Adverbials and Inversion in Early English Scientific Writing[1]

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Introduction

Present Day English (henceforth PDE) is often described as a 'fixed word-order language', where declarative clauses usually occur in the order SVO, except for particular conditions, i.e. the cases of fronting and inversion (Biber et al. 2002: 400; see also Quirk et al. 1985: 51; Carter and McCarthy 2006: 494)[2]. Among the cases of fronting that may be found in the English language, where clause elements that would normally appear after the verb are placed in initial position, Biber et al. have enumerated the following: fronted objects [1], fronted nominals other than object [2], fronted predicatives [3], fronted non-finite constructions [4] and fronting in dependent clauses that use *as* or *though* [5]:

[1] <u>The car</u> I could not see

[2] <u>Whether she liked or not,</u> she would not tell

[3] <u>The longer the stick the easier</u> it will be to hit the ball

[4] I shouted at them and <u>go away</u> they did

[5] <u>Unproductive though</u> they have been in their job

In addition, the canonical SVO structure of PDE can also be altered by different instances of inversion, in which the verb phrase or the operator comes before the subject. These inverted structures have been defined by Green as "semi-frozen relics of processes more productive in an earlier stage of the language" (1980: 598). Thus, the phenomenon is triggered by place/time/negative adverbials [6, 7, 8, respectively] in initial position (Biber et al. 2002: 405-9)[3]:

[6] <u>There</u> comes the train

[7] <u>Then</u> arrived the guests

[8] <u>Neither</u> do I

[2] According to Greenberg (1966: 76), the vast majority of languages have several variant orders but a single dominant one, the most common being VOS, OSV, and OVS.

[3] Biber et al. also identify special cases of inversion which are mainly archaic expressions with literary overtones, such as "May God forgive you your blasphemy' (2002: 409).

From a diachronic point of view, the situation in Old English (OE) sharply contrasts with that of PDE, the latter being basically verb non-final[4] whereas the former is essentially verb-final [9] except in main clauses, where the verb generally moves to second position [10] (Traugott 1992: 274; Fischer and van der Wurff 2006: 182)[5]. This phenomenon, observed in different West Germanic languages, is the so-called V2, where the operator/verb is optionally placed in second position after initial subject or object NPs, an adverbial phrase, etc. (Stockwell 1984: 583; van Kemenade 1987: 42; Traugott 1992: 275; Fischer 1992: 375)[6]. The coexistence of these two word orders in OE has been explained by Hogg in terms of evolution, acknowledging that verb-final is much older than verb-second. This being so, what is witnessed in OE is the "shift away from [verb-final] towards verb-second, [as] when such change occurs, it seems to affect main clauses before subordinate clauses" (2002: 90; see also Fischer 1992: 371).

> [9] ða se Wisdom ða ðis leoð swiðe lustbærlice & gesceadwislice <u>asungen hæfde</u>,
> when the wisdom then this song very pleasantly and wisely sung had
> 'When wisdom had sung this song so pleasantly and wisely'

> [10] ða hæfde ic ða giet hwylchwugu gemynd on minum mode ðære unrotnesse þe ic
> <aer> hæfde
> then had I the still what-little memory in my mind of-the sadness that I before had
> 'I still remembered some of the sadness I used to feel' (Fischer and van der Wurff 2006: 181)

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[4] Traugott argues that PDE still retains some verb-final characteristics such as instances in which the addjective follow the noun (*the only rivers navigable are*) or the famous Saxon genitive, among others. In this vein, Traugott states that these verb-final remnants are due to the fact that the transition from verb-final to verb non-final has not been completed in all parts of grammar, "and so it is far from certain that PDE will ever become rigidly VO" (Traugott 1992: 274).

[5] Fischer and van der Wurff point out that in OE main declarative sentences verb-second is frequent (except in cases when the initial element is a disjunct, sentence adverbial or a clause constituent; and when the subject of the sentence is pronominal). Furthermore, when *þa* is in initial position, verb-second is triggered even with a pronominal subject (2006: 184).

[6] Stockwell (1984: 579-80) lists the different classes of frontable constituents that trigger V2 obligatorily: 1) present participle + complements/modifiers (i.e. *sitting down is Kevin Jones*); 2) past participle + complements/modifiers (i.e. *scheduled to testify were representatives of A, B, and C*); 3) adjective phrase (i.e. *dead in the accident were the chauffeur and his passenger*); 4) predicative PPs (i.e. *at issue is Section 1401 (a) of the Controlled Substances Act*); 5) negative and affective adverbs (i.e. *rarely have I enncountered such beauty*); 6) WH-constituents (i.e. *when can I leave?*); and 6) some comparative markers (i.e. *no sooner was the door closed than the car leaped forward violently*).

The transition from OE to Middle English (ME) is characterized, among other major changes, by the restructuring of word order, English becoming "an almost pure SVO language" (Fischer 1992: 371). This restructuring came out of the necessity to distinguish subject and object NPs after the loss of inflections in all the main word classes. Inversion becomes much more irregular as it could be triggered after many adverbial phrases [11, 12], although the V2 after initial negatives is lost (Fischer 1992: 376)[7].

> [11] Than <u>woll</u> I begyn at A sympill wound that hathe noon of theys vij thyngis (MEMT: Lanfranc Chirurgia Parva)

> [12] here <u>wyll</u> I teche yow practysers a crafte to take out an hawe from the eye be ensample of a cure that I dyd oonys yn Tuskayne in a cite callyd Iuk, where was brou3t to me a man that hade an hawe yn hys ey (MEMT: Benvenutus Grassus)

Early Modern English (EmodE) can be conceived as a transition period within the development of inversion after fronted adverbials (*then*, *yet* or *therefore*, among others) and negative constituents (*never* or *neither*, among others). In this vein, while inversion after advervials suffer a progressive decline during the EmodE period[8], inversion after negative constituents became the rule (Rissanen 1999: 265)[9]. This is conceived by Fischer as "a renewed grammaticalization of the inversion rule after negatives and implied negatives" (Fischer 1992: 376-7; see also Nevalainen 1997: 587)[10]. Jacobsson, in turn, explains it acknowledging that those clauses with a fronted negative constituent may have an emphatic sense where the negative word attracts the predicative verb, hence the occurrence of inversion (1951:16).

The discussion above has showed that adverbials and negative constituents have been particularly decisive in the development of inversion throughout the history of English. Several approaches have been made to this topic in the literature. While Fries (1940) offered an account of the status of inversion in the history of English and Green (1985) assessed the phenomenon in PDE, Jacobsson (1951), Breivik and Swan (1994),

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[7] Van Kemenade argues that " the change from OV to VO is well-documented and must be assumed to have been completed by 1200, [while] the lost of V2 must be dated rather later, around 1400" (1987: 175).

[8] In Jacobsson's approach to inversion after adverbials in EmodE (1951), the sharpest drop takes place around 1600.

[9] According to Nevalainen (2006: 114), the lifting of the verb-second rule also licensed the inversion after clause-initial negative elements, which "gained ground rapidly and became fully established in the seventeenth century".

[10] Risanen argues that "with negative particles and adverbs, such as *never*, *neither*, *nor*, the inverted order seems to become a rule in the seventeenth century; with other adverbials with a negative force, such as *seldom*, *hardly*, somewhat later (Risanen 1999: 265).

Nevalainen (1997), and Bækken (2000, 2005) focused on initial adverbials and word order in EmodE. The phenomenon has not been, as far as I have investigated, tested in scientific writing, a genre that could certainly shed some new light on the diachronic development of inversion in early English. The present paper, therefore, is concerned with those instances of inversion that are triggered by the fronting of adverbials or negative constituents in early English scientific writing with the following objectives: 1) to analyse the occurrence of inversion when adverbials (*then*, *therefore*, *yet*, *thus*) or negative constituents (*ne*, *never*, *neither* and *nor*) occupy the first constituent position both in main and subordinate clauses in ME and EmodE scientific prose; 2) to plot the diachronic development of inversion in the period under study; 3) to investigate the proliferation of the phenomenon across the different text-types; and 4) to evaluate the contribution of conditioning factors such as the typology of the subject or the typology of the clause.

2. Methodology

The present paper analyses the occurrence of inversion when adverbials (*then*, *therefore*, *yet*, *thus*) or negative constituents (*ne*, *never*, *neither*, *nor*) are fronted in early English scientific writing, as they have traditionally triggered inversion at different stages in the history of English[11]. The source of evidence comes from the *Corpus of Early English Medical Writing*: *Middle English Medical Texts* (*MEMT*) and *Early Modern English Medical Texts* (*EMEMT*). These corpora have been selected in the light of the possibilities that they offer when it comes to quantitative and qualitative diachronic studies. While in quantitative terms they amount up to 1,800,000 words[12], an adequate language sample of early English scientific writing; their composition allows for the qualitative analysis from the genre perspective. Furthermore, the time span covered by them constitute an ideal input for the study of inversion after fronted adverbials, being the time in which the principles of Present Day English word order were fixed.

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[11] In the sections that follow, the term adverbial will be used to label the group *then*, *therefore*, *yet* and *thus*; while the term negative will be employed to refer to the group *ne*, *neither*, *never* and *nor*.

[12] The 200-year period covered by *EMEMT* has been further subdivided into four 50-year periods so that diachronic variation can be assessed more accurately.

Corpus	Specialized texts	Surgical texts	Remedies	Total
MEMT	88,349	137,794	219,395	445,538
EMEMT	762,667	298,352	339,068	1,400,087
EMEMT1 1500–1549	59,602	21,910	46,814	128,326
EMEMT2 1550–1599	162,313	102,919	92,405	357,637
EMEMT3 1600–1659	228,135	50,771	71,047	349,953
EMEMT4 1650–1700	312,617	122,752	128,802	564,171

Table 1. Word count for MEMT and EMEMT

MEMT is a corpus of late Middle English scientific writing (1375-1500) containing more than a half million words that belong to three different scientific genres that range from "theoretical treatises transmitting specialised top-level knowledge through learned surgical and anatomical texts to simple recipes for practical use and miscellaneous collections (Pahta and Taavitsainen 2004: 7; see also Calle-Martín and Romero-Barranco 2014, 2015)[13]. *EMEMT*, in turn, amounts up to two million words divided into *general treatises or textbooks*, providing a systematic account of the whole field of medicine; *treatises on specific topics* (texts on specific diseases, on specific methods of diagnosis or treatment, on specific therapeutic substances, on midwifery and children's diseases and on the plague); *recipe collections and materia medica*, containing both remedy books and formalized pharmacopoeias; *regimens and health guides*, comprising texts on preventive medicine; *surgical and anatomical treatises*; and *Philosophical Transactions*, which consist exclusively of medical texts published as letters or articles in the *Philosophical Transactions* of the Royal Society (Taavitsainen et al. 2011: 22-5)[14]. Thus, the material used for the present study allows for the comparison of two different stages in the history of English and also the development of three different genres within scientific writing.

MEMT	*EMEMT*
Specialized texts	*General Treatises or textbooks*
	Treatises on specific topics
Surgical texts	*Surgical and anatomical treatises*
Remedies and materia medica	*Recipe collections and materia medica*
	Regimens and health guides
-	*Philosophical Transactions*

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[13] The category *Verse* has been left out of the present study due to its artificiality.

[14] The categories *Verse* and *Philosophical Transactions* have been discarded in the present paper. While the former is characterised by an artificiality at the service of meter, the latter constitutes a new genre that emerged towards the end of the early Modern English period, hence the impossibility of comparing it to a non-existent Middle English counterpart.

The data for the study were retrieved by means of *AntConc*, which provided all the occurrences of the items under analysis in the corpus. However, the process was not straightforward, as manual disambiguation was needed in order to reduce the number of examples to barely those in which the analysed items appeared at initial position, as in [13] and [14] below, with and without inversion respectively.

[13] neuer in all my lyf \par toke I lesse than an hundred shillyng for cure of that sekenes (*MEMT*: Arderne_fistula).

[14] Thus I let him remaine till the next day following in the morning (*EMEMT*: 1596_Clowes_BookeofObseruations).

3. Analysis

The present section is divided into three parts. Consequently, 3.1 and 3.2 are concerned with the quantitative approach to the phenomenon under analysis as a whole (1350-1700) and from the point of view of genre, respecively. 3.3, in turn, assesses the pehnomenon qualitatively, that is, the contribution of conditioning factors such as the typology of the fronted items (*therefore*, *then*, *thus*, *yet* vs. *never*, *neither*, *ne*, *nor*), the typology of the subject (whether nominal or pronominal), the verbs with which inversion is witnessed, and the type of clause in which the phenomenon occurs.

3.1. Inversion after initial adverbials in early Eng lish scientific writing

This section evaluates the diachronic development of the phenomenon in the period under study. Consequently, Table 3 below reproduces the absolute and relative figures, together with the normalized figures (per 10,000 words), which allow for the comparison between the two historical periods 1350-1500 and 1500-1700.

These figures display the whole corpus of retrieved examples after the process of disambiguation, that is, all the instances in which the analysed items occupy the first position within the clause. A corpus of 3,860 instances of adverbials and negatives occupying initial position within the clause was retrieved, of which 1,018 triggered inversion and 2,842 selected for SVO. These results show two well differenciated tendencies when it comes to fronted adverbials, on the one hand, and fronted negatives, on the other. In *MEMT*, 288 instances of the studied items in initial position were found in the corpus, of which 120 (41.66%) showed inversion. However, a different situation is witnessed between initial adverbials and negatives, as the former cause inversion in 39.2% of the cases and the latter in 46.07%. Therefore, these percentages lead us to conclude

that, in *MEMT*, initial negatives are slightly more prone to trigger inversion than initial adverbials, although in both causes the situation appears to be balanced.

A different tendency is observed in *EMEMT*, where 898 (25.13 %) out of 3,572 instances of fronted adverbials and negatives showed inversion. Within these figures, fronted adverbials cause inversion at a rate of 18.8% and negatives do so in 67.11% of the instances. This being so, it can be safely said that in the early Modern English period SVO is preferred whenever an adverbial is fronted, and that inversion outnumbers SVO after an initial negative constituent.

The normalized frequencies in Table 3 above allow us for the comparison of the two historical periods. Consequently, when it comes to inversion after fronted adverbials, it is nearly four times more frequent in *EMEMT* than in *MEMT* (4.16 and 1.63 instances per 10,000 words, respectively). The case of initial negatives follow the same trend, in which the cases of inversion in *EMEMT* more than double those found in *MEMT* (2.52 and 1.05 instances per 10,000 words, respectively). However, the different rates of SVO in each corpora do not allow us to see the wood for the trees inasmuch as, although the frequency of inversion is much higher in the early Modern English component, what becomes relevant here is the proportion of V2 and SVO within each corpus. Therefore, in the case of fronted adverbials, inversion decreases from 39.2 % in *MEMT* to 18.8 % *EMEMT*. Initial negatives, on the contrary, represent the other side of the coin, where inversion spreads from 46.07% in *MEMT* to 67.11% in *EMEMT*.

In addition to the analysis of the Middle English period and the early Modern English period as a whole, the latter has been subdivided into four 50-year subperiods in order to determine the historical moment in which fronted adverbials ceased to trigger inversion as frequently as they did in Middle English; and initial negatives started to cause it as they had previously done during the Old English period. For the purpose, Figures 1 and 2 display the development of the phenomenon with fronted adverbials and fronted negatives, respectively. The figures have been normalized so that the different subperiods can be compared to each other.

In Figure 1, the normalized frequencies for inversion and SVO after fronted adverbials are represented so that the tendency that they followed throughout the period can be observed. In the case of adverbials not triggering inversion, their frequency remains stable in the four subperiods insofar as it is kept above 18 without exception, even though there is a loss of almost one point if the beginning and the end of the period are compared (19.4 for 1500-1549 and 18.6 for 1650-1700).

Those instances causing inversion, nevertheless, show a rather different picture characterized by a decrease in the rates of inversion. Thus, whereas the frequency of inversion was 7.87 instances per 10,000 words at the beginning of the period, by the end of it the cases of inversion amount up to 2 per 10,000 words. Albeit inversion loses ground subperiod after subperiod in early Modern English, the more pronounced fall occurs after the year 1650, when inversion suffers a drop-off of 2.65 instances per 10,000 words, from 4.65 in the period 1600-1649 to 2 in 1650-1700. The frequencies in Figure 1 demonstrate that the phenomenon was in decline as, while those instances not triggering inversion remained immutable, those causing inversion did nothing but decrease.

Figure 2 displays the normalized frequencies for inversion after fronted negatives so that any diachronic development can be analysed. In the case of fronted negatives in which SVO is maintained, there is a general decrease throughout the period (from 2.8 to 0.93 instances per 10,000 words in the periods 1500-1549 and 1650-1700, respectively). Within this tendency, the more dramatic decrease is observed after the year 1550, when SVO loses 1.46 instances per 10,000 words.

The drop-off suffered by the structures selecting for SVO coincides with a progessive increase in the instances showing inversion after fronted negatives (from 0.31 to 3.77 instances per 10,000 words in the periods 1500-1549 and 1650-1700, respectively)[15]. The most significant increase is observed after the year 1550, when inversion gains 1.56 instances per 10,000 words. After this period, the number of instances showing inversion stays consistent until the end of the period, when they spread widely from 1.97 to 3.77 instances per 10,000 words in the periods 1600-1640 and 1650-1700, respectively.

3.2. Genre variation: the different text types

The present section aims to evaluate the phenomenon under study in the light of the different text types contained in the corpora. As was mentioned in Section 2, the corpora under study in the present paper belong to the genre of scientific writing, which started to

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[15] The transition from SVO to inversion after fronted negative constituents is represented by the divergences in the number of instances at the beginning and at the end of the early Modern English period. Thus, in the period 1500-1549, the instances of SVO surpass those of inversion with 2.8 over 0.31 instances per 10,000 words. However, by the enf of the period 1650-1700, the instances of inversion have spread and outnumbered those of SVO, with 3.77 over 0.93 instances per 10,000 words.

be produced in English during the 14th century[16]. Thus, while in the initial phases of the process English would occur together with Latin and/or French in bi- or trilingual volumes, by the end of the fifteenth century "there was a full range of vernacular medical texts available in English-language manuscripts in which Latin played little or no role" (Pahta 2001: 209)[17].

Scientific writing in ME was, therefore, highly influenced by the scholastic Latin and/or French texts from which they were translated, which relied mainly on classical authors such as Galen or Hippocrates (Taavitsainen and Pahta 1998: 162). In EmodE, in turn, new ways of constructing knowledge emerged, based on observation and cognition. This methodological change had its consequences on the language by which science was transmitted as, according to Taavitsainen (2011: 123-31), genres "constitute dynamic systems that undergo change and variation over the course of time as sociocultural needs change, and genres change accordingly: old genres are adapted to new functions, new genres are created, and genres that have lost their function cease to exist (Taavitsainen 2001: 141, 2009: 38)[18].

The number of instances showing inversion after fronted adverbials has been calculated across text types in Table 4 below, together with the normalized frequencies. It can be observed from the table that both ME and EmodE follow the same tendency, as SVO after a fronted adverbial is the commonest choice in all the text types. In terms of frequency, it could be said that *EMEMT* shows a higher number of instances of SVO than *MEMT* (18.54, 18.73 and 15.86 over 8.82, 1.37 and 0.72 instances per 10,000 words in *specialized texts*, *surgical texts* and *remedies*, respectively). Those instances of inversion, nevertheless, are more likely to be found in *specialized texts* in *MEMT* (4.86 over 4.22 instances per 10,000 words, respectively) and in *surgical texts* and *remedies* in *EMEMT* (2.91 and 5.13 over 1.23 and 0.59 instances per 10,000 words, respectively).

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[16] During the last part of the fourteenth century, the translation of the Latin, Greek and Arabic scientific material into the vernacular started to proliferate, a fact that made English eventually become the language of science (Taavitsainen 1994: 329, 2002: 205; Taavitsainen and Pahta 1998: 157; Pahta 2001: 208)

[17] Pahta and Taavitsainen distinguish three phases in the vernacularization of English: 1375-1475, 1475-1550, and 1550-1700. See Taavitsainen and Pahta (2004) for the period 1375-1500, that is, late ME; and Taavitsainen and Pahta (2011) for the period 1500-1700, i. e. EmodE.

[18] This scientific language switch, however, had its social consequences. On the one hand, knowledge would be available "for a wider readership", namely illiterate or just unlatined people (Pahta and Taavitsainen 2004: 1-2). On the other, the transition from Latin to Middle English would join the relatively few university-trained physicians, who undestood Latin, from the unlatined others, i. e. the on-the-job trained surgeon, the barber-surgeon or the apothecary, among others (Robbins 1970: 394).

When it comes to fronted negative constituents, ME and EmodE follow divergent trends in such a way that the former is less likely than the latter to show inversion. This being so, the rates of inversion are higher in *EMEMT* (2.55, 2.11 and 1.68 over 1.58, 1.66 and 0.45 instances per 10,000 words in *specialized texts*, *surgical texts* and *remedies*, respectively). The instances of SVO, in turn, are more likely to occur in *specialized* and *surgical texts* in *MEMT* (1.35 and 2.17 over 1.20 and 0.63 instances per 10,000 words, respectively) and in *remedies* in *EMEMT* (1.53 over 0.54 instances per 10,000 words).

Figure 3 below shows the percentages of inversion and SVO after fronted adverbials across the different text types in *MEMT* and *EMEMT* so that the preferences in each genre and period can be analysed. As can be observed, in *MEMT* inversion is the preferred structure with 64.4%, 52.8% and 55.2% over 35.5%, 47.2% and 44.8% in *specialized texts*, *surgical texts* and *remedies*, respectively. Additionally, *EMEMT* presents the same picture, as inversion outnumbers SVO irrespective of the text type in which the text is written. Although both ME and EmodE follow the same tendency, it must be noted that inversion is more widely preferred in *EMEMT* than in *MEMT* text types. Whereas in the former the inversion rate is always over 75%, in the latter the two alternatives are balanced in *surgical texts* and *remedies* (52.8% and 55.2%, respectively) and inversion is clearly the choice in *specialized texts* (64.4%).

When the fronted element is a negative constituent, a different situation is observed. Figure 4 below displays the rates of inversion and SVO across the different text types in *MEMT* and *EMEMT*. Consequently, in *MEMT* inversion is preferred in *specialized texts* (53.8%), while *surgical texts* and *remedies* opt for SVO (56.6% and 54.5%, respectively), with a quite balanced rate though. In *EMEMT*, on the contrary, inversion is favoured in *specialized* and *surgical texts* (67.9% and 76.8% over 32.1% and 23.2%, respectively), while inversion is preferred in *remedies* (52.2% over 47.8%).

In addition to the analysis of inversion in the different text types as a whole, Figure 5 provides the classification of the instances, normalized to 10,000 words, according to the four subperiods in which *EMEMT* has been previously subdivided. As shown, in all cases, the rate of SVO structures are kept over 10 instances per 10,000 words, while those of inversion are below 2 instances per 10,000 words by the end of the EmodE period. Therefore, it can be said that the drop-off of inversion was a general tendency that affected all EmodE text types, where a progressive drop-off of inversion is observed.

The situation of inversion after fronted negative constituents resembles that of fronted adverbials, albeit 50 years later. Thus, inversion after fronted negative constituents

is adopted after 1550, when inversion outnumbers SVO with 2.2, 1.4 and 1.6 over 1.8, 0.5 and 1.2 in *specialized texts*, *surgical texts* and *remedies*, respectively. Even though this distribution is somewhat levelled, inversion remains the preferred form until the end of the EmodE period, which ends with rates of inversion above 3.4 and rates of SVO below 1.