



Article

"Arguments That Could Possibly Be Urged": Modal Verbs and Tentativeness in the Coruña Corpus

Isabel Moskowich * and Begoña Crespo *

Departmento de Letras, Universidade da Coruña, 15071 A Coruña, Spain

* Correspondence: imoskowich@udc.es (I.M.); bcrespo@udc.es (B.C.)

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Abstract: This paper complements previous research into the late Modern English scientific writing uses of the adverbs *possibly* and *perhaps* as manifestations of either subjectivity or intersubjectivity, as presented in the *Coruña Corpus of English Scientific Writing*. In order to have a better understanding of the uses of these adverbs as markers of tentativeness, we will explore their syntagmatic relations with modal verbs. It is widely assumed that scientific discourse has an objective nature, although it has been questioned by its use of hedging and other expressions of stance. In the present study, we will assess how modal verbs accompanying these stance adverbs modulate the expression of tentativeness. The use of stance adverbs shows authorial presence and a covert interaction with the reader. The paper examines different degrees of hesitancy depending on the type of modal verb accompanying these adverbs. The analysis has been carried out on four subcorpora of the *Coruña Corpus of English Scientific Writing*. Our findings will be presented from a more general to a more detailed account for each of the forms under investigation and interpreted taking into account the variables 'date of publication' and 'genre' for the text, and 'sex' for the author.

Keywords: modals; late Modern English scientific writing; Coruña Corpus

1. Introduction

This paper aims to complement previous research into the uses of the adverbs *possibly* and *perhaps* as manifestations of either subjectivity or intersubjectivity, looking specifically at late Modern English scientific writing, as presented in the *Coruña Corpus of English Scientific Writing*.

In the current study, we will be using the same material. However, in order to go a step further, we will explore the syntagmatic relations of these two adverbs and their accompanying modal verbs. Although it is widely assumed that scientific English has shifted from author-centered to object-centered (Atkinson 1998), the presumably objective nature of scientific discourse has in fact been questioned, with the use of hedging (Hyland 1998) and other elements expressing stance (Moskowich and Crespo 2014; Alonso Almeida and Inés 2016; Dossena 2017) cited as evidence here. In the present study, we will continue our description of late Modern English scientific writing by assessing how the modal verbs accompanying these stance adverbs can modulate the expression of tentativeness. *Perhaps* and *possibly* both indicate an author's desire to show tentativeness and uncertainty, as well as being devices that seek the reading public's involvement in the presentation of content (Seoane Posse 2016). The use of stance adverbs of this kind not only shows authorial presence, but also demonstrates a covert interaction with the reader, which makes these texts more engaging for the latter.

We will consider how different shades of meaning and degrees of tentativeness/hesitancy arise depending on the type of modal verb accompanying these two adverbs. To this end, Section 1 will introduce our research questions, and will also deal with a number of considerations that seem to be necessary in order to carry out our analysis. Section 2 provides a description of the linguistic material to be used in the analysis: four subcorpora of the *Coruña Corpus of English Scientific Writing: Corpus of*

English Texts on Astronomy (CETA), Corpus of English Philosophy Texts (CEPhiT), Corpus of History English Texts (CHET), and Corpus of English Life Sciences Texts (CELiST); this section also includes information on the analysis itself. The findings will be set out in Section 3, from a more general to a more detailed account for each of the forms under investigation. In Section 4, we will interpret and discuss the results in the light of the following variables: time of publication, sex of the author, and genre or discursive format of texts. Finally, some conclusions will be offered in Section 5.

2. Previous Considerations and Research Questions

Those engaged in the study of scientific writing in English and its evolution generally accept that there has been a broad shift from an author-centered perspective to one that focuses on the object described or studied. Atkinson's work on the *Philosophical Transactions* (Atkinson 1998) seems to prove this beyond doubt. However, such a claim does not mean that, after three centuries of evolution, present-day scientific writing is entirely dry and objective; indeed, it has been shown that it contains hedging (Hyland 1998) and expressions of stance in different forms (Moskowich and Crespo 2014; Alonso Almeida and Inés 2016; Dossena 2017).

Our first approach to the use of *possibly* and *perhaps* as stance adverbs (in a paper presented at the annual AESLA Conference in 2018) involved an analysis of authorial presence and subjectivity in late Modern scientific discourse. In that paper, we concluded that these adverbs were more often used to express subjectivity than intersubjectivity, and that such use increased over time. In the current paper, we aim to go one step further, asking whether the syntagmatic relations of these adverbs with modal verbs also exhibit traces of tentativeness; this was understood to be one of the manifestations of author subjectivity.

Our starting point will be the definitions for *perhaps* and *possibly* in the *Oxford English Dictionary* (*OED* henceforth). Thus, perhaps is defined as: "Expressing a hypothetical, contingent, conjectural, or uncertain possibility: it may be (that); maybe, possibly" (*OED*). We also know that its origin is Germanic. In turn, *possibly* originates from Romance, and is defined as: "In a possible manner; in accordance with what can or may exist, occur, be done, etc.; within the range of possibility; by any existing power or means, in any possible way. Chiefly, now only, used as an intensifier of *can* or *could*" (*OED*).

Moreover, as Álvarez-Gil (2019, p. 49) has argued, *possibly* indicates "a low level of authorial commitment to text content by presenting information with doubts and hesitancy". He argued that the authors combine this form with may, might, and could to indicate different levels of likeliness of the events to be true. This combination of the modal and possibly may mean either that the author lacks the necessary evidence for the conclusion presented, or it may be a negative politeness strategy to avoid imposition. The use of this adverb suggests the authors' need to protect their public image rather than a real evaluation of the state of affairs. That is, even if they rely on solid ground to assert a particular conclusion, it possibly adds an extra rhetorical effect to enhance the epistemic meaning as realized by the accompanying modals. (Álvarez-Gil 2019, p. 70)

It also seems in order to offer the meanings of modal verbs in present-day English (see Table 1 below) according to Quirk (1985), bearing in mind that such meanings do not differ extensively from the ones to be found in the late Modern English period (Millward and Mary 2011).

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Modal Verb	Meaning	Paraphrasis
May	epistemic possibility "It denotes the possibility of a given proposition's being or becoming true."	perhaps or possibly
Might	epistemic possibility, but more tentative than may	
Can/could	possibility (future possibility)	it is possible + inf clause
Shall	prediction, volition (with first person)	
Should	obligation	
Will/would	prediction, volition	

Table 1. Meaning of modal verbs (according to Quirk 1985).

These meanings are present in the use of modals in late Modern scientific texts, as can be seen in the following examples from the *Coruña Corpus of English Scientific Writing*:

- (1) which take place in the maturation of the ovum may <perhaps> be most conveniently displayed by following the history of a... (Balfour 1880, p. 55)
- (2) so different from what man at first imagines it may <perhaps> have startled them but in this view there is nothing (Whewell 1858, p. 38)
- (3) of secretions that they are the greatest arguments that could <possibly> be urged for the truth of it nothing does more (Keill 1717, p. 132)
- (4) causes and effects of several phenomena which future ages may <possibly> discover most of these birds of passage never fail to (Hughes 1750, p. 76)

Although it might be thought that the definitions and uses provided cannot be applied to our findings for late Modern English, given that there is a gap of two centuries between the material in our study and Quirk et al.'s work, the meanings of modals do not seem to have changed, at least in terms of their frequency of occurrence (Leech 2004).

The following section will present the linguistic material for our survey and the methodology used.

3. Corpus Material and Methodology

The material used for the present study (see Table 2 below) has been taken from the *Coruña Corpus* of English Scientific Writing (CC). More specifically, we have used four subcorpora: Corpus of English Texts on Astronomy (CETA), Corpus of English Philosophy Texts (CEPhiT), Corpus of History English Texts (CHET) and Corpus of English Life Sciences Texts (CELiST). Two of these represent disciplines pertaining to the so-called soft sciences, while the other two represent the hard sciences.

Subcorpus	Discipline	Words
CETA	Astronomy	409,909
CHET	History	404,424
CEPhiT	Philosophy	401,129
CELiST	Life Sciences	400,305
Total		1,615,767

Table 2. Word count per subcorpus.

Since sex of the author is one of the variables we will be using, the distribution of words by male and female authors in our material is displayed in Figure 1 below. This distribution reflects the situation of scientific text production in the Modern period:

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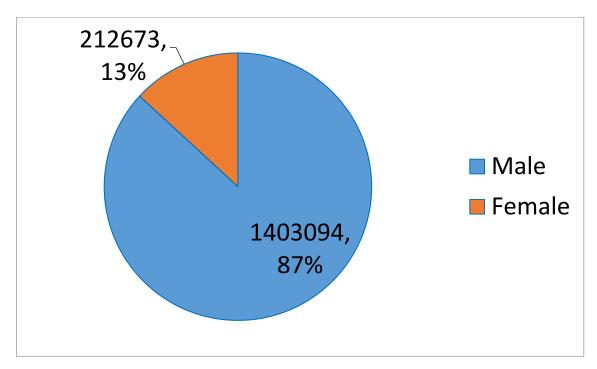


Figure 1. Words per sex of author.

Much more variety can be found in terms of genre or communicative format. There are 12 different formats in the four subcorpora, these being unequally represented, in that not all of them were equally popular during the period. This can be seen in Figure 2:

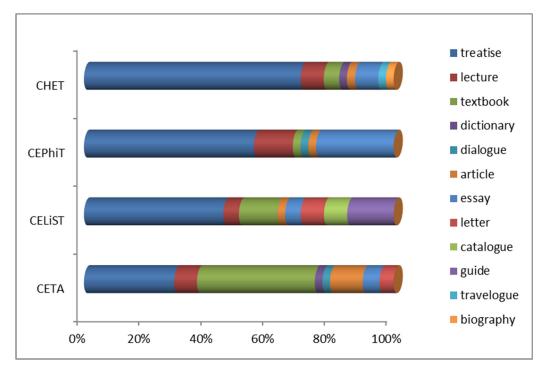


Figure 2. Words per genre.

As for the analysis itself, all cases of the adverbs *possibly* and *perhaps* in the subcorpora were considered, but only those containing a modal verb accompanying the adverbs in question were then taken into account. Thus, we focused on examples such as the following:

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(5) If the time shall ever arrive, when the facts of natural history are given, without admixture with fable, the world will be more rapidly and satisfactorily advanced in improvement than can <possibly> be hoped for (Godman 1828, p. 29)

- (6) rational horizon does not amount to a few seconds or <perhaps> not so much as one second of a minute and (Long 1742, p. 64)
- (7) bodies have not so far been satisfactorily observed it is <perhaps> possible that the part removed in the formation of the (Balfour 1880, p. 63)

The *Coruña Corpus Tool* was used to search for all the tokens of the adverbs under survey in the subcorpora. Given that we were interested in looking into the behavior of such adverbs with different types of modals, it was necessary to manually disambiguate each case. This involved a close reading of all the hits, which had previously been collected in a spreadsheet (MS Excel for Mac, version 16.24). Then, the examples that were to be used in the analysis were enriched through the addition of fields including information on the author, his or her sex, the year of publication of the text in question, and the genre to which it belonged.

4. Findings and Discussion of Results

The data will be presented here from the more general to the more specific. Starting with the general findings for the adverbs (as set out in Table 3 below), we can see that their use in the four disciplines certainly differs. Totals for the raw numbers have been normalized as a means of making comparisons clearer.

Raw Figures						Total (NF/10,000)
Forms	CHET	CEPhiT	CETA	CELiST	Total	3.61
Possibly	20	46	24	25	115	0.71
Perhaps	76	212	64	117	469	2.90

Table 3. Frequency of *possibly* and *perhaps* in the subcorpora.

This analysis of the adverbs is enhanced when the accompanying modal verbs are taken into account. Table 4 shows in raw numbers that *may*, with the meaning of possibility, is the most frequent modal verb in all the disciplines apart from History, where *might* is found most often. *May*, as shown in Table 5, repeatedly occurs in combination with *perhaps*, which can be interpreted as a reinforcement of the uncertainty that accompanies "the possibility of something becoming true". This form of strengthening might be taken as the conscious presence of the author, who thus manifests his/her attitude toward a particular statement.

CELiST CEPhiT CETA CHET TOTAL may might can could shall should will would TOTAL (modals/subcorpus)

Table 4. Adverbs and accompanying modal verbs.

Note: Pink colour has been used to highlight the most frequent results; blue colour highlights the least frequent results.

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	CELiST	CEPhiT	CETA	CHET	TOTAL
may	24	32	15	4	75
might	6	10	0	7	23
can	3	3	0	2	8
could	0	0	0	0	0
shall	0	3	1	0	4
should	0	2	0	0	2
will	3	13	1	0	17
would	3	9	4	0	16
TOTAL	39	72	21	13	145

Table 5. *Perhaps* and accompanying modal verbs.

It is also interesting to note that it is in the History discipline that the lowest number of modal verbs with the two adverbs in question are found. This is surprising, in that History, together with Philosophy, represents the so-called soft sciences, where more authorial presence is expected to be found (Hyland 2005); such disciplines are considered to be more prone to subjectivity than those of the hard sciences.

Curiously, as set out in Table 5 below, *may* is more frequently used in combination with *perhaps* in Philosophy texts, which are more amenable to the inclusion of the expression of feelings, opinions, or ideas; however, it is also found in CELiST, as a representative of the hard sciences, which is an unexpected finding.

As for the form *possibly*, we have found that, although occasionally used with other modal verbs, it occurs most frequently with *can* and *could* to express the certainty of a possibility (Crespo forthcoming). Table 6 below displays this information in some detail for each subcorpus.

	CELiST	CEPhiT	CETA	CHET	TOTAL
May	7	5	5	2	19
Might	0	4	0	2	6
Can	6	23	9	1	39
Could	2	11	7	6	26
Shall	0	0	0	0	0
Should	0	0	0	0	0
Will	0	0	1	0	1
Would	0	0	0	0	0
TOTAL	15	43	22	11	91

Table 6. Possibly and accompanying modals.

Once again, History is the discipline that exhibits the fewest cases of modals + *possibly*, which might account for the assertiveness and scant authorial presence in these texts. The collocation modal + stance adverb does not seem to be a mechanism to manifest the author's value judgement or stance on a narrated event or fact.

We believe, along with Biber (1991), that scientific English contains more variation than traditionally believed. Therefore, we have decided to interpret our findings in the light of three extralinguistic variables that have proved very useful in other pieces of research carried out with the *CC* (Monaco 2016; Puente-Castelo 2017): the date of publication of a text, the sex of the author, and the communicative format of the piece. Each of these variables will be discussed in what follows.

4.1. Adverbs, Modals, and Time

As noted above, we have used data from two subperiods—the 18th and the 19th centuries, for all subcorpora, and we have found different behaviors in *possibly* and *perhaps* over these two centuries. As Tables 7 and 8 show, there is an increase in the use of *perhaps* of 36.86% from the 18th century (with 198 tokens) to the 19th (with 271).

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Table 7.	Use of	perhaps	ın	time.
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Perhaps	Period		
Pernups	18th c.	19th c.	
	198	271	

Table 8, however, shows that *possibly* is used less frequently over time, although this decrease is very moderate:

Table 8. Use of *possibly* in time.

Possibly -	Period		
rossiony -	18th c.	19th c.	
	59	56	

The fact that *perhaps* is more frequently used in the second subperiod under analysis might confirm greater authorial presence in scientific writing over time. Authors, it seems, are still present in their work, and this contradicts one of the initial assumptions cited in Section 1: that scientific writing moves from an author-centered to an object-centered sphere. Authors always have a voice, to a greater or lesser degree, however necessary or important the description of an object, event, or process might be. This explanation cannot account for the decrease in the use of *possibly* unless we consider it as some kind of complementary distribution—that is, *perhaps* replacing the use of *possibly*.

When we look into how the two adverbs behave and whether they tend to occur in structures with modals or not, we find a very slight decrease in both cases.

Figure 3 shows that *possibly* occurs in the same structure as a modal verb more often in the 18th (54 tokens) than in the 19th century (37), there being a moderate decrease in the latter. By contrast, *perhaps* behaves in practically the same way in both subperiods, with 73 occurrences for the 18th century and 72 for the 19th.

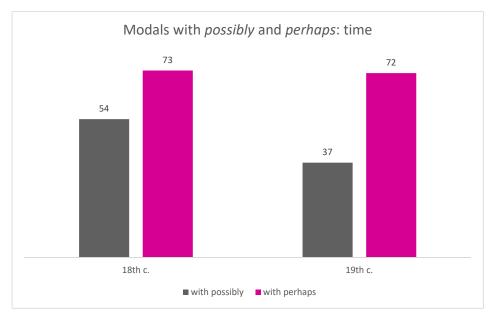


Figure 3. Distribution of adverbs with modals in time.

4.2. Adverbs, Modals, and Sex

Our expectations regarding the adverbs under discussion here in terms of the sex of the author were that women would probably use them more, as a means of mitigating their claims. Normalized

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figures were again used here, since there are substantially fewer words produced by women than by men in the *CC*, this being a matter of representativeness (far more men published scientific works in the late Modern English period). Our results (Figure 4) show—contrary to our initial hypothesis—that female authors tend to use the adverbs *possibly* and *perhaps* more often on their own than when accompanied by a modal verb, which reveals that they do not use mitigation as often as their male peers. This might be explained by them having felt the need to be more assertive if they want to be taken seriously in a highly androcentric world.

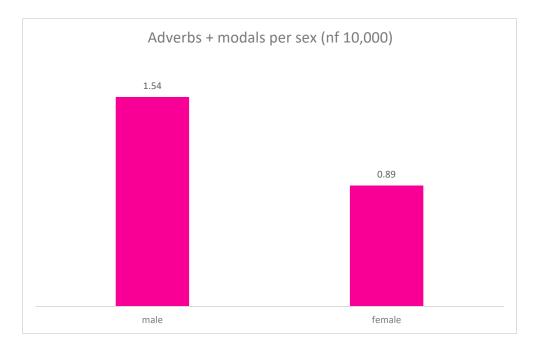


Figure 4. Use of adverbs with modals per sex.

On closer inspection, and taking the two adverbs separately, the same pattern is replicated, in that both *possibly* and *perhaps* are used less often by women. This is illustrated in Figure 5, as well as female writers (on the right) using fewer of these forms in general, as we had already noted.

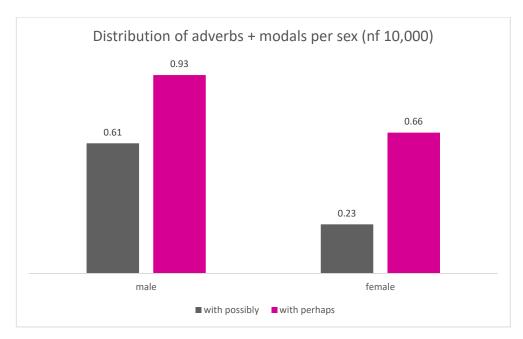


Figure 5. Use of *perhaps* and *possibly* per sex.

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4.3. Adverbs, Modals, and Communicative Formats

Previous research (Crespo and Moskowich 2016; Moskowich 2017) has shown that both subject matter and communicative format or genre exert a great influence on linguistic choice. The genres included in the *CC* cover different degrees of formality and proximity to the oral register. Thus, we find samples extracted from Lectures, Dialogues, and Letters (speech-based genres) and others such as Textbooks, Treatises, or Travelogues, which are typically written to be read. We have analyzed the behavior of *perhaps* and *possibly* separately, since although the *OED* gives a very similar meaning for both, which might imply similar kinds of use, the results for the previous variables have led us to prefer a separate analysis, this as a means of seeing whether they would also behave differently or not here.

Thus, the adverb perhaps was taken first, and a search was made for all those instances in which it was accompanied by modal verbs in the 12 different genres represented in our material. Figure 6 illustrates the very varied distribution that we found. On the one hand, Essay (2.19 nf) and Lecture (1.45 nf) are the two formats that contain the highest number of occurrences of *perhaps* when accompanied by a modal verb. It is to be noted that both formats are close to orality, in that lectures are conceived of as pieces of writing to be read out, and essays were originally the reports of the public demonstrations of experiments. Such characteristics of these formats may explain the preference for an adverb of Germanic origin such as perhaps. On the other hand, from the 12 genres, four contained no instances of these constructions, this being the case with Dictionary, Catalogue, Travelogue, and Biography. Curiously, these are discipline-specific genres, in that Biography and Travelogue are exclusive to the History corpus, and Catalogue has thus far only been found in the Corpus of English Life Sciences Texts (under compilation). Meanwhile, Dictionary—a format that can also be found in other disciplines—is represented here by a sample in CETA (Astronomy). It is also true that although the form and function of both Catalogue and Dictionary do not seem to be likely to contain structures such as those we are dealing with, the other two (Travelogue and Biography) might indeed be expected to contain some instances precisely because of their nature.

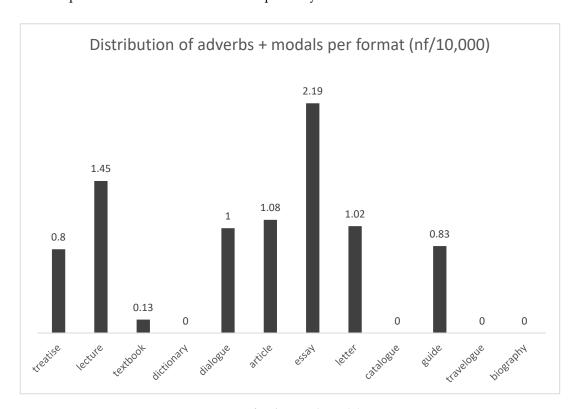


Figure 6. Use of *perhaps* with modals per sex.

Our analysis of *possibly* with modal verbs reveals that it also behaves differently depending on the oral-like character of the genres in question. Biography is the format containing most of these structures (1.49 nf), followed by Article (1.35 nf). Conversely, Dialogue and Travelogue contain no cases at all, whereas other, more oral-like genres, such as Lecture and Essay, exhibit only 0.15 nf and 0.8 nf, respectively. The frequent use of *possibly* in genres written to be read (rather than read out orally) may be the result of the word's Romance origins, which is typical of more formal and written texts (Figure 7). Therefore, it seems plausible to assume that both adverbs occur in complementary distribution.

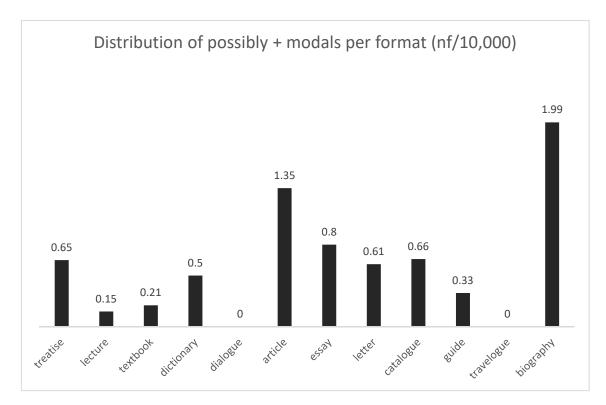


Figure 7. Use of *possibly* with modals per communicative format.

All the results presented above—both those of a general nature and those in which the three different extralinguistic variables have been considered—seem to contradict what we know about modal verbs, their meanings, and their uses.

5. Conclusions

Our survey of the occurrence of *possibly* and *perhaps* with modal verbs has shown that all the verbs under study are recorded in our material. However, clearly different distributions with the two adverbs have been found: *perhaps* occurs more frequently in constructions with *may*, whereas *possibly* tends to appear with *can* and *could* more often.

As in previous research, we have found that *perhaps* is more abundant in our material than *possibly*. We have also seen that it is more frequently used in oral-like formats, which may be due to its etymology, in that Germanic words are often considered more appropriate for less formal registers. For the same reason, we have seen that *possibly*, of Romance (ultimately Latin) origin, appears more frequently in formats addressed to a specialized reading public, such as Articles.

Incidentally, our study also reveals that, contrary to the *OED*'s definition of *possibly* ("Chiefly, **now** only, used as an **intensifier of** *can* **or** *could*"), the word was already used with this intensifier function as early as the 18th century, at least in scientific writing. The question of whether this is due to its etymological provenance (and perhaps not felt by speakers to be so naturally their own), and also what kind of behavior these adverbs may have in non-scientific writing, must be left for future research.

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List of Corpora: Coruña Corpus of English Scientific Writing formed by Corpus of English Texts on Astronomy (CETA), Corpus of English Philosophy Texts (CEPhiT), Corpus of History English Texts (CHET) and Corpus of English Life Sciences Texts (CELiST).

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