyllabic lexical verbs. This development reflects the grammaticalization of auxiliaries that was ongoing. Type 1 V2 following adverbs was lost once auxiliaries were reanalysed as functional heads, from the first half of the 16th century. As is well-established in the work of [Roberts \(1985, 1993\)](#), [Kroch \(1989\)](#), [Warner \(1997\)](#), this reanalysis process went hand in hand with the loss of verb movement of lexical finite verbs, so that this type of V2 was lost for lexical verbs as well. These are related but independent developments: while type 1 V2 became restricted to auxiliaries in questions and focal negative-initial clauses as in (2-3), it was lost altogether in contexts following adverbs. A key distinction between these contexts is stress on the first constituent: questions and focal negative-initial clauses carry primary stress on the first constituent, as in (2-3), short deictic adverbs could but mostly did not carry primary stress. Both contexts could induce inversion as long as the finite verb carried primary stress. We argue that the reanalysis of auxiliaries as functional heads resulted in the loss of their ability to carry primary stress. This led to the loss of inversion following adverbs, as the resulting initial prosodic foot consisted of three unstressed syllables, violating metrical requirements. This change did not af-

³ Type 1 inversion also occurs on a smaller scale following the short adverbs *nu* ‘now’, *so* ‘so’. We will come back to this below.

fect lexical verbs, whether monosyllabic or not. However, verb movement of lexical verbs was lost across the board during the same period (see most recently [Haeberli & Ihsane 2016](#)), with repercussions across the grammar, such as the rise of *do*-support (see primarily [Warner 1993, 2006, 2007](#)).

The paper is organised as follows. Sections 2 and 3 will identify the multiple factors that played a role in the development and loss of type 1 V2: the weight of XP, Vf as well as subject pronoun; the change in status of the initial adverb from operator to discourse linker; the increasing importance over the late ME period of stress/focus on the first constituent to ‘preserve’ inversion. Section 4 pulls together the factors involved and tests their significance by means of a logistic regression analysis for each of the sufficiently documented subperiods of ME and EME. Section 5 presents a theoretical account of the historical development in terms of the interaction between syntax and prosody, which ties together the novel empirical connections brought up in sections 2, 3 and 4. Section 6 concludes.

2 THEN AND OTHER ADVERBS

Our starting point is that *then* (including *þa* and *þonne*) triggered near-categorical inversion of pronominal subjects in Old English, a secure diagnostic that type 1 V2 involves V-movement to Force in the structure (5). We first consider the quantitative evidence for this. Anticipating the discussion on ME below, we distinguish between auxiliaries and lexical verbs. Table 1 contrasts two contexts for V2 in OE: clauses introduced by *þa/þonne* (V to Force movement) and clauses introduced by another adverb (V to Fin movement). This picture is given in Table 1 for the subperiods O2 and O3 in the *York Corpus of Old English* ([Taylor, Warner, Pintzuk & Beths 2003](#)). The O4 period was left out because its text material is generally regarded as a less reliable witness of the language of its time, as the manuscripts are copies, translations, adaptations, combine sources etc.

Table 1 shows a stable picture for Old English: clauses introduced by *þa/þonne* show Type 1 V2 with a pronominal subject at rates of over 90%; those introduced by another adverb show inversion of a pronominal subject at rates below 10%, implying that Type 2 V2 (no inversion of pronominal subjects) is the norm there. In both cases, the distinction in frequency of inversion between Vf types is small. The OE roots of inversion following an adverb like *then* in (1c) can thus be regarded as robust.

The question is what it is that strongly distinguishes the precursors of *then* from other initial adverbs that primarily *then* adverbs trigger V to Force movement at very high rates. [van Kemenade \(1987\)](#) suggests that *then* is a “discourse operator”: it marks discourse sequencing and behaves like a syn-

	Then (<i>þa/þonne</i>)				AdvO (other adverbs)			
	Inv	NoInv	Total	%Inv	Inv	NoInv	Total	%Inv
O2								
Aux	243	16	259	93.8%	18	167	185	9.7%
Lexical V	1067	73	1140	93.6%	48	487	535	9.0%
O3								
Aux	269	16	185	94.4%	23	212	235	9.8%
Lexical V	1980	102	2082	95.1%	85	1109	1194	7.1%

Table 1 Inversion of pronominal subject and finite verb following clause-initial *then* vs. other adverbs in the periods O2 (750-850) and O3 (850-950)

tactic logical operator on a par with *wh*-operators and negative operators in triggering V to Force movement.⁴ *þa* and *þonne* are multifunctional elements in OE, but the property that ties these various uses together is deixis, which is expressed in OE by demonstrative pronouns (the *se* paradigm of demonstrative pronouns and determiners), and by an etymologically related set of time, place and manner adverbs (*þa* ‘then’, *þonne* ‘then’, *þær* ‘there’, *þus* ‘thus’, *swa* ‘so’, *swylc* ‘such’). These most typically occur in clause-initial position (Los & van Kemenade 2018). *þa* and *þonne* are temporal adverbs, and their deictic character makes them suitable for discourse-sequencing via the clause-initial position. As elements in first position, they are often grammaticalized as complementizers, marking subordination.⁵ Another grammaticalized use is that of discourse particles.⁶ Examples that feature all three of these uses are given in (8) (from van Kemenade & Links 2020):

- (8) a. *þa*₁ he *þa*₃ in *þæt ealond cwom*, *þa*₂ *getimbrede* he
 When he then in that island came, then built he
þær mynster
 there monastery

⁴ The category AdvO for OE excludes adverbs like *nu* and *so*, which come to play a more extensive role in triggering type 1 inversion in Middle English. We will come back to this below.

⁵ An anonymous reviewer points out that similar considerations apply to the cognate word *textitda* (‘then’, ‘here’) in German, as is discussed at some length in Axel-Tober (2012). Another possible grammaticalization of clause-initial *textitda* in German was the development into an expletive (comparable to Engl. ‘there’) in OHG, cf. Fuß & Hinterhölzl (2023).

⁶ German dialectal *denn* ‘then’ was grammaticalized as a marker of *wh*-questions. In some dialects, like North Eastern Bavarian, the particle is obligatory in questions, cf. Weiß (2013).

‘On coming to that island, he erected a monastery there.’

(Bede_4:4.272.28.2779)

- b. *þonne₁ hio þonne₃ ymbe hire scippend smeað, þonne₂ bið*
 When she then about her Creator thinks, then is
hio ofer hire selfre
 she above her self

‘When it thinks of its creator, then it is above itself.’

(Bo:33.81.29.1549)

- c. *Gif he ðonne₃ sie idæges dead, ðonne₂ sitte sio*
 If he then be the-same-day dead, then sit the
scyld on him
 guilt on him

‘If he should be dead that same day, the guilt rests on him.’

(LawAfEl:17.44)

The examples in (8) are correlative clauses: preposed (paratactic) adverbial and conditional clauses introduced by a complementizer (*þa₁ þonne₁* in (8a-b), *gif* in (8c)), and followed by a main clause, in which the preposed clause is often resumed by a resumptive adverb (*þa₂, þonne₂*). The adverbial clauses in (8) furthermore feature a discourse particle (*þa₃, þonne₃*), which van Kemenade & Links (2020) analyse as another grammaticalized function of the two adverbs, *þa* as an affirmative particle, *þonne* occurring more frequently in conditionals and other non-affirmative contexts (Links 2018). They allow the speaker/writer to refer to the context. These uses highlight the discourse-linking effect of the adverb but they are not limited to *þa* and *þonne*: they also occur with adverbs such as *nu* ‘now’ and *swa* ‘so’ which trigger type 1 V2 at some frequency, although to a more limited and variable extent than *then* adverbs, and with more diversification of meaning. We suggest that the high frequency of the multiple manifestation of the discourse-linking character in correlatives, and its anchor in the highest head in the left periphery, defines the “operator” character of *þa* and *þonne*. We will dub it a situation operator, linking the reference situation and the utterance situation.

The set of “other” adverbs is much more diverse, and they are not infrequently first followed by another element, e.g. negative *ne*, that is the actual trigger for V to Force movement. These have not been considered in detail here, as the overall figures in Table 1 above show that the rates of inversion are quite low.

3 MIDDLE ENGLISH AND THE LOSS OF TYPE 1 V2 IN THE TRANSITION TO EARLY MODERN ENGLISH

Middle English sees an extension of the type 1 V2 construction to clauses introduced by other adverbs, and this is increasingly restricted to contexts where the finite verb is an auxiliary or a monosyllabic lexical verb. We will first consider this generally, and then go into further detail. The data presented here are from the *Penn Helsinki Parsed Corpus of Middle English* (PPCME2, Kroch, Taylor & Santorini 2000a) and from the *Penn Helsinki Parsed Corpus of Early Modern English* (PPCEME, Kroch, Santorini & Delfs 2004). Appendix A details the text choices.

We first give a number of ME examples in (9) and (10):

(9) Inversion and non-inversion of pronominal subjects following *then*

- a. þenne schal hit wel faren.
then shall it well go

(ancriw-2, II.315.1132)

- b. Þanne it folowep in þe storie:
then it follows in the story

(polych,VI,463.3425)

(10) Inversion and non-inversion of pronominal subjects following *then*

- a. eaðe Macht þu pruden.
easily may you be pround

(ancriw-1, II.203.2906)

- b. And git I bid þee not pleynly hyde it
and yet I bid you not plainly hide it

(cloud, 89.523)

Tables 2 and 3 give the overall development over the Middle and early Modern periods. This is visualized in Figures 1 and 2.⁷ We see in tables 2 and 3 that there is considerable vacillation between periods in the amount of available data. In particular, the M2 period has only three texts to furnish data.

It is worth noting that the figures for the M1 period show some reduction of inversion rates compared to the OE period as in Table 1, with over 90% of

⁷ The periodization is as follows:

M1=1150-1250 M2=1250-1350 M3=1350-1420 M4=1420-1500
E1 = 1500-1569 E2 = 1570-1639 E3 = 1640-1710

		M1	M2	M3	M4	E1	E2	E3
Aux	N	18/27	9/13	84/122	92/153	84/148	17/163	4/114
	%	66,7%	69,2%	68,9%	60,1%	56,8%	10,4%	3,5%
Unacc	N	54/62	7/10	46/114	122/319	59/167	21/274	4/71
	%	87,1%	70,0%	40,4%	38,2%	35,3%	7,7%	5,6%
Tr/Unerg	N	18/21	9/13	67/134	134/169	80/160	34/306	10/112
	%	85,7%	69,2%	50,0%	28,6%	50,0%	11,1%	8,9%

Table 2 % of Inversion of pronoun subject following *Then*, per verb type

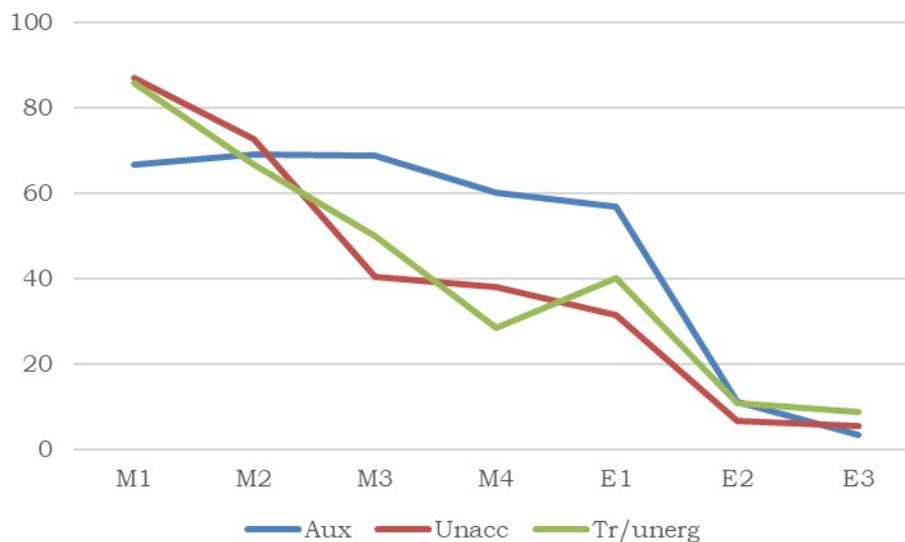


Figure 1 % of Inversion of pronoun subject following *Then*, per verb type

inversion. Two main factors are responsible for this: *þa* in its multifaceted uses was largely lost in the transition to ME. This was especially true for its (very frequent) complementizer and resumptive adverb functions, as discussed for correlatives in (8) above, and as the figures in (Links, van Kemenade & Grondelars 2017: 374) show: *þa* from 529 in O3 > 28 in M1; *þonne* (temporal + conditional) from 382 in O3 > 38 in M1.

Table 2 and Figure 1 show that initial *then* continued to trigger V2 at a rate of some 70% up to and including the M3 period (1350-1420), lowering gradually to some 55% over the next two periods M4 and E1 (1420-1570),

from then on declining rapidly. The inversion rate is systematically higher for (pre-) auxiliaries than for lexical verbs (from M2 onward).

		M1	M2	M3	M4	E1	E2	E3
Aux	N	5/80	2/15	99/331	122/298	85/383	35/360	8/288
	%	6,3%	13,3%	29,9%	40,9%	22,2%	9,7%	2,8%
Unacc	N	12/91	4/32	26/302	38/306	46/357	25/459	10/286
	%	13,2%	12,5%	8,6%	12,4%	12,9%	5,4%	3,5%
Tr/Unerg	N	7/142	1/30	32/343	44/476	30/407	15/484	1/246
	%	4,9%	3,3%	9,3%	9,2%	7,4%	3,1%	0,4%

Table 3 % Inversion of pronoun subject following Other Adverbs, per verb type

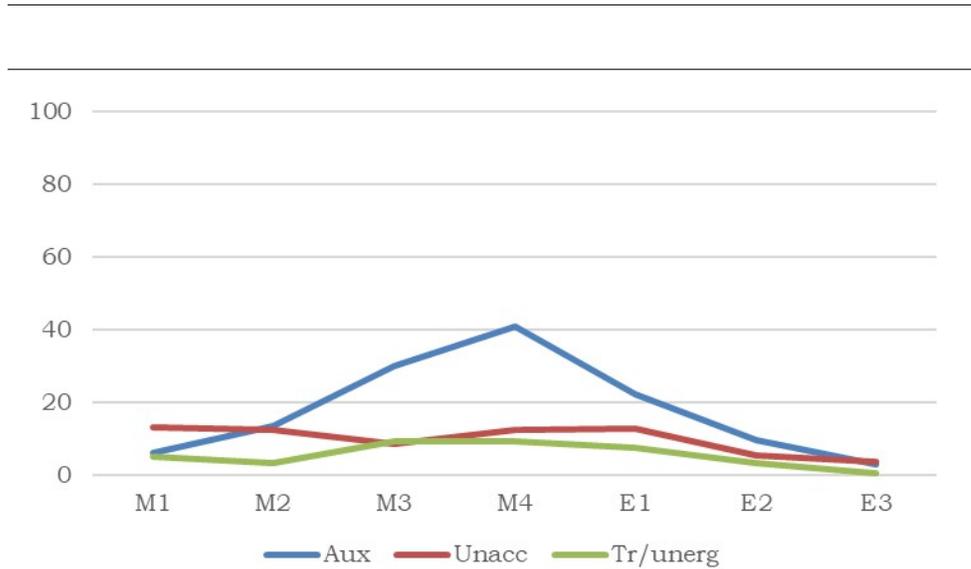


Figure 2 % of Inversion of pronoun subject following Other adverbs, per verb type

Table 3 and Figure 2 show a distinct peak in inversion following other adverbs that is especially prominent over the M3 and M4 periods, though still clear in the E1 period, but only when the finite verb is an auxiliary.

This general picture of the development thus shows two marked innovations in ME that create novel dimensions of variation: 1) the type 1 V2 pattern is extended to clauses introduced by adverbs other than *then*; 2) its frequency is substantially higher when the finite verb is an auxiliary. We will discuss these observations in the following subsections before we examine the data

in more detail.

3.1 *Then and other adverbs in Middle English*

The extension of subject pronoun inversion to contexts with adverbs other than *then* is not a random one. The other adverbs featuring at considerable frequency in the ME rise of inversion are the precursors of *here*, *there*, *thus*, *now*, *yet*, and *so* (see also [Jacobsson 1951](#): 87ff on early Modern English). As discussed in Section 2, most of them are deictic adverbs in clause-initial position, which did not trigger inversion of pronominal subjects in OE. *So* showed inversion in OE, like *then*, but less consistently, and diversified between various meanings. This is true also to a more limited extent for *now*. Inversion of pronominal subjects following *here*, *there*, *thus*, *now*, *yet* is a ME innovation. Inversion is not completely restricted to these adverbs in late ME, but none of the remaining ones shows inversion at any frequency.

What do these adverbs have in common with *then* as used in clause-initial position? First, *then* and the relevant other adverbs are native English adverbs – there is no question of Scandinavian (or indeed French) origin. Second, they are monosyllabic and, in all likelihood, weakly stressed in most cases, although they could be emphatic. Third, they are deictic, linking the clause to the context in a temporal sequence (*then*), location (*here*, *there*), conclusion (*thus*), contrast (*yet*), manner (*so*). Finally, *now* indicates the reference time of the context. They can thus be qualified as situation operators. This still raises the question why inversion in OE was so frequent following *then* adverbs and to a lesser extent *nu*, and why it was extended to these kindred deictic adverbs over the ME period. As discussed above, *þa* ‘then’ in its manifold uses was largely lost in the transition to ME, and its functions were largely (and gradually) taken over by *then* (originally *þonne*). Note that OE *þonne* was bisyllabic. Bisyllabic examples can still be found in early ME, but a monosyllabic form *then/than* is dominant by late ME times. Furthermore, adverbial resumption was drastically reduced in the transition to ME. This process plausibly involved semantic bleaching, as *þa* and *þonne* occurred in different contexts in OE as observed above: *þa* in affirmative and temporal contexts, *þonne* in non-affirmative contexts. The result of this large-scale reduction in the use of *þa*, we suggest, is that the profile of *then* in clause-initial position lost some of its OE magical frequency, and it became less prominently distinct from the other short clause-initial deictic adverbs. We suggest therefore that type 1 inversion following *then* was extended to deictic adverbs in clause-initial position with very similar formal and functional properties. Deixis, and discourse-linking, were thus important among the multiple factors in the ME development.

3.2 *Auxiliaries and monosyllabic finite verbs*

We now address the developing preference for auxiliaries and monosyllabic lexical finite verbs. As far as we can tell, given the facts in Tables 1-3, this preference arose over the ME period, although it is hard to date its incipient rise accurately because of the paucity of text material for some dialects in the M1 and/or M2 periods. The hypothesis we put forward is that the auxiliary effect originates in the differentiation arising between lexical finite verbs and auxiliaries over the ME period, as it was not in evidence in OE, as shown in Table 1 above: inversion following then in OE occurs in well over 90% of the attested cases, with little variation between Vf types. Inversion following other adverbs occurs at well under 10% of the cases, again with little variation between Vf types. The rates of type 1 inversion were thus not determined by Vf-type in OE. There is one argument in the literature that auxiliaries may already have been different from other verbs in OE in prosodic terms: [Getty \(2000\)](#) argues for modal verbs that there is a distinction between early and later OE poetry with respect to primary stress. In *Beowulf*, the earlier poem, modals typically occur on alliterating positions, suggesting that the stem carries primary stress. This is no longer the case in *The Battle of Maldon*, which was composed after the battle it relates, which was fought in 991. Getty suggests that the modals at this stage were already on the way to being grammaticalized, losing primary stress in the process, although see [Tangelder & Los \(2017\)](#) for an opposing view.

It seems reasonable to assume that the various types of finite verb at first weakened in tandem as a result of the weakening of unstressed syllables in the transition from OE to ME, resulting in the reduction and/or loss of stem extensions, and of inflectional endings ([Minkova 1984, 1991](#)).⁸ It seems equally reasonable to assume that finite verbs (including pre-auxiliaries) still carry primary stress on the stem in Middle English. It is hard to establish this with certainty, but examples of type 1 V2 such as those from Ormulum (a poetical text with extremely strict metre from ca. 1200) in (11), suggest strongly that fronted finite verbs, whether main verbs or auxiliaries, carry primary stress (as marked by accents):

⁸ An anonymous reviewer asks whether this process is comparable to the process of 'Nebensilbenabschwächung' (weakening of non-accented syllables) in German, which also set in at the end of the OHG-period ([Braune 2004](#)). The processes in the history of English and German are similar, but English went further ahead with schwa-deletion, which led to changes in the definition of a prosodic word in the lexicon. Arguably this last step did not occur in the history of German, where schwa-deletion remains a surface phenomenon of phonological realization at the interface.

- (11) a. | *Ġet wíle icc sháwenn gúw forrwhí* || *Goddspell iss*
 Yet want I show you why gospel is
Goddspell nemmedd. |
 gospel called
 ORM.PREF.L81.92
- b. | *Þa máhht tu lákenn Gódd wiþþ áll* |
 then may you worship God with all
 ORM.I.52.511

We suggest that this situation is maintained over the ME period: initial adverbs like *then*, and other adverbs over the ME period come to trigger type 1 inversion by virtue of their status as situation operators, extending type 1 V2 to other adverbs beside *then*. The fronted Vf is short, often monosyllabic with at most a weak vocalic ending, and carries primary stress. The next step is to account for the loss of type 1 V2 following other adverbs from E1 onward, and following *then* over the E2 period, as shown by the steep decline over the early Modern period in Figures 1 and 2 above. What is very striking is that this dating coincides with the widely accepted dating for the grammaticalization of modals and other auxiliaries as function words (as in Warner's 1993 detailed account of the history of English auxiliaries). A typical feature of grammaticalization processes is that they represent weakening across the board. Pre-auxiliaries lost the last formal vestiges of their lexical verb status; phonological reduction had already taken place earlier through weakening of unstressed syllables, which in turn led to the reduction and subsequent loss of verb endings. We suggest that the next and crucial step was prosodic reduction in the form of loss of primary stress: as function words, auxiliaries no longer carried primary stress. In type 1 V2 following adverbs, the initial XP, the fronted Vf, and the pronominal subject thus came to be all three realized as unstressed syllables. This constitutes a violation of prosodic requirements: a prosodic foot must be headed by a stressed syllable. This development is in sharp contrast to what happened in questions and focal negative-initial clauses, where type 1 V2 was maintained to the present day. In these contexts, the initial XP carries focus, hence primary stress, and the auxiliary is phonologically weak, as is the pronominal subject: the examples in (12) illustrate this (accents indicate primary stress):

- (12) a. [but if I finde meanes to make you a Lady], whát wilt thou séy
 then?
 (Deloney-e2. 84.4)
- b. nó lesse are we Énglyshe [men géuen to úntowárdnes]
 (morewol-e1.1,253.35)

Primary stress in these cases is on the initial XP, *what* in (12a), the initial negative *no lesse* in (12b), and this is followed by an unstressed Vf. This is in contrast to the examples in (11), dating back to around 1200, where the stem of pre-auxiliaries is stressed, following an unstressed initial adverb. This suggests strongly that auxiliaries lost the ability to carry primary stress in the final stages of the auxiliatation process. On this scenario, the cause for the loss of inversion of pronominal subjects following adverbs is a prosodic one: it resulted in a clause-initial prosodic foot that was unheaded. An anonymous reviewer raises the question as to whether there is independent evidence for this, e.g. from poetic texts. Note that our account predicts that an inversion sequence consisting of three unstressed syllables is no longer found, so that negative evidence would be required to confirm that. We also predict, however, that instances of *then* or other adverbs with inversion over the 16th century should carry stress on the initial adverb, like questions and focal negative-initials as in (2) and (12). This can be established on the basis of the context or the metre or verse structure. Appendix B briefly discusses some poetic examples that suggest this. In the prose texts in our corpus, such examples are typically found at the conclusion of a paragraph or statement. Two examples are given in (13), both dating from the E2 period (1570-1640) - the preceding context is in square brackets:

- (13) a. “[Thou hast, ” quoth she, ” heere a forme of false felicitie & the cause. Turn thy selfe now to the contrary syde of the mynde,] for **ther shal thou** see strait way the true that I promysd.”

‘[you have here, she said, a form of false felicity and its cause. Now consider the opposite side of the mind,] for there you will see straightaway the truth that I promised.’

(boethel-e2-h)[59.54])

- b. [In the beginnige of this Wynter I was touched with the Goute in the joynte of my great toe, and it began somewhat sharpely,] and **yet was I** spedely eased, and for that tyme cured by that oyle only.

(talbot-e2-p2[1.3,39.9])

Ther in (13a) introduces the conclusion of the argument which contrasts with the observation in the preceding context. This presumably requires primary stress on the adverb. The same is true for (13b): yet typically introduces a contrast with the preceding context. The cases of pronoun inversion following adverbs overall are highly amenable to such a contrastive interpretation, furnishing the initial prosodic foot with a stressed syllable. This supports our

argument that the reanalysis of pre-auxiliaries as functional elements entailed the loss of the ability to carry primary stress and led to the loss of type 1 V2 following initial adverbs.

3.3 *The auxiliary effect in Middle English dialects: microvariation*

Having argued that the loss of V2 following adverbs was the result of the reanalysis of pre-auxiliaries as function words (and the concomitant rise of *do*-support), we should also address potential alternative accounts in the literature. Several of these are based on the hypothesis that V2 was lost due to dialect contact between Scandinavian-influenced dialects (in the North and North- and Northeastern dialects) and the dialects of the southern Midlands and the South, following up on the accounts in Kroch & Taylor (1997) and Kroch, Taylor & Ringe (2000b). This section therefore addresses the question whether the auxiliary effect, which we take to reflect the prosodic weakening identified in the previous section, is part of a general process (which may also involve dialect contact) or might be specific to texts that show higher rates of inversion generally. If the latter is the case, high rates of inversion should be more readily attributable to Scandinavian influence, as proposed by Kroch & Taylor (1997) and Kroch et al. (2000b). We therefore consider the ME dialectal evidence based on the available parsed corpora of ME, considering three dialect groups: Northern; East Midlands/London, and the West Midlands dialects, focussing on the combination of type of initial adverb and type of Vf. The data study in section 3.3.1 will show, on the one hand, that there is an increase in the use of type 1 V2 structures that is consistent across the dialects under study: inversion following short, deictic, native English adverbs, followed increasingly by an auxiliary or a monosyllabic lexical Vf. This suggests that the proposal in Kroch & Taylor (1997) and Kroch et al. (2000b) that there is a strict (categorical) V2 grammar in the Northern dialect, due to Scandinavian influence, which was in competition with a more flexible grammar in other dialects, needs further nuance. Even the Northern prose version of the *Benedictine Rule* (BenRul) which forms the basis for Kroch et al.'s argument, although certainly stricter than that in other dialects, does not quite represent a strict V2 language, but one with a type of fine-grained variation in line with that in other dialects, which share a preference for auxiliaries and monosyllabic lexical verbs in late Middle English. This is not intended as an argument against Scandinavian influence, which we consider undeniable. Rather, we will argue that the picture is more nuanced, and suggests micro-variation as an additional factor.

3.3.1 Dialect data

3.3.1.1 The Northern texts

The Northern dialect material in the PPCME corpus is restricted to the Northern prose version of the *Benedictine rule* (BenRul) for the M3 period (1350-1420), and to five texts from the M4 period (1420-1500) (see Appendix A). Because of the paucity of ME evidence for the Northern dialects, we also included the Northern version of *Cursor Mundi*, a verse text from around 1300 which predates the BenRul text by about a century. Including this text, even though its metre may influence the rate of inversion, may add to our picture of the rates of inversion in the North.

Figure 3 gives the rates of inversion following *then* and Other adverbs over the ME period. Note that M1 is absent for lack of texts, M2 represents the Northern *Cursor Mundi* text; M3 the BenRul text.

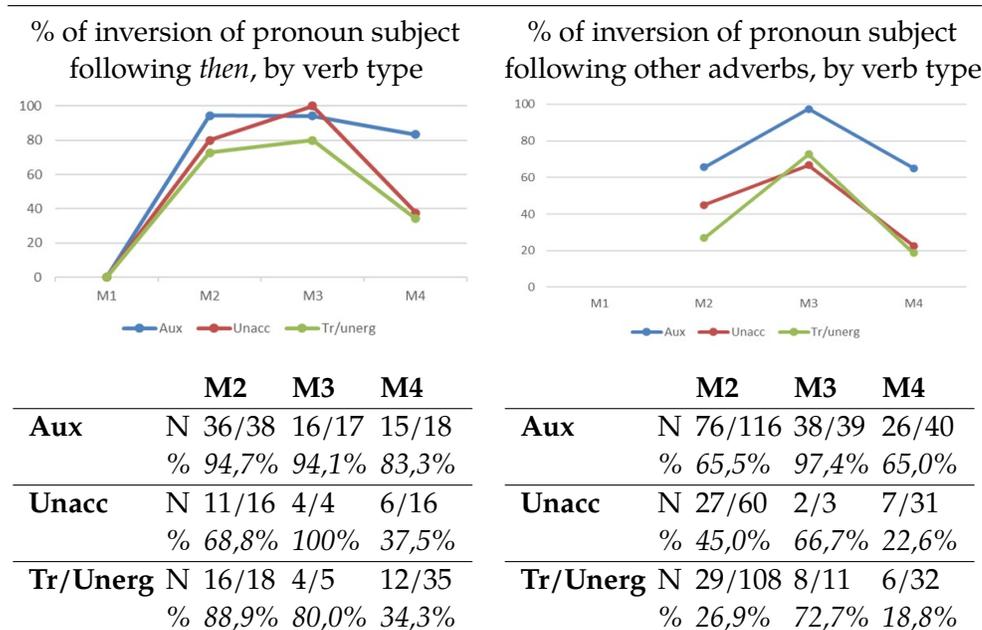


Figure 3 Diachronic development of inversion in Northern texts, by verb type with *then* adverbs (left) and other adverbs (right)

The rate of inversion following *then* is high in M2 and M3, substantially lower in M4. There is minor and fluctuating differentiation between verb types in M2 and M3, and a clear auxiliary effect in M4. On the other hand, the Other adverbs show a clear auxiliary effect throughout, with rates of inversion for auxiliaries that are some 30% higher than for the other verb types.

In M3 (the BenRul text), the rates of inversion for the various verb types are strikingly higher than in both the earlier and later periods. This, more than anything else, shows that BenRul is an outlier even among the Northern texts. There is thus strong Scandinavian influence in this text, though not a categorical V2 grammar.

3.3.1.2 *The East Midlands texts*

The East Midlands dialect is substantially represented in the PPCME corpus for the periods M1, M3 and M4. There is only one text for the M2 period. The rates of inversion are given in Figure 4:

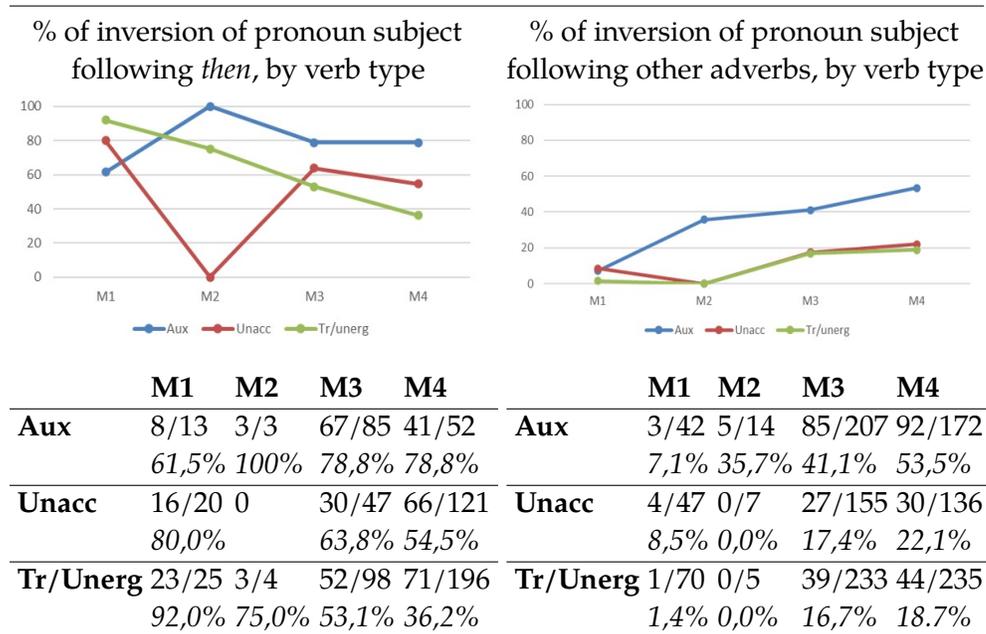


Figure 4 Diachronic development of inversion in East Midland texts, by verb type with *then* adverbs (left) and other adverbs (right)

The earliest East Midlands texts in M1 (1150-1250) show a continuation of the OE patterns in M1. The figures for M2 are based on one short text, suggesting a sampling effect. M3 and M4 are much more robustly represented and show a high rate of inversion following *then*, which is stable for auxiliaries into the M4 period, but considerably lower for lexical verbs. Figure 4 shows that inversion of auxiliaries following other adverbs is rising considerably from M2 onward, and with a clear auxiliary effect.

3.3.1.3 *The West Midlands texts*

The figures for M1 are in line with those for OE as in Table 1. There are no M2 texts. For *then*, there is a significant decline for lexical verbs in the transition to M4, but the figures for auxiliaries in M4 are remarkably constant, in line with the developments in the other dialects, with a clear auxiliary effect.

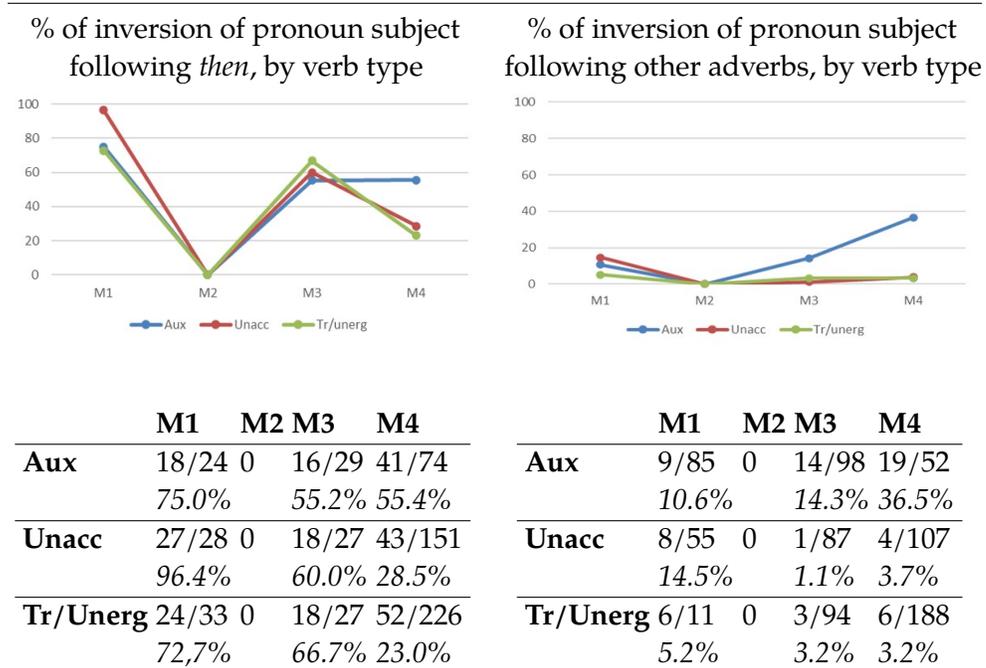


Figure 5 Diachronic development of inversion in West Midland texts, by verb type with *then* adverbs (left) and other adverbs (right)

When we turn to other auxiliaries, we also initially see a continuation of the OE patterns in M1. M3 and M4, however, show a marked auxiliary effect, parallel to the other dialects, with a considerable rise over the M3 and M4 periods.

3.3.1.4 *Interim discussion and conclusions*

The previous subsections show that there is clear evidence that the rates of Type 1 inversion following adverbs are substantially higher in the texts written in areas with strong Scandinavian influence. In contexts following other adverbs, we also see higher rates of inversion than in other dialects, but we also see the clear auxiliary effect as encountered in the East and West Midlands. This shows, we would argue, that the auxiliary effect that is gaining

pace over the Middle English period is not a (direct) contact feature, which in turn supports our interpretation that the auxiliary effect reflects a larger and more general development than dialectal differentiation induced by contact influence. This is in line with our hypothesis that the auxiliary effect reflects the ongoing grammaticalization process that (pre-) auxiliaries were undergoing, ultimately resulting in their reanalysis as function words over the first half of the sixteenth century. In turn, it suggests that the variation in V2 that we see across the dialects may be more plausibly treated in terms of microvariation than in terms of grammar competition, as proposed by Kroch & Taylor (1997) and Kroch et al. (2000b). Microvariation situations imply that multiple factors play a role in the variation pool, which may interact in determining the potential change resulting from it. Westergaard (2019) approaches this in terms of micro-cues for language learners in multilingual situations. A number of such factors can be distilled from our discussion so far. We recapitulate them in the following section, as a preliminary to a quantitative analysis to test their statistical significance.

4 A QUANTITATIVE ANALYSIS

This section turns to the factors that influence the development and loss of type 1 V2 following adverbs, as discussed in the previous sections, and tests their effect on the rate of inversion in the Middle English and early Modern English subperiods. Note that the dialect data discussed in section 3.3.1 are not part of this statistical analysis. Type 1 inversion of pronominal subjects following adverbs is influenced by factors related to the initial constituent as well as the finite verb. These can be summarized as follows:

- (14) a. **XP**: weight (shortness), discourse linking, focality, operator status
 b. **Vf**: weight (shortness), verb type (auxiliary, unaccusative, transitive/unergative intransitive)

The weight of XPs triggering V to Force movement to the left of a pronominal subject in SpecFinP was shown to be an important factor: adverbs triggering inversion of pronominal subjects are short. We have also demonstrated that they are deictic, i.e. they are discourse-linking. We have also seen above that the type and the weight of Vf are highly relevant factors. Taking these properties of initial adverbs and finite verbs as discussed in the previous sections as our starting point, we compare them with initial constituents that show contrasting properties: objects (which we assume carry contrastive focus); initial proclitic *ne* in early ME (which is an operator), and initial focal

		M1	M3	M4	E1	E2	E3
No	N	1678	3610	5146	5337	8306	6055
	%	76.5%	77.9%	80.2%	84.4%	93.3%	97.3%
Yes	N	516	1023	1270	988	597	169
	%	23.5%	22.1%	19.8%	15.6%	6.7%	2.7%
Total		2196	4633	6416	6325	8903	6224

Table 4 Rates of inversion in Middle and Early Modern English subperiods

negatives, which are operators and carry focus. We have left out questions in this analysis, since they always trigger V2 regardless of XP-weight or verb type in ME and into the EME period, although verbs become restricted to auxiliaries.

The datapool consists of all clauses with an initial XP, a finite verb, and a pronominal subject. (14a) concerns the properties of initial XPs:

- The weight of all initial XPs is calculated by the number of characters
- *Then* adverbs are defined lexically. They are coded as ‘discourse-linking’
- Other adverbs are defined lexically. *Here, there, yet, nu, so* are coded as ‘discourse-linking’
- Initial proclitic *ne* is marked as ‘operator’ (note that it was lost by ca. 1350)
- Initial focal negatives are marked as ‘operator’ and as ‘focal’
- All other initial XPs (preposition phrases, clauses) are merely coded for weight, as defined by the number of characters

(14b) concerns the properties of finite verbs:

- The weight of all finite verbs is calculated by the number of characters
- Verb type is marked as ‘aux’ (modals, *have, be*), ‘unacc’ (unaccusative) or ‘trans/unerg’ (transitive/unergative verbs)

For ease of interpretation, Table 4 recalls the overall number of items and the rate at which inversion occurs.

The statistical significance of the observations in sections 2 and 3 was tested by fitting a binary logistic regression within a generalized mixed model using the *glmer* function from the *lme4* package (Bates, Mächler, Bolker & Walker 2015) in R for each individual subperiod. Post-hoc contrast testing was done using the *car* package (Fox & Weisberg 2019). We take INVERSION (Yes or No) as the dependent variable with No as the reference category. The fixed factors are the properties identified in the previous sections and summarized above: VF LENGTH (measured as the logarithm of the number of letters, centered around the mean), VF TYPE (aux, trans/unerg or unacc), PREC XP LENGTH (measured as the logarithm of the number of letters, centered around the mean), DISCOURSE LINKING (Yes or No; the adverbs outlined in section 2 were coded as YES), XP FOCUS (Yes or No, where initial objects and negated focal constituents were coded as YES) and XP OPERATOR (Yes or No; where initial negated constituents or proclitic *ne* were coded as YES). For the Middle English subperiods, varying intercepts TEXT ID were added to the random effects structure of the model to control for variation in inversion frequencies in different texts. For the early Modern English subperiods, texts were grouped by author and varying intercepts for AUTHOR were added to the random effects structure of the model, as adding TEXT ID as a random effect results in convergence problems due to relatively short texts and texts which do not show inversion.

4.1 M1

Table 5 summarizes the main statistics for the M1 period. We find significant main effects of Vf Length, Prec XP Length, Discourse Linking, XP Focus, and XP operator. The type of verb does not play a significant role in determining the occurrence of inversion.

The Odds Ratios in Table 5 are an indication of effect size, and tell us something about the direction in which factors influence the surface word order. If the Odds Ratio is above 1, this indicates a favouring effect on the chances of inversion. If the Odds Ratio is below 1, the chances of inversion decrease. This means that for Vf Length, with an Odds Ratio of .777, the chances of inversion decrease as the length of the verb increases. At the same time, inversion becomes less likely as the length of Prec XPs increases, as indicated by the Odds Ratio of 0.838. Focus on a PrecXP also has a strong disfavoured effect on inversion, compared to when there is no focus on a PrecXP, as indicated by the Odds Ratio of .421. Discourse Linking and an Operator XP, on the other hand, significantly increase the likelihood of inversion. The Odds Ratio of 1.587 indicates that the effect of Discourse Linking is modest, while the Odds Ratio of 67.907 indicates a very strong effect.

Model term	P-value	Odds Ratio	CI Low	CI High
Intercept	.443	.787	.428	1.450
Vf Length	.022	.777	.626	.963
Prec XP Length	<.001	.838	.769	.912
Vf Type: aux vs. trans/unerg	.231	.848	.648	1.110
Vf Type: aux vs. unacc	.618	.927	.687	1.250
Vf Type: trans/unerg vs. unacc	.587	1.092	0.795	1.501
Discourse Linking: No vs. Yes	.002	1.587	1.183	2.128
XP Focus: No vs. Yes	<.001	0.421	0.275	0.646
XP Operator: No vs. Yes	<.001	67.907	29.866	154.403

Table 5 Significance values and Odds Ratios (including 95% confidence intervals) for the predictors in our M1 model

4.2 M3

Table 6 summarizes the main statistics for the M3 period. We find significant main effects of Vf Length, PrecXP Length, Vf Type, Discourse Linking and XP Focus. XP Operators are no longer a significant predictor of the occurrence of inversion.

Model term	P-value	Odds Ratio	CI Low	CI High
Intercept	0.005	3.648	1.471	9.046
Vf Length	<.001	0.690	0.587	0.812
Prec XP Length	<.001	0.607	0.557	0.661
Vf Type: aux vs. trans/unerg	<.001	0.332	0.265	0.415
Vf Type: aux vs. unacc	<.001	0.374	0.294	0.475
Vf Type: trans/unerg vs. unacc	.3988	1.126	0.853	1.486
Discourse Linking: No vs. Yes	<.001	2.320	1.818	2.960
XP Focus: No vs. Yes	<.001	4.447	3.094	6.391
XP Operator: No vs. Yes	0.899	0.939	0.352	2.501

Table 6 Significance values and Odds Ratios (including 95% confidence intervals) for the predictors in our M3 model

The Odds Ratios in Table 6 indicate a disfavoured effect on inversion for Vf Length, Odds Ratio = 0.690, and PrecXP Length, Odds ratio = 0.607. This means that as the length of a verb or a PrecXP increases, the odds of inver-

sion significantly decreases. Discourse Linking has a favouring effect on inversion. A discourse linking PrecXP increases the odds of inversion by 2.320. In contrast to the M1 period, a focussed PrecXP also has a favouring effect on inversion. A focussed PrecXP increases the odds of inversion by 4.447. In M3 the type of verb also starts to play a role. The results of the analysis show that auxiliaries have a different effect on the rate of inversion compared to transitive, unergative and unaccusative verbs. Auxiliaries significantly decrease the odds of inversion compared to transitive/unergative verbs, Odds Ratio = 0.332, and compared to unaccusative verbs, Odds Ratio = 0.374. At the same time, transitive/unergative verbs do not behave differently from unaccusative verbs.

4.3 M4

Table 7 summarizes the main statistics for the M4 period. We find significant main effects for all factors, except XP Operator.

Model term	P-value	Odds Ratio	CI Low	CI High
Intercept	<.001	7.124	3.600	14.097
Vf Length	<.001	0.482	0.413	0.562
Prec XP Length	<.001	0.585	0.541	0.632
Vf Type: aux vs. trans/unerg	<.001	0.235	0.197	0.281
Vf Type: aux vs. unacc	<.001	0.293	0.242	0.356
Vf Type: trans/unerg vs. unacc	.029	1.248	1.023	1.520
Discourse Linking: No vs. Yes	<.001	2.329	1.912	2.836
XP Focus: No vs. Yes	<.001	4.908	3.703	6.505
XP Operator: No vs. Yes	0.344	0.594	0.202	1.748

Table 7 Significance values and Odds Ratios (including 95% confidence intervals) for the predictors in our M4 model

The Odds Ratios in Table 13 indicate a disfavoured effect on inversion for Vf Length, Odds Ratio = 0.482, and PrecXP Length, Odds Ratio = 0.585. This means that as the length of a verb or a PrecXP increases, the odds of inversion significantly decrease. Discourse Linking, on the other hand, has a favouring effect on inversion, Odds Ratio = 2.329. If the PrecXP is a discourse linking adverbial, the chances that inversion occurs increase by 2.329. Focused XPs are also more likely to occur in inversion contexts. The Odds Ratio of 4.908 indicates that the odds of inversion occurring are 4.908 times as high when the PrecXP is focussed then when it is not. Vf Type plays a similar role as in M3. Trans/unerg verbs are significantly less likely occur in inversion contexts

than auxiliaries, Odds Ratio = 0.235, as are unaccusative verbs, Odds Ratio = 0.293. We also observe a difference between trans/unerg and unaccusative verbs: the odds of inversion increase by 1.248 when the verb is unaccusative compared to when it is trans/unerg. The lower CI boundary is very close to 1, however, indicating that if the effect is indeed true, it is very small.

4.4 E1

Table 8 summarizes the main statistics for the E1 period. We find significant main effects of Vf Length, Prec XP Length, Vf Type, Discourse Linking and XP Focus.

Model term	P-value	Odds Ratio	CI Low	CI High
Intercept	.040	0.529	0.288	0.970
Vf Length	<.001	0.628	0.528	0.747
Prec XP Length	<.001	0.721	0.672	0.774
Vf Type: aux vs. trans/unerg	<.001	0.429	0.350	0.527
Vf Type: aux vs. unacc	<.001	0.416	0.336	0.515
Vf Type: trans/unerg vs. unacc	.801	0.969	0.761	1.235
Discourse Linking: No vs. Yes	<.001	3.641	2.933	4.520
XP Focus: No vs. Yes	<.001	4.518	3.374	6.050
XP Operator: No vs. Yes	.254	2.142	0.578	7.937

Table 8 Significance values and Odds Ratios (including 95% confidence intervals) for the predictors in our E1 model

The statistical analysis for E1 is very similar to M4. An increase in Vf Length and Prec XP Length both result in lower odds of inversion, as indicated by the Odds Ratios of 0.628 for Vf Length, and 0.721 for PrecXP Length. Discourse Linking and XP Focus have a favouring effect on the odds of inversion. The Odds Ratio for Discourse Linking is 3.641, indicating that the odds are 3.641 higher when the PrecXP is discourse linking compared to when it is not, and the Odds Ratio for XP Focus is 4.518, indicating that the odds are 4.518 times higher when the PrecXP is focused, compared to when it is not. We also find that the use of a trans/unerg and unacc verbs reduces the odds of inversion compared to the use of an auxiliary, with respective Odds Ratios of 0.429 and 0.416. The minor, yet significant, difference between trans/unerg and unacc verbs that was observed in the M4 period, is not observed in E1.

4.5 E2

Table 9 summarizes the main statistics for the E2 period. We find significant main effects of all factors.

Model term	P-value	Odds Ratio	CI Low	CI High
Intercept	<.001	0.145	0.073	0.290
Vf Length	<.001	0.698	0.569	0.856
Prec XP Length	<.001	0.783	0.720	0.851
Vf Type: aux vs. trans/unerg	<.001	0.568	0.447	0.720
Vf Type: aux vs. unacc	<.001	0.487	0.381	0.623
Vf Type: trans/unerg vs. unacc	.286	0.859	0.649	1.135
Discourse Linking: No vs. Yes	<.001	2.808	2.160	3.651
XP Focus: No vs. Yes	<.001	3.813	2.807	5.178
XP Operator: No vs. Yes	<.001	76.996	11.053	536.352

Table 9 Significance values and Odds Ratios (including 95% confidence intervals) for the predictors in our E2 model

The effect of Vf Length and PrecXP length is similar to the previous period; an increase in the length of these constituents results in lower odds of inversion (0.698 and 0.783 respectively). Trans/unerg and unacc verb likewise lower the odds of inversion compared to auxiliaries, as indicated by the Odds Ratios of 0.568 and 0.487. A discourse linking or focussed PrecXP lowers the odds of inversion by 2.808 and 3.813 respectively compared to when they are not discourse linking and not focussed. XP Operator is quite surprisingly a significant predictor with a very high Odds Ratio of 76.996, which indicates that the odds of inversion increase by 76.996 times when the Prec XP is an operator compared to when it is not.

4.6 E3

Table 10 summarizes the main statistics for the E3. Despite the overall low frequency of inversion (cf. Table 1), all predictors still show significant effects. Increasing Vf Length and PrecXP Length still result in reduced odds for inversion, with respective Odds Ratios of 0.229 and 0.797. Discourse Linking, XP Focus and XP Operator all have a favouring effect on inversion, as indicated by the Odds Ratios above one. The Odds Ratios for Discourse Linking and XP Focus are 3.895 and 3.206 respectively. The Odds Ratio for XP Operator is 47.340, suggesting that the effect is very strong. The effect of Vf Type is starting to reduce compared to earlier periods. In E3, only unacc verbs are

Model term	P-value	Odds Ratio	CI Low	CI High
Intercept	.043	0.308	0.098	0.967
Vf Length	<.001	0.229	0.148	0.354
Prec XP Length	.003	0.797	0.687	0.924
Vf Type: aux vs. trans/unerg	.335	0.783	0.475	1.288
Vf Type: aux vs. unacc	.017	0.571	0.361	0.904
Vf Type: trans/unerg vs. unacc	.266	0.730	0.418	1.272
Discourse Linking: No vs. Yes	<.001	3.895	2.450	6.192
XP Focus: No vs. Yes	<.001	3.206	1.512	6.801
XP Operator: No vs. Yes	<.001	47.340	4.847	462.327

Table 10 Significance values and Odds Ratios (including 95% confidence intervals) for the predictors in our E3 model

significantly different from auxiliaries. The Odds Ratio of .571 shows that unacc verbs are less likely to be involved in inversion. Trans/unerg verbs do not differ significantly from auxiliaries nor unacc verbs in their involvement in inversion.

4.7 Summary and implications

This section evaluated the statistical significance of the patterns outlined in the previous sections and their interplay in a uniform statistical model which takes all sources of variation into account. The findings first of all show that each of these variables independently (albeit with diachronic differences) influence the choice of inversion, and that none of the variables can be reduced to another. Inversion in Middle and early Modern English is thus a complex process in which multiple factors are at play.

The results also show that many factors are diachronically stable, despite reducing overall frequencies of inversion. Length, for instance, always significantly influences the odds of inversion, both for the length of the verb and the length of the preceding constituent. The general tendency is that whenever a constituent is longer (be it the verb or the preceding XP), the odds of inversion decrease. Discourse Linking is also a consistent predictor of inversion. As noted in section 3.1, the class of discourse linking adverbials that allow inversion beyond *then* remains significant predictors after their introduction.

There are also diachronic differences between the relevance of individual factors. Focused XPs show a remarkable shift. In M1, Focussed XPs are less

likely to occur in inversion contexts. In M3, however, a reversed significant effect is observed, which indicates that Focussed XPs are more likely to occur in inversion contexts. This then remains stable until the end of the early Modern English Period. An operator XP is a significant trigger of inversion in M1, but as proclitic *ne*, surviving from OE, is lost, the effect loses its significance. From E1 onwards, however, (focal) negative constituents become increasingly associated with inversion. Finally, Vf type is the factor that is most variable. There is no significance difference between the types in M1, but they start to diversify in M3, where we observe a significant difference between auxiliaries on the one hand and unaccusatives and transitives/unergatives on the other. This difference is observable well into E2, where it starts to lose its effects, presumably because of the general reduction in the frequency of inversion.

Overall, the statistical analysis confirms the findings of the previous sections:

- i. An important triggering factor for inversion in late ME was discourse-linking, in combination with XP-weight. This determined the increase of inversion following short deictic adverbs, besides *then*.
- ii. There is an increase in inversion of finite auxiliaries over the late ME period, followed by a strong decrease over the early Modern period, first following other adverbs (by the E1 period), then following *then* (by the E2 period). We take this to indicate that the loss of inversion was caused by the reanalysis of auxiliaries to functional head status, as they lost the ability to carry primary stress, and thus to form a prosodic foot with other unstressed syllables.

Section 5 will proceed with a syntactic and prosodic analysis of this development.

5 A THEORETICAL SCENARIO FOR THE COMPLEX V2 DATA IN THE HISTORY OF ENGLISH

In this section, we will motivate a theoretical scenario for the changes discussed in the previous sections: first, we have shown that V2 is partially prosodically motivated in ME, and second, that the changes that we see result from independent changes like the grammaticalization of auxiliaries and changes in the prosodic analysis of (subject) pronouns in the history of English. The assumptions we make are grounded in observations concerning the definition of a prosodic word in English and on what we generally know about the mapping between syntactic structure and prosodic structure as well as about the licensing of clitics.

5.1 *A first sketch of the development*

We assume that type 1 V2 in OE had purely syntactic triggers. Following [Hinterhölzl \(2019\)](#), we propose that OE had a system with flexible phase heads in which the fronting of a TP-internal element, including then adverbs, triggered V to Force movement. *Then* adverbs were base-generated in Spec,TP, and were fronted into the clause-initial position due to their discourse-linking properties. The rationale behind this analysis is the observation that *then*-adverbs denote (a relation to) the reference situation (the context) that is introduced by Tense given that Tense expresses a relation between two situations: the reference situation and the utterance situation (cf. [Hinterhölzl to appear](#) for the details).

We propose furthermore that, due to their status as short monosyllabic unstressed words, *then*-adverbs were prosodically licensed as pro-clitics by Vf in Force, with the lower subject pronouns being licensed as enclitic to the verb at this stage.

In the M1 period, after a reduction of the OE V2 construction following *then*, the pattern was extended to other deictic adverbs that matched the metrical profile of (ME) *then* as monosyllabic and unstressed. Remember that *then* in OE stood out in triggering V to Force⁰ movement, while most other adverbs triggered verb movement to Fin⁰.

We will see below that the developments discussed above and the eventual loss of V2 with the extended class of adverbs follows from two independently motivated developments: namely a) from the change of pre-auxiliaries to function words and b) from the change of subject pronouns from affixal clitics to free clitics in the history of English. We will see that the latter development is crucially connected to a change in the definition of a prosodic word in the history of English that is evidenced by the phenomenon of schwa-deletion. Before we can go into the details of the historical scenario in [Section 5.4](#), [Section 5.2](#) provides the reader with a short background about the mapping between syntactic structure and prosodic structure that underlies our account. We then outline our assumptions about the prosodic representation of short unstressed words and functional categories in [section 5.3](#) and show how the change in prosodic word status influences the analysis of subject pronouns leading to the pertinent loss of type 1 V2 with auxiliaries and main verbs in [Section 5.4](#).

5.2 *On the mapping of syntactic phrases to prosodic phrases*

In this section, we will outline the basic approaches to the mapping between syntactic structure and prosodic structure. There are two main approaches to

this issue: the accent-based account and the prominence-based account.

Most researchers favour an accent-based approach to the mapping between syntactic and prosodic structure (cf. Gussenhoven 1983, Uhmman 1991, Selkirk 1995) because of the special role of accents for the focus-background articulation in intonational languages. The core of these accounts consists in focus projection rules (Selkirk 1995) which serve to derive the focus domain for a given accented constituent or vice versa, to derive the placement of the sentence accent (nuclear accent) for a given focus domain. However, Büring (2006) proposes that focus projection rules can be dispensed with in a system in which (metrical) prominence relations are taken into account. He argues that such a prominence-based system (also called stress-first based accounts) also captures the default prosody in pre-focal structures.

The strongest argument for the prominence-based approach comes from the observation that the type of accent assigned to a phonological phrase depends on its metrical structure, as reported in Nespor, Shukla, van de Vijver, Avesani, Schraudolf & Donati (2008). In iambic phrases the accent is realized with greater duration (and intensity), while in trochaic phrases the accent is realized with greater pitch (height) (and intensity). This is a secure indication that stress is at the basis of accent and not the other way round. Thus, we will adopt a prominence-based approach (cf. Halle & Vergnaud 1987, Ladd 1986) that assumes that accent positions in the clause are determined by prominence relations.

5.2.1 *Prosodic domain formation in a phase-based approach*

There are two basic approaches for deriving prosodic structure from syntactic structure: end-based approaches and relation-based approaches.

In end-based approaches (cf. Selkirk 1984) boundaries of syntactic constituents are matched with prosodic boundaries. These alignment rules are best expressed in an OT-like fashion (Truckenbrodt 1999). In relation-based approaches (cf. Nespor et al. 2008, Wagner 2005) prosodic constituents are built around lexical heads on the basis of the relations they entertain with adjacent constituents.

The two approaches differ in their assumptions on how much syntactic information is available in the interface. While end-based approaches only assume the visibility of syntactic boundaries, relation-based approaches assume the visibility of syntactic relations expressed in the X'-Schema. We adopt a relation-based approach, in which prosodic domain formation goes in parallel with the syntactic derivation in a phase-based way.

To account for the difference in phrasing between a verb and an adjacent argument or adjunct (cf. Gussenhoven 1983, Krifka 1984), Hinterhölzl

(2009), following Wagner (2005), proposes that there are two modes of prosodic composition, as specified in (15) below, where main stress (nuclear accent) is indicated with underlining. In a relation between the verb and its argument, the two constituents form a prosodic unit, a phonological phrase, and main stress falls on the argument. In a verb-adjunct relation, the two constituents are mapped into two different prosodic units, that is, onto two different phonological phrases and main stress falls on the right-most prosodic unit.

- (15) a. [(weil Hans) (im Zelt blieb)]
 since John in the tent remained
 b. [(weil Hans) (im Zelt) (rauchte)]
 since John in the tent smoked

Prosodic phrasing of verb and object in German (and Dutch) crucially differs from the way they are phrased in English. While the verb and the object obligatorily form a joint prosodic constituent in German (16a), they only do so optionally in English, as is illustrated in (16b-c).

- (16) a. [(weil Hans) (das Buch las)]
 since Hans the book read
 b. [(since John) (read the book)]
 c. [(since John) (read) (the book)]

Hinterhölzl (2009) proposes two modes of prosodic composition which apply in a uniform way in German and English and take into account the phase status of syntactic constituents: while constituents that belong to the same phase-predicate (a predicate and its arguments) are mapped onto a joint phonological phrase (prosodic subordination), constituents that belong to different phase-predicates (a verb or noun and its adjuncts) are mapped onto separate phonological phrases, as is defined in (17) and illustrated in (15) above.

- (17) Modes of prosodic composition (Hinterhölzl 2009)
 a. Subordination: (DP) + V \Rightarrow ((DP) V)
 b. Coordination: (PP) & V \Rightarrow (PP) (V) (where PP is an adjunct)

A verb with two arguments is thus mapped onto the recursive prosodic structure ((DP) ((DP) V)) in an OV-language and onto the recursive structure ((DP) (V (DP))) in a VO-language. If an argument is separated from

its selecting verb by an adjunct, the initial phrasing derived is a flat structure of the type (DP) (XP) (V), where XP constitutes an adjunct. The following section addresses the issue of how the differences in phonological phrasing illustrated in (15) above are derived.

5.2.2 *Accent placement and relative prominence*

Prosodic constituents need to be headed. Next to the default procedure called extrinsic heading in (18a), which reflects the branching nature of a binary asymmetric syntactic tree, there is a procedure called intrinsic heading in (18b), which is sensitive to the nature of prosodic constituents being combined.

- (18) a. *Extrinsic heading:*
 In prosodic composition, the right-hand member is metrically stronger than its sister constituent
- b. *Intrinsic heading:*
 In the combination of two distinct prosodic constituents, the constituent that is higher on the hierarchical layer counts as metrically stronger than its sister constituent

Intrinsic heading makes use of phase-theory. When the combination of a verb and its complement is evaluated prosodically, there is an intrinsic asymmetry: the DP-argument constituting a complete phase has already been mapped onto a phonological phrase when combined with the verb, which is standardly mapped onto a prosodic word. Thus, if a language like German uses intrinsic heading, the preceding object counts as metrically stronger than the verb with which it forms a prosodic constituent, guaranteeing that main stress falls on the preverbal object and not on the verb.

If we assume along the lines of Halle & Vergnaud (1987) that during prosodic evaluation the labelled tree is converted into a bracketed grid representation, the relative strengths of the several accents in the clause are derived, as is illustrated in (19) for a putative German sentence comprising a subject DP, two adjunct XPs and a direct object DP and the verb.

- (27) a. for [fo:r] - four
 b. can [kaen]- (tin) can
 c. at [aet] - hat
 d. him [him] - hymn
- (28) a. for [fr]- for Timothy
 b. can [kan] [kn] - can pile (cf. compile)
 c. at [at] - at home (cf. atone)
 d. him [im] [m] - need him (cf. Needham)

Function words can appear in strong form, when focused, uttered in isolation, or when they appear in sentence final position, as in (29). The latter two cases can be subsumed under the generalization that monosyllabic function words are stressed and strengthened if they form a prosodic unit by themselves, an utterance phrase in (29b) and a phonological phrase in (29c).

- (29) a. She spoke AT the microphone not WITH it [aet]
 b. A: Who do you love? B: Him [him]
 c. Who did she look at [aet]

In all other cases, monosyllabic function words appear in weak unstressed form. That they are completely unstressed indicates that they lack the minimal requirement for forming a prosodic word. They are un-footed and are thus to be analysed as syllables in need of a prosodic host. Therefore, they are constrained to form a joint prosodic constituent with a stressed element, necessarily violating the SLH. According to Selkirk (1995), they may either form an affixal clitic or a free clitic. (30) illustrates an affixal clitic adjoined to the prosodic word of its host (that is, its host category). (31) illustrates a free clitic adjoined to the phonological phrase of its host category (it forms a joint phonological phrase projected by the prosodic word of its host).

- (30) (Φ (ω σ (ω))) affixal clitic
 Fnc Lex
- (31) (Φ σ (Φ (ω))) free clitic
 Fnc Lex

For Modern English (EME), Selkirk (1995) argues that the correct solution must be (31), where the number of unstressed syllables found in certain phrases or clauses is greater than the ones that can be accommodated within a prosodic word. Note that, due to the Germanic foot, a prosodic word

can have maximally one unstressed syllable in word-initial position, as illustrated in (32). In (32), the acute accent indicates the syllable carrying main stress, while the rounded accents indicate unstressed syllables. Since several unstressed syllables corresponding to functional heads can precede the unstressed syllable in a prosodic word, the prosodic rendition of function words in (32) must be as given in (33). Both types of clitics must therefore be exempt from the SLH.

- (32) a. fôr â mấssàge
b. ât hêr âbilities
c. yôu cân pêrturb
- (33) a. (Φ for (Φ a (ω massage)))
b. (Φ at (Φ her (ω abilities)))
c. (Φ you (Φ can (ω perturb)))

The analysis of function words as free clitics on a following lexical head proposed by Selkirk (1995) depends on the recursive condition in (34). It is not any prosodic word that can serve as a host for free clitics. In particular, we propose that host and free clitic must be contained in the same (strong) phase.

- (34) A syllable that is a prosodic sister of a prosodic word or a prosodic sister to a free clitic of a prosodic word in the same strong phase can form a free clitic with that prosodic word

Since neither the auxiliary nor the subject project a prosodic phrase or stand in a head-argument relation with the lexical verb, they are directly mapped into a joint phonological phrase projected by the latter, as illustrated in (35b) for the sentence (35a) containing two unstressed function words. After restructuring of the subject pronoun, both functional elements can form free clitics with prosodic word of the verb. This is possible since in Modern English both subject and auxiliary are standardly assumed to be contained in the same strong phase as the lexical verb, namely within IP/TP.

for the pronominal subject, we assume that in OE the subject pronoun constitutes an affixal clitic forming a prosodic word with the verb in the C-domain, while the discourse anaphoric, weak, monosyllabic adverb is licensed as a free clitic by the adjacent prosodic word of the verb, as is illustrated in (37).

- (37) *Than for he to London* (invented example)
 then went he to London
 initial prosodic phrasing:
 (Φ than (Φ (ω for_he) (to London))
 deleting outer boundaries:
 than (ω for_he) (Φ to London)
 rephrasing of *than* as a free clitic:
 (Φ than (Φ (ω for_he))) (Φ to London)

5.4.1 *First stage: Late OE/Early ME (M1)*

After the loss of secondary accents and the prosodic weakening of unstressed syllables to schwa, early schwa deletion set in (cf. Sweet 1922: 374 "there can be no doubt that weak vowels were often elided before another vowel in ordinary OE speech"). After the tenth century schwa-deletion became more frequent and general and is well-documented for the Late OE and EME period (Sweet 1922). Schwa is deleted in word-final position before a vowel or the phoneme /h/. The latter fact is important and indicative for the prosodic analysis of subject pronouns in this period. The examples (38) are from the Peterborough Chronicle and illustrate verb-final schwa-deletion before a subject or object pronoun (Clark 1970).

- (38) a. smoked heom (\leftarrow smokede heom)
 b. makod he (\leftarrow makode he)
 c. laed him (\leftarrow laede him)

According to Minkova (1984), schwa-deletion targets the word-final vowel in the prosodic representation of (38b) in (39). Remember that in our approach, the subject pronoun must either be analysed as an affixal or as a free clitic in the system of Selkirk (1995).

- (39) [c [w makode] he] c...clitic group, w ...prosodic word

The analysis (39) of (38b) clearly indicates two things: the subject pronoun in the inversion context with the finite verb did not form a prosodic word with the verb, or schwa-deletion should target the weak vowel of the

subject pronoun or fail to apply to the preceding verb-final weak vowel. This implies that the subject pronoun must be analysed as a free clitic at this stage. We argue below that this was crucial for the historical change under investigation.

What could be the reason for schwa-deletion in late OE and early ME? While German exhibited the same phonological process, namely loss of secondary accents leading to weak unstressed syllables, it never generalized a rule of schwa-deletion in the same domain, as is illustrated in (40).⁹

- (40) *Gestern arbeitete er*
 Yesterday worked he

German thus allows an unlimited number of unstressed syllables following the accented syllable within the prosodic word: main stress on the verb in (40) falls on the first syllable and a secondary stress falls on the second syllable, followed by two unstressed syllables of the verb, phonetically realized as schwa, plus the unstressed syllable of the subject pronoun. *Schwa*-deletion in Modern English seems to be due to a prosodic condition that limits the number of unstressed syllables following the stressed syllable in the prosodic word to one, giving rise to the regular rhythmic pattern s-w. This in turn implies that a weak subject pronoun following a Vf that is not monosyllabic cannot be licensed as an affixal clitic, given that the prosodic word of the verb cannot host more than one unstressed syllable in word-final position.

It was observed in section 3 that *then*+V2 with lexical verbs was reduced in frequency. We would argue that, due to the change in the prosodic definition of a phonological word in this period, only monosyllabic verbs could be taken to form a prosodic word with the following subject pronoun. More complex verbs could no longer prosodically license both a preceding weak adverbial and a following weak subject as free clitics, as illustrated in (41). In (41e), the adverb cannot be rephrased as a free clitic, since it is not a prosodic sister to the prosodic word of the host but to the phonological phrase projected by the host. In simple words, the adverb would have to surpass two

⁹ An anonymous reviewer points out that schwa-deletion also occurs in spoken German, as is illustrated in (ia). The crucial point is that schwa-deletion is an optional (surface) phonological phenomenon occurring in (fast) colloquial speech but is not triggered by a lexical requirement that reduces the phonological word in German in a certain way as this was the case in the history of English. As is illustrated in (ib), lack of schwa-deletion does not affect the grammaticality of the utterance.

- i. a. Ich glaub_ an Gott
 b. ich glaube an Gott
 'I believe in god'

brackets, while only one bracket can be deleted or surpassed by restructuring at one time. Thus, the adverb is necessarily strengthened and rephrased as a separate phonological phrase.

- (41) a. Tho makod he
 b. initial prosodic phrasing:
 (Φ than) (Φ (ω makod) he)
 c. deletion of outer boundaries:
 than (ω makod) he
 d. rephrasing of the subject:
 than (Φ (Φ (ω makod) he)
 e. restructuring of the adverb:
 *(Φ than (Φ (ω makod) he))
 f. strengthening of the adverb:
 (Φ than) (Φ (Φ (ω makod) he)

At this stage, we see a split in V2-occurrences between monosyllabic main verbs and more complex main verbs. Furthermore, the prosodic strengthening of the adverb with more complex verbs forces a re-interpretation of its function from an unstressed continuing situation topic to a shifting situation topic that is only licensed discourse-initially or together with an explicit frame adverbial that introduces a new situation topic (cf. [Frascarelli & Hinterhölzl 2007](#) for the role of continuing and shifting aboutness topics).

5.4.2 *Second stage: Early ME (from M2 onwards)*

At this stage, the *then*+V2 pattern begins to thrive through the introduction of auxiliaries since auxiliaries could at that stage be taken to represent prosodic words, but due to their typical monosyllabic structure could host a subject pronoun as an affixal clitic. This is illustrated in (42), where *than* constitutes a prosodic sister of the prosodic word *is he* and can thus be rephrased as a free clitic, as illustrated in (42c). The participle in (42) can then be rephrased as a separate phonological phrase or restructure into the phonological phrase of the directional PP.

- (42) a. Than is he gone to London (invented example)
 b. initial prosodic phrasing:
 (Φ than) (Φ (ω is_he) (Φ gone (Φ to London))
 c. deletion of outer boundaries:
 than (ω is_he) gone (to London)

- d. rephrasing as a free clitic:
 (Φ than (Φ (ω is_he))) gone (Φ to London)

5.4.3 *Third stage: Late ME (from M4 onwards)*

When auxiliaries are reanalysed as function words and lose their prosodic word status, they enter the derivation as simple syllables that can be strengthened to a prosodic word only as a last resort at the syntax-prosody interface. This implies that auxiliaries, no longer constituting prosodic words in the lexicon, fail to license head movement of the subject pronoun into the C-domain (cf. the condition in (36) above).

Thus, the subject pronoun needs to be licensed as a free clitic and will block the analysis of the adverbial as a free clitic, even in cases in which the auxiliary constitutes a monosyllabic word, as is illustrated in (43). In (43c), the question arises why the three syllables cannot simply be licensed as free clitics by the participle. The answer must be that the participle is too low in the structure to function as a valid host at least for the adverb and the auxiliary that occupy the C-domain and must thus be taken to be contained in different (strong) phases (see condition of containment in the same strong phase in (34) above).

Hence the adverb needs to be strengthened, which is costly. It must be reanalysed as stressed and fails to maintain its pure discourse-anaphoric role. The rationale for V to Force movement (the Force head is the prosodic host of clitics), is lost and the pattern falls together with V3 pattern triggered by other (longer) adverbs. As is indicated in (43d), we propose that the auxiliary is strengthened to a prosodic word as a last resort and is thus able to host the subject pronoun as a free clitic, with the sentence initial adverb forming a separate phonological phrase.

- (43) a. Than is he gone to London (invented example)
 b. deletion of outer brackets:
 (σ)(σ (σ (gone (to London))))
 c. no new valid prosodic constituent results:
 * σ σ (σ (gone(to London)))
 d. adverb is assigned word and phrasal stress:
 (Φ thàn)(Φ (Φ (ω is)) he) (Φ gone ...)

5.4.4 *Theoretical evaluation*

Let us now take stock of the changes and their consequences for the analysis of verb movement into the C-domain. As shown in (43) above, the *then*-V2

construction after the full grammaticalization of pre-auxiliaries to function word status is derivationally costly and does not permit *then*-adverbs to exert their pure discourse-anaphoric function. Hence the grammar is in need of an alternative structural configuration that is more economic from a derivational point of view and more appropriate from a discourse-functional point of view.

As assumed above, OE had a system of flexible phase heads, which were transparently indicated by verb movement to (and spell-out in) ForceP and FinP, respectively. Verb movement to ForceP gives rise to type 1 V2, appearing with constituents moved into the C-domain from a clause internal position (*wh*-words, negation and *then*-adverbs). In these cases, the finite verb precedes discourse given nominal subjects and subject pronouns. Other adverbs give rise to type 2 V2 which shows more flexibility, arguably due to the base-generation status of most of the adverbials in initial position. If the adverbial is base-generated in the C-domain (a typical frame topic) the finite verb will be spelled-out in FinP (as the flexible phase head) and subject pronouns and discourse-given nominal subjects precede the finite verb. If on the other hand the adverbial has been moved from a clause internal position, the phase head must be identified with ForceP and the finite verb is spelled-out there and will precede given nominal subjects and pronominal subjects.

This constitutes the original situation in OE and explains why a language with V2 can allow for V2 orders, V1 orders (no fronted or base-generated constituent) and $V > 2$ orders (one or more base-generated constituents in the C-domain) in the very same functional domain of declaratives clauses.

As laid out above, the decisive factor in the loss of this particular V2 system was the change to functional word status of auxiliaries. This change puts an end to head movement of subject pronouns to Force⁰ and consequently requires the analysis of subject pronouns as free clitics. As we will see below this implies that V2 is lost not only with auxiliaries but also with (short) main verbs. This is not directly visible in the data because V-movement of lexical verbs is generally lost over the same period (Roberts 1985, 1993, Kroch 1989, Warner 1997). However, the shortness of the finite verb is a significant factor in the pertinent change, as shown by the significance of Vf weight for the subperiods of early Modern English in section 4. Moreover, since subject pronouns, like given nominal subjects, are taken to be licensed in the same position, namely in [Spec, FinP], V2 will also be lost with given nominal subjects.

With the prosodic motivation of spell-out of the finite verb in Force⁰ having become obsolete, a simpler analysis in which the finite verb moves to Force⁰ but is spelled-out in Fin⁰ becomes available that leads to a simplifica-

tion of the prosodic licensing of subject pronouns as preverbal free affixes, as is illustrated in (44). Since subject pronouns as arguments form a joint phonological phrase with the verb, as is illustrated in (44b), the correct prosodic structure licensing the subject pronoun, illustrated in (44c), is given for free by the initial prosodic phrasing without requiring other prosodic operations.

- (44) a. Then he came to London
 b. (Than) (he (came)) (to London)
 c. (Than) (Φ σ (Φ came)) (Φ to London)
 d. [_{ForceP} Than [_{FinP} he came [_{TP} to London]]]

Note, however, that in the syntactic analysis of sentence (44) in (44d), the finite verb in FinP can no longer be taken to lexicalize the phase head, which must be Force⁰ (to allow for movement of *then* from a clause-internal position to the initial position). This in turn has the consequence that the system of flexible phase heads is lost, and also, perhaps more importantly, that the unique phase head no longer needs to be taken as lexicalized, allowing for declarative clauses without (overt) V2.

We finally note that there is some comparative evidence for the present account: the same process did not occur in the history of German. In (45), the auxiliary functions as a host for the affixal clitic of the subject, meaning that it represents a prosodic word in the lexicon.

- (45) *Da ist_er nach London gegangen*
 Then is he to London gone

Note in particular that auxiliaries in German were never fully grammaticalized as function words, as they were in English: cases like *He's gone* and *We'll read this book* in which the auxiliary is completely reduced are not possible in German. In other words, the auxiliaries in German always maintained prosodic word status. Moreover, German, though reducing word final vowels, retained unstressed word final syllables (the famous schwa) and did not exhibit a (parallel) change in the definition of the prosodic word and thus retained most of its inflectional morphology.

6 CONCLUSION

Summing up, we have presented a multifactorial analysis of the development of (type 1) V2 patterns following initial adverbs in the history of English. Detailed corpus work presented in sections 2 and 3 showed that the Adverb-Vf-pronoun subject pattern that was restricted to *then*-adverbs in OE, was first

extended to other short, deictic adverbs over the Middle English period, and became increasingly limited to contexts where the finite verb was an auxiliary. This development was shown to be independent from Scandinavian influence in areas where it may be expected. We identified the factors promoting inversion: it was particularly frequent when the initial adverb was short, deictic, unstressed and linked the clause to the discourse context. Inversion was also particularly frequent when the finite verb was monosyllabic, which we see particularly in contexts with auxiliaries. The pattern was lost due to the re-analysis of auxiliaries to functional head status, which resulted in their loss of primary stress. The effect of this was that a clause-initial sequence consisting of a short adverb, an auxiliary and a subject pronoun, which had so far formed a prosodic word, now consisted of three unstressed syllables, violating metrical requirements. While many other syntactic and pragmatic factors contributed to the development, the primary reason for the loss of the pattern was prosodic: the loss of primary stress on auxiliaries.

7 APPENDIX A: DATA SOURCES

Old English

Taylor, Ann, Anthony Warner, Susan Pintzuk & Frank Beths. 2003. The York-Toronto-Helsinki Parsed Corpus of Old English Prose. (YCOE). University of York: Department of Language and Linguistic Science.
<https://www-users.york.ac.uk/lang22/YCOE/YcoeHome.htm>

Middle English

Kroch, Anthony & Ann Taylor. 2000. The Penn-Helsinki Parsed Corpus of Middle English (PPCME2). Department of Linguistics, University of Pennsylvania.
<https://www.ling.upenn.edu/hist-corpora/PPCME2-RELEASE-4/index.html>

Three of the texts were left out of the search:

Wycliffes version of the Old testament, and that of the New Testament, as ongoing research on word order shows that they are strong outliers. Ormulum, because it is the only verse text in the corpus.

One text was added to the search:

Cursor Mundi. Drawn from the Parsed Linguistic Atlas of Early Middle English (PLAEME). <https://datashare.ed.ac.uk/handle/10283/3027> This text is a verse text, but it was added because it is the only text from the North of England that predates the M3 period.

Early Modern English

Kroch, Anthony, Beatrice Santorini & Lauren Delfs. 2004. The Penn-Helsinki Parsed Corpus of Early Modern English (PPCEME). Department of Linguistics, University of Pennsylvania. <https://www.ling.upenn.edu/ppche/ppche-release>

The corpora were converted to xml format, and were searched with Xquery by means of *CorpusStudio* (Komen 2011b) and *Cesax* (Komen 2011a).

8 APPENDIX B: EVIDENCE FROM POETRY

Shakespeare's sonnets (ca. 1600) show some evidence that inversion of pronominal subjects following adverbs occurs in prominent positions in the metre, suggesting that the initial adverb carries primary stress. The sonnets consist of 14 lines divided into three quatrains and one couplet. The couplet concludes the sonnet with a final and crucial perspective. Each line is ten syllables, in iambic pentameter, that is, of five w-s feet. This pattern may be inverted in the initial foot of the line, so that the first foot is s-w, often called trochaic inversion. We cite here two of Shakespeare's sonnets, and a poem from *The passionate pilgrim*, where the lines have four iambic feet with optional trochaic inversion.

Sonnet 26

In sonnet 26, the couplet is introduced by *Then*, followed by an auxiliary and a subject pronoun. Since the couplet is the turning point of the sonnet, this is a robust indication that *then* is stressed, and that we see trochaic inversion here.

Lord of my love, to whom in vassalage
 Thy merit hath my duty strongly knit,
 To thee I send this written embassy,
 To witness duty, not to show my wit:
 Duty so great, which wit so poor as mine
 May make seem bare, in wanting words to show it,
 But that I hope some good conceit of thine
 In thy soul's thought, all naked, will bestow it;
 Till whatsoever star that guides my moving
 Points on me graciously with fair aspect
 And puts apparel on my tatter'd loving,
 To show me worthy of thy sweet respect:
Then may I dare to boast how I do love thee;
 Till then not show my head where thou mayst prove me.

Sonnet 30

Sonnet 30 shows an interesting connection between the initial feet of the three quatrains: the first quatrain begins with a temporal adverbial clause introduced by *when*. Both the second and the third quatrain pick this up with a clause introduced by *then*, followed by an auxiliary and a subject pronoun in the initial foot. This once again suggests trochaic inversion, corresponding between the quatrain-initial lines, with stress on the adverb.

When to the sessions of sweet silent thought
I summon up remembrance of things past,
I sigh the lack of many a thing I sought,
And with old woes new wail my dear time's waste:
Then can I drown an eye, unus'd to flow,
For precious friends hid in death's dateless night,
And weep afresh love's long since cancell'd woe,
And moan th' expense of many a vanish'd sight;
Then can I grieve at grievances foregone,
And heavily from woe to woe tell o'er
The sad account of fore-bemoaned moan,
Which I new pay as if not paid before.
But if the while I think on thee, dear friend,
All losses are restor'd, and sorrows end.

From Shakespeare's *The passionate pilgrim* XIX.

This poem shows the same kind of pattern as sonnet 30, this time with *there* as the initial adverb. It consists of four quatrains, the first three of which seem to be initiated by trochaic inversion with stress on the first syllable. The second and the third quatrain are introduced by *there*-aux-subject pronoun, with primary stress on the adverb.

Live with me and be my love,
And we will all the pleasures prove
That hills and valleys, dales and fields,
And all the craggy mountains yield.

There will we sit upon the rocks,
And see the shepherds feed their flocks,
By shallow rivers, by whose falls

Melodious birds sing madrigals.

There will I make thee a bed of roses,
With a thousand fragrant posies,
A cap of flowers, and a kirtle
Embroidered all with leaves of myrtle.

A belt of straw and ivy buds,
With coral clasps and amber studs;
And if these pleasures may thee move,
Then live with me and be my love.

We tentatively conclude that trochaic inversion may go together with V2 inversion, and leave it to further research to show how robust these patterns are if we cull the poetry of Shakespeare and his contemporaries further.

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Ans van Kemenade
Dept. of Modern Languages and Cultures
Radboud University Nijmegen
6500HD Nijmegen
Netherlands
ans.vankemenade@ru.nl

Roland Hinterhölzl
Dipartimento di Studi Linguistici e Culturali
Comparati
Università Ca'Foscari
Ca' Bembo, Dorsoduro 1075
30123 Venezia
Italy
rolandh@unive.it

Tara Struik
Anglistik IV
Universität Mannheim
B6, 30-32
68159 Mannheim
Germany
tara.struik@uni-mannheim.de
www.tarastruik.nl