

**The Complex Nature of English Modality:
A Historical Study on the Root and Epistemic Meanings of *Must***

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Tämän tutkielman tarkoituksena on tarkastella englannin kielen apuverbin *must* eri merkityksiä sekä sitä, miten sen käyttö on muuttunut viimeisen kolmen vuosisadan aikana. Lähemmän tarkastelun kohteena on jaottelu kahden keskeisen merkityksen välillä. Jatkumon toisessa ääripäässä sijaitsee välttämättömyyttä ja pakkoa ilmaiseva modaalisuus, kun taas toisessa ääripäässä on mahdollisuutta ja päättelyä ilmaiseva modaalisuus. Koska välttämättömyyttä ja pakkoa ilmaisevalle modaalisuudelle on usein tunnusomaista ”sumeat” merkitykset, tutkimuksessa esitellään myös joukko alamerkityksiä, joiden avulla voidaan ilmaista erilaisia voimakkaan tai heikon välttämättömyyden ja pakon vivahde-eroja. Tutkimuksen kannalta erityisen keskeisiä ovat kaksi alamerkitystä: hyvin voimakasta pakkoa ilmaiseva merkitys sekä hyvin heikkoa pakkoa ilmaiseva merkitys, johon yleisesti yhdistetään sanomiseen tai havaitsemiseen liittyvät verbit. Näiden kahden merkityksen väliin jäävät muut merkitykset on sisällytetty keskenään samaan kategoriaan.

Tutkimuksen aineistona on käytetty kahta korpusa. Toinen korpus, the Corpus of Late Modern English Texts (CLMET), on jaettu kolmeen eri osaan siten, että jokainen osa kattaa tekstejä 70 vuoden ajanjakson osalta. Toinen korpus, the Lancaster-Oslo/Bergen Corpus (LOB) edustaa nykyenglannin kirjoitettua kieltä. Yhteisenä piirteenä mainittakoon, että molemmat korpuksot sisältävät vain yhden alueellisen variantin, Britannian englannin, kirjoitetun kielen tekstejä. Hakutermin ”must” avulla korpuksista löytyi yhteensä 14 975 esimerkkiä, joista analysoin 1 643 esimerkkiä.

Tutkimustulokset osoittavat, että välttämättömyyttä ja pakkoa ilmaiseva merkitys on hyvin yleinen historiallisissa teksteissä, mutta sen käyttö vähenee selvästi nykyenglannin esimerkkejä analysoitaessa. Myös mahdollisuutta ja päättelyä ilmaisevan merkityksen osuus kasvaa suhteessa edellisiin korpuksiin. Tämä on selkeä osoitus siitä, että usein hierarkiseen ja vanhahtavaan tyyliin liitettävä välttämättömyyden ja pakon merkitys on vähitellen korvautumassa muilla, sosiaalisesti tasa-vertaisimmilla ja demokraattisemmilla muodoilla.

Tutkimus paljastaa myös sen, miten läheisesti alamerkitykset sekä niiden käyttö liittyvät apuverbin *must* merkitysten tulkintaan. Kiinnostavin huomio on se, että hyvin voimakasta pakkoa ilmaiseva alamerkitys kukoistaa historiallisissa teksteissä, mutta käyttö laskee äkillisesti nykyenglannin teksteissä. Heikkoa pakkoa ilmaiseva alamerkitys ei kuitenkaan muutu yleisemmäksi. Sen sijaan muut alamerkitykset, jotka ilmaisevat melko heikkoa pakkoa, osoittavat huomattavaa yleistymistä siirryttäessä kohti nykyenglantia.

Asiasanat: apuverbi, *epistemic*, korpuslingvistiikka, *must*, *root*

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1. Introduction

The aim of this thesis is to study the different types of meanings which can be distinguished for the modal auxiliary *must*. In order to discuss these meanings, various grammars and other research literature will be consulted. In addition, I am going to conduct a corpus-based study utilizing two corpora, one which represents more historical and the other which represents more recent English. These corpora are the Corpus of Late Modern English Texts and the Lancaster-Oslo/Bergen Corpus respectively. Thus, I will analyze whether the use of *must* have changed in the course of the last three centuries.

In this study, I am going to study certain distinctive syntactic properties characteristic of all the English auxiliaries. These are called the NICE properties (first introduced by Huddleston 1976). However, since I am interested in the meanings of the modals and particularly that of *must*, I will concentrate mainly on the semantics rather than the syntactical features.

As regards the modal *must*, I am going to examine the two main senses distinguished for *must*, those of root and epistemic ones. The former expresses obligation and compulsion, as in *John must be home by ten; Mother won't let him stay out any later*; whereas the latter expresses possibility and inference, as in *John must be home already; I see his coat*. (examples are from Sweetser 1990, 49). Moreover, I will argue that although the distinction between the root-epistemic domain is rather clear, the notion of 'fuzziness' can be related to the root meanings of *must*. In other words, there are a range of sub-meanings associated with root sense which express a differing degree of compulsion. This makes the analysis more challenging as well as complicated.

The corpus data of this thesis consists of written British English texts only.

Although I am not going to use matching corpora representing two different regional varieties in order to add a comparative aspect into this thesis, it is justifiable to say that my study will serve its purpose. First of all, linguists have often concentrated only on the theoretical aspects concerning the meanings of *must*. Secondly, the use of *must* has only been examined by using corpora representing more recent English. Finally, there is no evidence of a similar kind of a study covering the period from the 18th century all the way to the 1960s. Therefore, it is important to conduct a long-period diachronic analysis which focuses on the use of *must* in greater detail.

2. Research data and method

To begin with, a short definition of a corpus is quite in place. According to Kennedy (1998, 1), a corpus can be defined as “a body of written text or transcribed speech which can serve as a basis for linguistic analysis and description”. Different types of corpora have been of interest for many, and the corpora have been used as a tool in analysing language, for they provide a rather straightforward way to study a linguistic variety (Kennedy 1998, 4).

As Biber et al. (1998, 203) point out, there has been an increasing interest in using corpus-based techniques in the field of historical linguistics. Previously there were problems relating to historical investigations because of “the absence of representative historical corpora” (ibid.). Since some major improvements have taken place in the field of historical linguistics in recent years, I have gathered data for this thesis from one historical corpus called the Corpus of Late Modern English Texts, which is also known as the Leuven corpus. In addition to this, I will use one additional corpus which represents more recent English texts, the Lancaster-Oslo/Bergen

Corpus. With the help of these corpora, I will be able to study whether there have been any changes in the use of the modal auxiliary *must* from the historical times to the present day.

The Corpus of Late Modern English Texts (the CLMET) is the primary source of data for this paper. The CLMET consists of texts from the Project Gutenberg and the Oxford Text Archive¹, and the data base is divided into three parts (de Smet 2005, 70). The three sub-periods each consist of 70 years and they are divided as follows: 1710-1780; 1780-1850; and 1850-1920. De Smet (2005, 70-72) points out that the CLMET is a collection of different types of texts, and the process of collecting data involves certain principles. First, the texts of an author are only included in one sub-section, and this aims “to decrease the homogeneity between the sub-periods” (de Smet 2005, 70). Second, all authors included in the CLMET are British and also native speakers of English. As for this particular study, this is not a restrictive factor since I will only concentrate on the British English texts and will not have a comparative study with some other regional variety, for example American English. Third, there is “a restricted amount of texts to the corpus” that can be gathered from each author, more specifically 200 000 words (2005, 71). This guarantees that the corpus includes approximately the same amount of material from all authors. Fourth, although the CLMET includes a considerable amount of linguistic variation in that both non-literary and literary texts are available, de Smet (2005, 72) states that it is evident that the texts of higher class male adults still dominate those of others.

As was already mentioned, the CLMET is divided into three sub-periods, which each contain a different amount of words. The searches for this thesis were done by using the MonoConc-Programme, which gave a specific amount of words for each sub-period. The total amount of words in the first period is 2 096 405. The second period consists of 3 739 657 words

¹ According to de Smet (2005, 69), the data concerning the Project Gutenberg and the Oxford Text Archive are easily accessible on the World Wide Web.

altogether. The last period includes 3 982 264 words. The number of words in the texts are rounded to the nearest hundred thousand in each part of the CLMET, so the figures are 2 100 000, 3 800 000, and 3 800 000 respectively. These rounded figures will be used when counting the frequencies for the tokens in chapter 4.

One additional corpus was also included in the thesis in order to add a historical perspective, namely the Lancaster-Oslo/Bergen Corpus (LOB). The LOB Corpus was compiled in 1961 (Leech 2003, 225). This corpus consists of one million British English words, and the words are taken from approximately 500 text samples from 15 different genres. In these categories are included texts from such genres as press, learned writing, popular lore, and general fiction. The different text categories are listed in the LOB manual, which is accessible in the Internet (<http://khnt.hit.uib.no/icame/manuals/lob/INDEX.HTM>).

When compared to the CLMET, it should be noted that LOB is clearly smaller in size. It is a so called fixed corpus which means that no more words are included in it anymore, whereas the CLMET can be extended if wanted. Despite this fact, LOB offers a good point of comparison for my thesis as I conduct a historical analysis.

Since the corpora chosen for this thesis do not consist of the same amount words, it would be impossible to compare them with one another. However, I will use a method called “normalization” (Biber et al. 1998, 263). For each corpus separately, I will take the tokens of *must* which I will then divide by the amount of words found in the text. After this, I will multiply the result by a particular basis which should be the same for each corpus. The basis for this study is 100 000 words. I will devote a separate section for discussing each corpus and the corpus findings on *must* later on. At that point, I will give more specific numbers concerning normalization.

Next I am going to move on discussing the English auxiliaries and then define the

basic concepts related to this study.

3. Setting the stage

English auxiliaries are distinguished both syntactically and semantically from other verbs, that is, lexical verbs (Huddleston and Pullum 2002, 51). Warner (1993, 1) defines auxiliaries as ‘helping’ verbs and adds that auxiliaries are often “used to form the tenses, moods, voices, etc. of other verbs”. Auxiliary verbs include the primary verbs (*be*, *have* and *do*) and the modal verbs (principally *can*, *may*, *will*, *shall*, *could*, *might*, *would*, *should*, and *must*) (Quirk et al. 1985, 120).

The modal verbs are rather unique in nature because they can only function as auxiliaries.

Therefore, they are generally referred to as modal auxiliaries. As Biber et al. (1999, 485) point out, various meanings can be expressed by using modal auxiliaries, such as ability (*can*, *may*), obligation (*must*, *should*) and volition (*will*). It is also important to notice that “although they [modal auxiliaries] can convey meanings that relate to time differences (e.g. *can* v. *could*), the differences among them relate primarily to modality rather than tense” (Biber et al. 1999, 73).

The concepts of mood and modality will be discussed next, after which I will examine more closely the basic properties of modal auxiliaries.

3.1 Defining mood and modality

The distinction between mood and modality has traditionally been nothing but straightforward, although these concepts are intertwined with each other rather closely. Huddleston and Pullum (2002, 172) compare the relationship between mood and modality to that between tense and time, or aspect and aspectuality by stating that “mood is a category of grammar, modality a category of meaning”. Lyons (1968, 306) suggests that there is a major tense-distinction in English and it has

traditionally had two dimensions, those of past and present. Moreover, it has considerable similarities with the grammatical system of mood. Mood as well as tense is often marked by using verb inflection or modifying it by auxiliaries, the words which refer to modality (Huddleston 1988, 79-80). Mood, then, refers to the grammaticalization of modality.

There are three basic moods in English, those of indicative, subjunctive and imperative moods suggested by Jespersen:

They express certain attitudes of mind of the speaker towards the contents of the sentence, though in some cases the choice of mood is determined not by the attitude of the actual speaker, but by the character of the clause itself and its relation to the main nexus on which it is dependent. Further, it is very important that we speak of 'mood' only if the attitude of mind is shown in the form of the verb: mood thus is a syntactic, not a notional category.

(1924, 313)

Although mood is often defined as being an 'unmarked' class of sentences (Lyons 1968, 307), Quirk et al. (1985, 155) call the subjunctive mood stylistically fairly 'marked' variant when compared to other moods. Below are examples of the indicative (Quirk et al. 1985, 156-157), subjunctive (1985, 156-157) and imperative (1985, 434) moods:

- (1) Our decision is that the school *remains* closed. (indicative)
- (2) Our decision is that the school *remain* closed. (subjunctive)
- (3) If I/he/she *was* leaving, you would have heard about it. (indicative)
- (4) If I/he/she *were* leaving, you would have heard about it. (subjunctive)
- (5) *Be* careful. (imperative)

It should be noted that the mood system is neither very commonly used nor considered as a typical element in Modern English, for due to historical changes the mood system has no longer a strong position in the English grammar. There is actually only one residual mood distinction among the verbs and that is between the 1st and 3rd person singular *were* as contrast to *was* (Huddleston and Pullum 2002, 172). How these two forms are used can be seen in examples (3) and (4) above.

Mood is best applied to other languages than English, for example, French or German, because these languages are based on an inflectional system (Huddleston and Pullum 2002, 172). However, English is marked analytically by means of modal verbs (Palmer 1986, 1). Although the modal verbs can be distinguished from one another quite clearly, the system of modality involves its own complex terminology of such notions as possibility and necessity. As Palmer (1986, 21) suggests, mood and modality should be considered as two separate systems with their own functions, which are still closely related to each other.

An ample body of literature has been written on modality and several attempts have been made in order to define the concept (cf. Palmer 1979, 1; Hermerén 1978, 9-10), but characterisations vary and some of them remain rather vague. What has been common to the different researchers is that they often divide modality into certain number of components according to notions of necessity, possibility, permission etc. As Perkins (1983, 10) notes, the difference in number is “to some extent a matter of different ways of slicing the same cake”. Leech (1969, 203-204) provides the following criteria for distinguishing the various meanings:

- (6) Permission: You *may* smoke here. / You *can* smoke here.
- (7) Possibility: Electricity *can* kill.
- (8) Capability, ability: He *can* speak six languages.
- (9) Obligation: You *must* be back by ten. / You *have to* be back by ten.
- (10) (Logical) necessity: There *must* be some mistake. / Even the best of us *has to* die.
- (11) Volition: He *will* do anything for money.

The auxiliaries listed above are clearly related to one another semantically, some more than the other. There are also other linguistic ways to express modality, such as adjectives or adverbs (Huddleston and Pullum 2002, 173). The role of adverbs and how they relate to modality will be taken up again later on. As regards Leech’s categorisation, it needs to be added that it is rather specific. Due to the limited size of the present study, only some aspects of the criteria will be

taken into account. These are obligation and logical necessity.

In Huddleston and Pullum's (2002, 173) view, modality is "centrally concerned with the speaker's attitude towards the factuality or actualisation of the situation expressed by the rest of the clause." An unmodalised and modalised clause express a different factuality of the proposition, as in *He wrote it himself.* → unmodalised, and *He must have written it himself.* → modalised (ibid.). What also needs to be considered is what the relationship between the proposition and modality is. Lyons (1977, 452) talks about "the proposition that the sentence expresses". This means that it is possible for the reader to infer something from the sentence although it is not certainly known. If we analyze the sentence *He must have written it himself*, we as readers know of his probably having performed the act of writing, not because it is stated directly but because of our sense of inference. In addition, defining modality usually closely involves the concepts of possibility and necessity, which will be discussed briefly next.

The third aspect of modality involves the basic notions of necessity and possibility. If we go back to the two examples given above, they both infer a necessarily true proposition (Huddleston and Pullum 2002, 173). Lyons (1977, 787) also points out that one can refer to a possible world or imply that a proposition is possibly true, that is, it *may* be true. The different kinds of possibilities and necessities form "the core of the modality system" (Palmer 1979, 8), and they are based on von Wright's modal logic². These two notions are central also in the coming discussions because as it will be seen, the clauses in which the modal auxiliaries occur are often paraphrased in terms of necessity or possibility.

² Georg Henrik von Wright's work on modal logic (first introduced in 1951) is concerned to distinguish between four modes, which describe kinds of modalities that they exhibit (see also von Wright 1999, 26-38).

3.2 Distinctive syntactic properties of *must* and other modal auxiliaries

The English auxiliaries are defined by what are called the distinctive syntactic properties. These are referred to as the NICE properties, and the acronym stands for *Negation, Inversion, Code, and Emphasis* (Huddleston and Pullum 2002, 92). As Palmer (1987, 14) points out, the NICE properties are a tool which can be used to draw a distinction between the auxiliaries and the catenatives³. Furthermore, although auxiliaries have different functions in the verb phrase, that is, the primary verbs and the modal verbs make their own contributions in the clause, they can all function as an operator (Warner 1993, 3).

The negation-test defines simply whether an auxiliary “occurs with the negative particle *not*, or more strictly, whether it has a negative form” (Palmer 1987, 16). There are examples of negation below as well as some positive sentences (Palmer, 1987 16-17):

- (12) I *don't* want to ask you.
- (13) He *mustn't* ask them.
- (14) We *must* go.
- (15) I *like* it.

As can be seen from the examples above, there is a clear difference between auxiliaries and lexical verbs in that an auxiliary “has paired positive and negative forms” (Palmer 1987, 16), whereas lexical verbs require the form *do* in the negative form. In addition, the catenatives such as *want* in example (12) sometimes seem like an auxiliary but still require an additional *do*-form in the negative clause with it.

Inversion, on the other hand, refers to the inversion of the subject. If the inversion is possible, the constituents will appear in a specific order in a clause, the order typically being the auxiliary, then the subject and finally the full verb. Inversion occurs most often in the

³ The term ‘catenative’ refers to verbs such as *want, seem, and keep* after which there can occur (any) number of verbs in chain-like constructions. The catenatives are a distinct group from the modal auxiliaries (Palmer 1987, 172-3; Huddleston and Pullum 2002, 1225), and they can be called lexical verbs.

interrogative clause, although it is not at all restricted to that (Palmer 1987, 18). In addition, it should be noted again that with lexical verbs additional forms of *do* are required or the sentence will be ungrammatical, as in example (18). Consider the following (Palmer 1987, 18-19):

- | | | | |
|------|--------------------|--------------------|-----------------------------|
| (16) | I <i>can</i> come. | <i>Can</i> I come? | |
| (17) | We <i>must</i> go. | <i>Must</i> we go? | |
| (18) | I <i>like</i> it. | * Like I it? | <i>Do</i> I <i>like</i> it? |

The next property is what is called code (Huddleston and Pullum 2002, 93). Palmer's (1987, 19) term 'avoidance of repetition' is quite apt since it describes succinctly the essence of this property. Here the repetition of a verb (or a pronoun) is avoided and only auxiliaries can be used as an only verb to carry the meaning. This test once again distinguishes auxiliaries from lexical verbs which require the *do*-support (Palmer 1987, 19):

- (19) I *can* come and so *can* John.
- (20) We *must* go and so *must* you.
- (21) I *like* it and so *do* they.

The fourth property, that is, emphatic affirmation means that the speaker emphasizes the auxiliary by using a heavy stress (Palmer 1987, 20). This final feature is a matter of conversational aspect, not something that can be noted when reading the text. However, this feature is not something that only auxiliaries can possess. Illustrations of verbs with emphasis can be seen below (ibid.):

- (22) You *múst* see him.
- (23) I *cán* do it.
- (24) We *wíll* come.
- (25) He *hás* finished it.

According to Palmer (1987, 21), it is not infrequent that auxiliaries are often "used for emphatic affirmation of a doubtful statement, or the denial of the negative". This is then a crucial aspect which differentiates auxiliaries from other verbs. Palmer's view is also congruent with Quirk et al. (1985, 124) who call this feature by the name emphatic positive because its function is "to

deny a negative which has been stated or implied”:

- | | |
|------------------------------|-----------------------------------|
| (26) I <i>can</i> come. | (You are wrong to think I cannot) |
| (27) You <i>must</i> come. | (You do not want to) |
| (28) We <i>did</i> see them. | (You thought we did not) |

Finally, it should be mentioned that the NICE properties are characteristic of both modal auxiliaries as well as to some degree of the primary verbs *be*, *have* and *do*. There are, however, certain properties which can be used in order to make a distinction between these two abovementioned groups. According to Palmer (1979, 9), the modal auxiliaries do not have an –s form for 3rd person singular (**cans*, **musts*) and they lack non-finite forms (**to can*, **musting*). Moreover, they cannot occur together in a clause, as in **He may must come*. Although Huddleston (1976, 334) suggests that the NICE properties are quite idiosyncratic to English, Palmer (1979, 180) raises an important point by stating that “languages are idiosyncratic in the way in which they mark their grammatical categories”. What should be concluded here is that the NICE properties have significance especially for native speakers since they recognise that modals belong to a special verb class and that they have a lot in common also semantically.

3.3 Restricting the study to *must*

Auxiliaries consist of a colourful group of verbs which have different functions in the verb phrase. However, there are many semantical or syntactical features that are characteristic of only some modal auxiliaries, which make it difficult to draw any broad generalisations concerning their behaviour. One might think, therefore, that it is impossible to choose any one modal auxiliary as a representative of modal auxiliary class.

At the same time, there are some distinctive syntactic properties that are shared by all auxiliary verbs, such as the NICE properties. Moreover, the modal auxiliaries are closely

connected also semantically, for it is not unusual that they are used as overlapping with one another. There have even been studies concerning the core meanings of a single English modal (cf. Perkins 1982, 245-273). Based on this, it is argued that the meaning of one modal auxiliary can be described in isolation. It is evident, however, that the modal auxiliaries have influence on each other's behaviour since they form such a tight net of interrelations.

As for the modal auxiliary *must*, I chose this particular modal because there are many fascinating aspects connected to it: on the one hand, it has very distinct characteristics which make it "a very clear member of the modal auxiliary class" (Huddleston and Pullum 2002, 108). On the other hand, there are many complex issues involved in the interpretation of the meanings of *must*, since it is closely associated with such expressions as obligation, necessity and possibility. Moreover, *must* is a rather frequently used modal auxiliary although due to grammatical change, it is frequently been replaced by *have to*⁴ (Leech 2003, 229). The modal auxiliary *must* is very straightforward and clear when compared to some other modals, and semantically it is almost always interpreted as denoting necessity or possibility, although its ambiguous nature makes it even more fascinating to study (Huddleston and Pullum 2002, 178):

- (29) He *must* have been delayed. (possibility)
- (30) You *must* pull your socks up. (necessity)
- (31) You *must* be very tactful. (ambiguous)

As a conclusion, it can be stated that *must* is an excellent representative from the class of the modal auxiliaries, for it has enough syntactical and semantical qualities in common with other members but yet it has a unique nature of its own. However, one should always restrain oneself from making too precipitate generalizations based on one modal auxiliary only.

⁴ According to Huddleston and Pullum (2002, 112), *have got to* is an informal alternative to *have to*. Moreover, it is rather restricted to informal British English. It has also no past participle form. Due to these features, the auxiliary *have to* will be used in this thesis.

3.4 The semantics

Besides syntax, the semantic analysis of auxiliaries has traditionally been a difficult matter, since it has been a challenge to distinguish between various meanings for a given modal auxiliary. Furthermore, there are two different approaches of how the modals should be categorised into groups according to their meaning. The monosemy approach favours an individual meaning for each modal (Coates 1983, 9), and this approach comes relatively close to Perkins' studies concerning the core meanings of the English modals (1982, 245-273). In short, Perkins aimed at isolating a single basic meaning for every modal independently of a specific context. Coates (1983, 9) suggest that the other approach, that is, polysemantic one deals with a continuum of different types of meanings. In other words, a modal auxiliary has more than one meaning, but since auxiliaries have influence on one another, their meanings may overlap. I agree with Coates (1983, 10) who claims that there exists a problem of indeterminacy in natural language. By this it is meant that there are no discrete categories but different approaches are in synthesis together. Having said this, it is crucial here not only to aim at adopting one approach and reject the other as useless, but to recognise the relevant and feasible features of each one.

I will next discuss different kinds of modalities and define those which are relevant for this study. Secondly, I will discuss root and epistemic meanings which are the basic meanings usually distinguished for the modal auxiliary *must*. In addition to this, I will also introduce the sub-senses which are characteristic of the root meanings of *must*. Finally, I will introduce the concepts of subjectivity and objectivity and explain how they are related to the modal *must*.

3.4.1 Kinds of modality

Modal utterances are often distinguished between epistemic and root modality. According to Sweetser (1990, 49-50), “there is strong historical, sociolinguistic, and psycholinguistic evidence” that the root meanings create the foundation for modal expressions and the epistemic meanings are then rooted in this foundation. Although these two kinds of modalities are semantically close with one another in many ways, they still have very clear and distinct characteristics as well.

The word ‘epistemic’ comes from the Greek for “knowledge” (Huddleston and Pullum 2002, 178), and epistemic modality is concerned with the degree to which the speaker assumes the proposition to be true or false (Warner 1993, 14). In other words, the speaker may infer the proposition to be probably true, necessarily true, unreality etc. as in the following examples (Declerck 1992, 351):

- (32) He *may* be at home now.
- (33) He *must* be at home now.

As Palmer (1979, 41) points out, epistemic modality is often fairly distinct from other types of modalities because epistemic modals mainly express speaker judgment. Therefore, epistemic modality can be paraphrased as ‘*I confidently infer that...*’ or ‘*In the light of what is known, it is necessarily the case that...*’ (Coates 1983, 41).

The term ‘root’ is often used for nonepistemic modals and it involves such expressions as obligation, permission and ability (Declerck 1992, 351-352). Here the speaker’s role is fairly different from that of epistemic modality. Consider the examples below (Declerck 1992, 352):

- (34) You *must* leave now.
- (35) This problem *can* be solved quite easily.

Typical root modals, such as *must* and *may*, cover a range of meanings, and the expressions of obligation and permission are only some examples. Due to the variation in the meanings, it is not simple to paraphrase the examples associated with root *must*. However, Coates (1983, 32) suggests that the phrase ‘*It is necessary for...*’ can be used generally for all the clauses expressing root *must*.

Because of the strong sense of obligation, root modality is sometimes called deontic modality (cf. Huddleston and Pullum 2002, 178; Palmer 1979, 58). Sweetser (1990, 152) claims that the term ‘deontic’ is fairly restricted in its meaning, for it is mainly concerned with social or moral obligation. Root modality covers more meanings in the sociophysical domain of modality. Furthermore, root modality is recognized as being somewhat ‘fuzzy’ (Coates 1983, 32). This means that the modality covers both strong and weak obligation and compulsion (more detailed description in section 3.4.2.1). Therefore, it might be said that deontic modality is a sub-category of the main class root modality. For this reason I will use root modality as separate from epistemic one.

There is also a third category which is sometimes distinguished from epistemic and root modality. This is called dynamic modality, and it is concerned with people’s abilities and disposition (Huddleston and Pullum 2002, 178). As Warner (1993, 15) points out quite aptly, it might be difficult to make a distinction between dynamic modality and other root modalities, especially those which denote permission and obligation. Moreover, as far as the modal auxiliary *must* is concerned, dynamic modality is fairly rarely found. Example (36) illustrates quite well the core of dynamic modality: it is the case of a person’s internal need (Huddleston and Pullum 2002, 185):

(36) Ed’s a guy who *must* always be poking his nose into other people’s business.

As far as the present study is concerned, it can be stated that dynamic modality “is less central to

modality” than the two other kinds (Huddleston and Pullum 2002, 179). Therefore, I will not discuss it separately as I analyze the corpus data. As Coates (1983, 21) argues, root modality forms essentially one semantic field where dynamic modality is not a distinct part as such. However, several linguists associate the dynamic aspect with epistemic modality and more specifically, with progressive form (cf. Declerck 1992, 409; Quirk et al. 1985, 224). It is for these reasons that I will examine the meanings of *must* from the point of view of root and epistemic modality in this thesis. I will, however, take the dynamic aspect into account when analyzing the corpus data in chapter 4.

3.4.2 Relating root and epistemic modality

I have previously argued that the modals should be considered as interrelated rather than totally isolated from one another. In Sweetser’s opinion (1990, 50) the modals have meanings which “show an extension of the basic root-sense to the epistemic domain”. So far in this study, the discussion has mainly concerned all the modal auxiliaries in general. In this section, however, I will present a more detailed analysis of the modal auxiliary *must* and discuss its different senses illustrated in various grammars and research literature.

There are two main meanings which can be distinguished for the modal auxiliary *must*: one denoting root meaning, that is, obligation and compulsion, and the other denoting epistemic meaning, or logical necessity (Quirk et al. 1985, 224-225). In Sweetser’s opinion (1990, 52) root modals can be described as fairly force-dynamic, which means that they express a varying degree of compulsion which is directed towards someone. Since root modality is usually recognized as a more basic one, it will be discussed first.

3.4.2.1 Root meanings of *must*

As was noted already earlier, the notion of ‘fuzziness’ can be related to the root meanings of *must* (Coates 1983, 32). This means that the senses of *must* can vary between strong and weak obligation and compulsion, and there might even be quite a variation in the scale. In other words, there are a particular range of sub-meanings which all denote the root meanings of *must*. The compulsion expressed by *must* is illustrated in table 1: sense 1 denotes a strong degree of compulsion and as one goes further down on the table, the degree of compulsion will get considerably weaker (based on Declerck 1992, 381-382):

Sense and a degree of compulsion expressed by <i>must</i>	Example
1. Something is necessary in the speaker's opinion.	<p>a. We <i>must</i> have these figures checked before we draw any conclusions.</p> <p>b. You really <i>must</i> pull yourself together.</p>
2. Express emphatic advice (in its weaker form, <i>should / ought to</i> is used).	<p>a. You <i>must</i> see the exhibition if you go to town.</p> <p>b. If you worry about the future, you <i>must</i> take out a life insurance.</p>
3. In instructions or orders.	<p>a. Dogs <i>must</i> be kept on a lead in the gardens.</p> <p>b. You <i>must</i> give me your answer now.</p>
4. A sense of inner compulsion, often heavily accented. In <u>if</u> -clauses in the second-person, often sarcastic (interchangeable with <i>will</i>).	<p>a. I <i>must</i> find her and say I'm sorry. I can't risk losing her.</p> <p>b. You'd better let out that dress <u>if</u> you <i>must</i> wear it.</p>
5. Express a kind offer or invitation, often weakly accented.	<p>a. You <i>must</i> send us a letter soon.</p> <p>b. You <i>must</i> have some more tea. It will do you good.</p>
6. <i>Must</i> is used before a verb of saying (<u>ask</u> , <u>admit</u> , <u>confess</u> etc.) or before a cognition verb (<u>realize</u> , <u>remember</u> , <u>understand</u> etc.).	<p>a. I <i>must</i> <u>confess</u> that I was taken by surprise.</p> <p>b. You <i>must</i> <u>understand</u> that this is going to upset her a lot.</p>

Table 1. The senses and a degree of compulsion expressed by *must*

The root meaning of *must* is always used when referring to the state of utterance, as can be seen in the examples illustrated in table 1. According to Coates (1983, 40), *must* does not have some forms, such as nonfinite and past tense forms. It is possible, however, to find *must* in clauses which refer to the past if it occurs in reported speech (Declerck 1992, 384):

(37) He said we *must* obey him.

As for the past tense, if there is a perfect infinitive after *must*, it is almost always a question of epistemic meaning. As always, there is an exception to the rule: if root *must* is followed by a perfect infinitive, it expresses anteriority and therefore, *must* is acceptable (Declerck 1992, 384). This contrast between the perfect infinitive in epistemic and root senses is illustrated by examples (38) and (39) below (ibid.):

- (38) There's a dog in the garden. Someone *must have let* it in. (epistemic; inference)
 (39) Foreign football players *must have played* in Belgium for at least five years before they can get the Belgian nationality. (root; anteriority)

However, the occurrence of the perfect infinitive as expressing root meaning is very rare and instead, the missing forms of *must* have often been replaced by the different forms of the verb *have to*, as in the following (Declerck 1992, 383-384):

- (40) He *has to* report to the probation officer once a week. (habitual)
 (41) We *have to* be at the airport at 11.30. (future)
 (42) I've *had to* move to another flat. (perfect form)

Root *must* is usually used assertively. If *must* is used in a negative sentence, it is always the main predicate or the event which is negated, not the modality (Coates 1983, 46). In other words, *must not* (*mustn't*) expresses a prohibition or lays an obligation not to act (Declerck 1992, 384):

(43) He *mustn't* tell anybody.

As Coates (1983, 39) notes, there is a rather close relationship between *must* and the modals *may* and *can* as far as negation is concerned. Although these modals are not synonymous with one another, the close semantic relationship between giving permission and laying obligation can sometimes be considered as overlapping. In addition, *must* is nowadays often been replaced with *need* or *have to* in the negative clauses. I will not, however, discuss the relationship between *must* and these auxiliaries in detail but concentrate on the meanings of *must* only.

A few words should be said of interrogation and *must*. The root meanings of *must* occur also in the interrogative clauses. There is a tendency to use *must* only in the type of questions “in which it has already been suggested or implied that there is a necessity” (Palmer 1979, 96). This is illustrated in example (44). Furthermore, root *must* can be used sarcastically in utterances with a 2nd person subject (Quirk et al. 1985, 225). The sarcastic use of root *must* is exemplified by (45):

- (44) *Must* I go? (Palmer 1979, 96)
 (45) Why *must* you always be finding fault with that girl? (Quirk et al. 1985, 225)

Finally, there is one additional point that concerns the root meanings of *must*. According to Poutsma (1916, 40), *must* is sometimes used with the word *needs*, which can be categorized as an adverb since it is used as emphasizing other words. As Quirk et al. (1985, 589) note, *needs* is rare and belongs to a literary style. Moreover, it can occur either before or after *must* in an assertive or interrogative clause (Quirk et al. 1985, 589):

- (46) That *must needs* be their intention. (‘must inevitably’)

It seems that root *must* can be used in fairly many situations due to its variety of meanings.

However, there are some situations in which root *must* is not appropriate and therefore, epistemic meanings are used instead.

3.4.2.2 Epistemic meanings of *must*

The epistemic meaning of *must* has to do with speaker judgment. It differs from the root meanings in that the speaker makes inferences of the possible truth of the proposition on the basis of the expressed clause (Coates 1983, 41). Epistemic meanings are not so commonly used in speech as root meanings, which is probably one reason for the lack of research done on the topic (1983, 42). However, since epistemic *must* is relevant for the present study, the meanings are

examined here and later on, they will be discussed again in connection with the corpus data.

Consider the examples which all express epistemic *must* (Declerck 1992, 406-407):

- (47) He *must* be stuck in a traffic jam.
- (48) You *must* be Mr Pascoe's daughter.
- (49) Your brother *must* be at least sixty.

In example (47), the speaker is judging that the proposition expressed is the only one possible, whereas in (48) the speaker is making an assumption of something which is based on logic.

According to Declerck (1992, 407), *must* is also used in making estimations or guesses. This is exemplified in (49). Coates (1983, 41) summarizes the two most crucial elements that epistemic *must* expresses: the first is "logical inference", and the second, the degree to which the speaker thinks that the proposition is true. The epistemic meaning can sometimes be paraphrased as '*It is necessarily the case that...*', since it is a question of logical necessity (Quirk et al. 1985, 225).

Epistemic *must* is usually used in such contexts which are expressing a present or past situation (Huddleston and Pullum 2002, 178). Furthermore, stative verbs such as *be* occur often with epistemic *must*. As Coates (1983, 44) points out, there are no past tense forms for *must*, but despite this, the proposition can refer to the past. This is done by using *must + have + a past participle* construction. Poutsma (1916, 40) calls this construction a hypothetical inevitableness because it refers to a state which has not taken place yet. The following examples illustrate the present and past states with epistemic *must* (Woisetschlaeger 1985, 115):

- (50) That *must* be Harry at the door. (present)
- (51) It *must* have been Harry at the door. (past)

Epistemic *must* expresses only rarely the states in the future and in these cases, it is often interpreted as denoting obligation or compulsion (Palmer 1979, 44). The surrounding context, however, is a crucial factor when interpreting the clause (ibid.):

(52) Something *must* happen next week.

Unlike root *must*, epistemic *must* can only rarely occur in interrogative or negative constructions.

The forms of *need* and *have to* are often preferred instead. Quirk et al. (1985, 225), however,

suggest that there are some situations in which epistemic *must* is in place:

(53) His absence *must not* have been noticed.

(54) *Must* there be some good reason for the delay?

In example (53), epistemic *must* occurs with negation and the sentence could be interpreted as

'His absence *can't* have been noticed.' (Quirk et al. 1985, 225). The synonymous use of *mustn't*

and *can't* is fairly acceptable in American English (Declerck 1992, 407). Example (54) illustrates

a rare occurrence of epistemic *must* in questions. Here, the speaker is expecting to have a positive answer.

Coates (1983, 41) makes a good point in saying that in clauses with epistemic *must*, "the speaker's confidence is [often] overtly expressed". In other words, the speaker's statement is introduced with different hedges such as *I think*, *I mean*, *I'm sure* etc. With the help of hedges, it is easier to reinforce the truth of the proposition expressed by the speaker. Coates (ibid.)

illustrates this by the following example:

(55) *I think* it *must* be very nice.

The adverbs can express a varying degree of necessity (Poutsma 1916, 40), in which case they are connected with root *must*. If the adverbs express the speaker's confidence, for example, as with the adverbs *surely* and *certainly*, they are related to epistemic *must*.

I will shortly discuss my corpus findings and at that point, it will be interesting to find out whether the typical features discussed above are illustrated in the data. Moreover, since the meanings of root *must* are fairly fuzzy and often difficult to distinguish from one another, I will concentrate on two senses only: these are sense 1 ('something is necessary in the speaker's

opinion’) which expresses the strongest degree of compulsion, and sense 6 (‘*must* before a verb of saying or a cognition verb’) which expresses the weakest degree of compulsion. Hence, by examining the different features as well as the frequencies of these two senses in different corpora I am going to detect whether the use of *must* has changed during the past three centuries.

Next I will examine the concepts of subjectivity and objectivity and how they are related to the modal auxiliary *must*.

3.4.3 Subjective and objective uses

In the preceding paragraphs I have made a distinction between root and epistemic modality and discussed how the modal auxiliary *must* relates to these concepts. Besides the differences that have been pointed out so far, there is at least one more element that complicates the interpretation of *must* when uttering clauses, that of the speaker’s role. Huddleston and Pullum (2002, 181) distinguish subjective and objective uses separately for both root and epistemic modalities.

Compare examples (56) and (57) below (2002, 181):

- (56) You *must* clean up this mess at once. (subjective)
 (57) We *must* make an appointment if we want to see the Dean. (objective)

The common nominator for these clauses is that they both illustrate the root meanings of *must*. The difference is that in (56), the speaker is clearly imposing an authority over someone else. As for the objective necessity, Huddleston and Pullum (2002, 183) claim that *must* is often been replaced, for example, with *have got* or *need*. Hence, example (57) would look like this after the replacement: ‘We *have got / need* to make an appointment...’. Moreover, objectivity is often related to rules and regulations and therefore, the speaker’s role is not as prominent as in the subjective clause.

An epistemic sense of *must* also involves subjective and objective uses. There is

clearly a difference in strength (Huddleston and Pullum 2002, 181):

- (58) What happened to Ed? – He *must* have overslept. (subjective)
 (59) If I'm older than Ed and Ed is older than Jo, I *must* be older than Jo. (objective)

Subjective *must* illustrated in example (58) could be paraphrased as '*The only possible conclusion is that...*' (Palmer 1979, 44) and therefore, it can be described as pragmatic weakening, as is pointed out by Huddleston and Pullum (2002, 181). They also add that the modalised example with *must* is weaker than its unmodalised counterpart '*He has overslept*'. Example (59) indicates that the speaker is more confident of the proposition that he is making than in (58).

Although it is possible to make a distinction between subjective and objective modality as was exemplified above, it is not always easy to distinguish subjectivity in a clause. This is particularly difficult in the case of the English modal verbs (Palmer 1986, 16). According to Coates (1983, 33), there is an ambiguity between the concepts of subjectivity and objectivity as far as the root meanings of *must* are concerned. This is a consequence of a colorful terminology used in the literature, that is, some linguists have defined the terms rather vaguely. In Palmer's opinion (1979, 91) *must* is discourse oriented which means that the speaker's involvement is central. Yet, the concept of subjectivity seems rather problematic to define and Palmer also admits this point. Thus, Coates (1983, 33) hits upon the right thing by saying that "there is no clear dividing line between cases involving subjectivity and those which do not". As for the epistemic *must*, subjective examples are more frequently found than objective ones since the statement express the speaker's confidence in the truth (Coates 1983, 46). Furthermore, root *must* is typically fuzzy and this is also the case when it comes to subjectivity. The clauses with objective *must* are easily interpreted as expressing root modality and therefore, the clauses might seem ambiguous.

Smith (2003, 243-244) points out in his article that *must* is often distinguished from *have to* in that the former is considered as subjective whereas the latter is almost always objective. This subjectivity can be connected with the nature of the meaning of root *must*, which is prototypically that of obligation and compulsion. Additionally, Smith (2003, 257) has also studied the meanings of *must* by using different corpora and the results showed that “it is difficult to determine the proportions of subjective and objective uses of *must*”. Instead, it was found out that the authoritarian-sounding root *must* has gradually been replaced by epistemic *must*.

Because of the complex nature of subjectivity related to *must*, I will not concentrate on this matter in analyzing the corpus data. Instead, I am mainly interested in examining if there has been a considerable decline in the senses of root *must* and consequently, a trend to use more of the epistemic meanings.

4. Corpus findings on *must*

This chapter will present an analysis of the modal auxiliary *must* which I conducted with the help of two different corpora, those of the CLMET and LOB. I will discuss the three parts of the CLMET as well as LOB separately. Moreover, I will mention the frequencies counted for each corpus at the beginning of each section. Finally, I will relate the findings to the theoretical part discussed previously.

As for the CLMET, my aim was to analyze 10% of the tokens produced by the search string “must”, which means that every 10th example was counted. As far as LOB was concerned, I included 25% of the tokens to this study, that is, every fourth example. The reason for doing this is that the random sample is representative, that is, it represents fairly well the whole corpus data. When discussing each corpus, I will use a number of examples such as the following:

- (1) Words were given us to communicate our ideas by: and there [[must]] be something inconceivably absurd in uttering them in such a manner that [--] (leuven\1710-1780\chesterfield – letters to his son on the art....txt, Line 3097)

After the example, there is first a reference to the corpus used as well as the years it covers. Then the author as well as the specific text is referred to. In addition, a reference to the line where the quotation begins is marked in the end. As regards LOB, the markings differ a little from those in the CLMET. The line number is given secondly, and finally a reference to the specific text category is added to the end.

4.1 The CLMET 1 (1710-1780)

The first part of the CLMET corpus represents the texts published in the 18th century and their authors. The search string “must” produced 3 588 tokens altogether, of which I analyzed 359 examples. 270 tokens were related to the root meanings of *must*, that is, 129 occurrences per 100 000 words, whereas 89 tokens were related to the epistemic meanings, that is, 42 occurrences per 100 000 words. Consequently, the frequency for the overall figure of “must” is 171 occurrences per 100 000 words.

As Sweetser (1990, 50) mentions, epistemic modality has developed from root modality during historical times. In fact, root modality had originally the meaning ‘be strong, be able’, from which the development continued to the various modal verbs. Gradually epistemic modality developed as well, and it was considered as an extension from root modality. Root *must* represents one of those modals which are associated with a strong obligation and force dynamics because of this historical background. As regards the CLMET 1 which covers the years 1710-1780, I am mainly interested in examining whether root *must* has actually been a clearly dominating sense when compared to epistemic *must* since the historical background gives reasons

to expect so. Moreover, it will be interesting to see if some typical characteristics of root and epistemic *must* are to be found in the data.

4.1.1 Findings on root *must*

As the discussion in section 3.4.2.1 suggested, root meanings of *must* are fairly fuzzy which means that the modal can express a strong or weak obligation or compulsion. Because of this wide range of meanings, difficulties might arise when interpreting the degree of compulsion. This was certainly the case with root *must* in my data where clear examples which could have matched all the senses illustrated in table 1 were nearly impossible to find. This is illustrated by the following example: it can express either sense 1, in which case the speaker thinks it is necessary for the hearer to act as is told, or it can equally express sense 3, in which case it functions more of an instruction to the hearer:

- (2) You will be of the House of Commons as soon as you are of age; and you [[must]] first make a figure there, if you would make a figure, or a fortune, in your [--] (leuven\1710-1780\chesterfield – letters to his son on the art....txt, Line 9464)

Furthermore, there were quite a few examples in the data which were in the passive. The examples were usually stating an instruction or order of some type:

- (3) [--] Christian churches; nor can even our own refuse to admit the conclusions which [[must]] *be drawn* from the viiiith and the xviiiith of her articles. (leuven\1710-1780\gibbon – decline and fall of the roman empire 1.txt, Line 19661)

According to Coates (1983, 36), such clauses usually express a weaker sense of obligation since the speaker's role is not emphasized. For this reason I am of the opinion that these types of examples should be included under sense 3, which expresses instructions of various kinds.

Due to this fuzziness, I chose to concentrate mainly on two senses, which illustrate the extreme

ends of the scale in table 1, that is, senses 1 and 6. As regards the senses in between, I included them under one common heading, that of ‘other senses’. I have gathered the tokens of the different senses in table 2 below. Moreover, I have counted the proportions⁵ by dividing the tokens with the number of examples with root *must*, which in the case of the CLMET was 270.

Root MUST	Tokens	Proportion
Sense 1 (‘something is necessary’)	164	60.7 %
Sense 6 (‘verbs of saying, a cognition verb’)	53	19.6 %
Other senses	50	18.5 %

Table 2. Tokens and proportions of the senses in the CLMET 1

There were a number of examples in the data which illustrated the first sense, that is, that something is necessary in the speaker’s opinion:

- (4) [--] on ourselves as rivals to our Colonies, and persuaded that of course we [[must]] gain all that they shall lose. Much mischief we may certainly do. (leuven\1710-1780\burke – on conciliation with america.txt, Line 781)

As regards the subjects’ role in the examples denoting sense 1, it is often the case that the first person subject is associated with an obligation or necessity and the second person subject with a command or an insistent request (the Oxford English Dictionary, that is, the *OED*). Moreover, the third person subject is often associated with restricted “expressions of a necessity [--] or enunciated as a general proposition” (the *OED*). Example (4) above illustrates a necessity which

⁵ The total of all the proportions may not equal as 100 % because I have rounded the figures to the nearest decimal.

is related to the first person subject. The second person and third person subjects as well as how they relate to *must* can be seen below:

- (5) [--] and you think that you want it still more than you do. *You* [[must]] go through your noviciate before you can profess good-breeding; (leuven\1710-1780\chesterfield – letters to his son on the art...txt, Line 10519)
- (6) [--] and intrepidity, with exterior modesty and seeming diffidence. *He* [[must]] modestly, but resolutely, assert his own rights and privileges. (leuven\1710-1780\chesterfield – letters to his son on the art...txt, Line 11948)

Besides examples illustrating sense 1, it was interesting to note that the data had quite a few examples in which *must* was paired with verbs of saying or knowing. The most usual verbs that occurred were *tell* and *know* (8 occurrences each), *own* (5 occurrences), as well as *acknowledge* and *consider* (3 occurrences each). I find this very fascinating because root meanings are usually connected with a strong obligation and compulsion, whereas sense 6 is placed in the lowest end of the scale (cf. table 1) and therefore, it denotes the very weakest degree of obligation. The following examples illustrate this:

- (7) [--] is the most disagreeable office of friendship, but it is a necessary one. I [[must]] *tell* you, therefore, what past this morning between the colonel and Mr[--] (leuven\1710-1780\fielding – Amelia.txt, Line 9165)
- (8) [--] God rest! I shall speak to the latter article of your demands first. You [[must]] *know*, your Lord knows, that I enjoy the principality of Otranto from my father[--] (leuven\1710-1780\walpole – the castle of otranto.txt, Line 2302)

When comparing senses 1 and 6, it is evident that *must* in the former case is fairly forcible since it usually has a compelling force which directs the hearer to act. In the latter case, *must* is often emphasizing the point that the speaker is making, as in expressions ‘*I must say*’ which can be interpreted as ‘*I cannot help saying*’ (the *OED*). As far as all the verbs included in sense 6 are considered, they all are – one way or the other – connected with some type of a cognitive process which then relates to saying and thinking.

One more interesting point needs to be made as regards sense 6. First, consider the

two examples which both have the same verb *own* (in the sense of ‘admit’) in them:

- (9) “It is a good girl”, replied he, chucking her under the chin; “I [[must]] *own* you have always submitted to my knowledge of these matters. (leuven\1710-1780\fielding – tom jones.txt, Line 7690)
- (10) [--] him for a son-in-law, in some measure blinded us to all his imperfections. *It* [[must]] *be owned* that my wife laid a thousand schemes to entrap him [--] (leuven\1710-1780\goldsmith – the vicar of wakefield.txt, Line 2788)

As can be seen from the examples above, if the verb of saying (or a cognition verb) is used in an active clause it most often denotes sense 6, as in example (9). The same verb can also be used in the passive clauses, as in (10). However, the meaning does not essentially change since the expressions draws “the reader’s or listener’s attention to what you are about to say” (Collins Cobuild English Dictionary). Therefore, these types of examples having the construction *It must be + a verb of saying or a cognition verb* need to be distinguished from other passive clauses, which fall under the category ‘other senses’ because there is a difference in meaning. To be more precise, the other passive constructions often express some type of an instruction or an order and hence, sense 3.

As I have argued previously, root *must* is mainly used in an assertive manner.

However, it can occur with negative forms in which case the sentence will mean ‘*I order (you) not to*’ or ‘*It is necessary for (you) not to*’ (Coates 1983, 39). The following examples illustrate how the obligation is affected by negation:

- (11) [--] in proportion as you reap, which you do daily, the fruits of his labours. I [[must]] *not*, however, conceal from you that there was one article on which you own [--] (leuven\1710-1780\chesterfield – letters to his son on the art....txt, Line 3657)
- (12) [--] for the channel, and insult us in our own ports; to effect this, sir, they [[must]] *not* only conquer us, but conquer us without resistance. (leuven\1710-1780\johnson – parliamentary debates 1. txt, Line 11898)

It is significant that no cases involving the pattern epistemic *must + not* was found in the data.

Coates (1983, 238) explains this by saying that “the modal predication of the epistemic modals is never altered”. Moreover, the negation has its effect also on the clauses with verbs of saying or knowing:

- (13) Business must not be sauntered and trifled with; and you [[must]] *not say* to it, as Felix did to Paul, “At a more convenient season I will speak [--] (leuven\1710-1780\chesterfield – letters to his son on the art....txt, Line 17863)

Here it is not sense 6 anymore which defines the meaning of the clause, but the negation has become the dominating factor instead. As example (13) shows, the person addressed is being prohibited not to say anything, which is a clear connection to sense 1. Therefore, the meaning of the clause can change from one to another in quite a subtle way.

As for the interrogatives, it is always the main predicate which is questioned, as was the case with negation (Coates 1983, 242). The questions found in the data usually expect a positive answer, as in (14). There were also a couple of examples in which both negation and interrogation was found. As Palmer (1979, 28) points out, these examples are quite exceptional in that they “are not semantically negative” but expect a positive answer. This is illustrated in (15):

- (14) “I do most devoutly”, said Hippolita; “but will He not spare my only comfort? [[Must]] Matilda perish too? – ah! Father, I came – but dismiss thy son. (leuven\1710-1780\walpole – the castle of otranto.txt, Line 3492)
- (15) [--] said Matilda fervently; and you are virtuous, you are guiltless! –Oh! [[Must]] *not* I, must not I *complain*?” “You must not”, said Hippolita – “Come, all will [--] (leuven\1710-1780\walpole – the castle of otranto.txt, Line 3280)

If one considers the meanings of the examples just illustrated, the former is clearly expressing a necessity and hence, sense 1. If ignoring the negation, one could consider that example (15) and the verb *complain* could belong to sense 6 since it describes the act of speaking in broad terms. However, since there is the negative form *not* in the clause it changes the meaning so that the person is suddenly denied the act of complaining, as was the case in example (13).

Most examples in the CLMET 1 were those denoting the root meaning of *must* and

more specifically, those features discussed above. As was mentioned in the beginning, there were also 89 tokens which could be associated with epistemic meaning. I will next examine what types of features typical of epistemic *must* were found from the data.

4.1.2 Findings on epistemic *must*

Unlike root meanings of *must*, epistemic *must* is fairly simple and straightforward due to its “internal regularity and completeness” (Palmer 1979, 41). Since it can basically only refer to the present or past states or activities, epistemic *must* has rather limited uses. Epistemic *must* is distinguished from root *must* in that no such clear sense distinction can be made for epistemic meanings. Instead, there are different features which determine whether *must* can be interpreted epistemically or not. These typical features were discussed in section 3.4.2.2 and will be taken up here again.

When I studied the first part of the CLMET, I noticed that epistemic *must* is very commonly paired with a stative verb. Typical examples from the corpus are seen below:

- (16) It is prudent to yield when the contest, whatever may be the issue of it, [[*must*]] *be* fatal to both parties. A boy, only thirteen years of age, the grandson of [--] (leuven\1710-1780\gibbon – decline and fall of the roman empire 1.txt, Line 4131)
- (17) [--] of his friends who knew they had nothing to fear from his strictures; and he [[*must*]] *be* a wiser man than me who can tell what advantage or satisfaction he derives [--] (leuven\1710-1780\smollet – the expedition of humphrey clinker.txt, Line 2283)

Although the verb *be* was nearly always found with epistemic *must* in my data, there was also one example which expressed obligation and therefore, root *must*:

- (18) He then called for his bill with the utmost haste, declared he [[*must*]] *be* at Hereford that evening, lamented his great hurry of business, and wished [--] (leuven\1710-1780\fielding – tom jones.txt, Line 2518)

The construction *must* + *be* may be impossible to interpret if isolated from the textual context as

can be seen from examples (16)-(18) above. It is evident that the speaker's role as well as his attitude towards the situation is emphasized. If it is a question of root meaning, there is often an implication of some form of a human control which means that someone is exercising his authority. This is illustrated by (18), which is expressing sense 1 or a necessity. This differs from epistemic meaning, in which the speaker only assumes that something *must be* the case or it is necessarily so because of what is known before. However, although it seems to be easy to make clear distinctions between these two senses, it is rarely so simple in practise.

The tense distinction was not notable when analyzing the examples concerning root *must* since it almost always refers to the time of speaking. However, the tense distinction is in the nature of epistemic *must* although it does not refer to the past as such. As Palmer (1979, 50) suggests, the speaker can make inferences about the past because of the evidence that is available. This is illustrated by example (19):

- (19) The power of the Goths at that time [[must]] *have been* great: it was probably from them that the Sinus Codanus [--] (leuven\1710-1780\gibbon – decline and fall of the roman empire 1.txt, Line 7564)

There might arise some difficulties in interpreting the meanings of the clauses where the speaker makes judgments about the past because *have* may be ambiguous in the past reference. According to Coates (1983, 45), it can either refer purely to the past, as in (19), or then has a past reference which extends to the time of speaking, as in (20):

- (20) [--] thousand sesterces, which, according to the lowest computation of that age, [[must]] *have exceeded* three thousand pounds a year. He generously requested the [--] (leuven\1710-1780\gibbon – decline and fall of the roman empire 1.txt, Line 15430)

It is important to be aware of these two main types that can be made as regards the past.

However, I agree with Palmer (1979, 51) in that it is sufficient to refer to the past without separating different types. For the rest of the study, it will not be relevant to separate the different

types of the past references and therefore, I will analyze the clauses referring to the past as a single unit.

The core of epistemic modality and especially that of epistemic *must* is that the speaker makes inferences and uses his logic when doing so. Often the speaker's confidence is rather overtly expressed in the clause in the form of hedges (Coates 1983, 41). Hedges are characteristic of epistemic *must*, but they cannot be found with root *must*, as illustrated below:

- (21) "Such impudence", answered Mrs. Atkinson, "[[must]] exceed, *I think*, all belief; but, when women once abandon that modesty which [--] (leuven\1710-1780\fielding – amelia.txt, Line 8059)
- (22) [--] Duval, by way of justification for not answering his challenge; and *I think* he [[must]] allow the validity of it; for a frozen brain is as unfit to answer a challenge [--] (leuven\1710-1780\chesterfield – letters to his son on the art....txt, Line 5942)

According to Coates (1983, 41), the reason for this is that by using hedges, the speaker expresses that he is making judgments of something, that he is somewhat uncertain of the matter. However, if the hedges are left out from most clauses they could be interpreted as expressing root *must*. As regards the examples above, example (22) illustrates clearly how it would be expressing sense 1 if the hedge was left out since the clause would lose its nature of uncertainty. However, example (21) represents a somewhat more complicated case since there is still a feeling of inference left after the hedge has been omitted. Therefore, the interpretation of this particular example proves that one should consider each clause with care and avoid making abrupt generalizations.

There are various adverbs which can be used in order to emphasize the meanings of *must*. Depending on the type of the adverbs, they can express either root or epistemic meaning. Sometimes it might be difficult to even interpret a clause if there is no adverb which could act as "an activator" for finding the right meaning. However, in the following cases it would have been possible to interpret the clauses even without the adverbs, for *necessarily* refers to the root

meaning and *certainly* to the epistemic meaning of *must*:

- (23) Now this alteration [[must]] *necessarily* take place upon the least reflection; since it is evident, that [--] (leuven\1710-1780\hume – treatise of human nature.txt, Line 10351)
- (24) [--] met at a house hard by, directed us hither. Miss Neville: *Certainly* it [[must]] be one of my hopeful cousin’s tricks, of whom you have heard me talk so often; (leuven\1710-1780\goldsmith – she stoops to conquer.txt, Line 1345)

Finally, one example was also found with the word *needs* in it. As mentioned before, *needs* can also be classified as an adverb since it functions in a same way. Moreover, it belongs to a literary style and is fairly rare. If used, the word expresses the meaning ‘must inevitably, necessarily’ and thus, belongs with root *must*. Here someone is laying an obligation on the speaker to act which means that it is a question of sense 1. Because of the word *needs*, the obligation is even more emphasized than usual:

- (25) [--] advise Hartshorn, or something that shall close your eyes. Or, if you *needs* [[must]] write, write Caesar’s praise, You’ll gain at least a knighthood, or the bays. (leuven\1710-1780\pope – an essay on man.txt, Line 3492)

As a conclusion it can be said that the first part of the CLMET offered a plenty of examples which were fairly characteristic of both root and epistemic *must*. I suspected that the number of examples expressing sense 1 would be clearly higher than those expressing sense 6, and this expectation proved to be correct. It will be interesting to see whether the second part of the CLMET will bring any changes to this relationship.

4.2 The CLMET 2 (1780-1850)

The second part of the CLMET covers the latter part of the 18th century as well as the first half of the 19th century. The search string “must” produced 4 842 tokens, of which I analyzed 485 examples. 356 were connected to the root meanings, that is, 94 occurrences per 100 000 words. In addition, 129 examples were connected to the epistemic meanings, that is, 34 occurrences per

100 000 words. After counting the frequency for the overall tokens of “must”, the figure was 127 occurrences per 100 000 words.

4.2.1 Findings on root *must*

After analyzing the meanings of root *must*, it became evident very quickly that the term fuzziness could also be connected with the examples in this part. In other words, senses 1 and 6 were rather easily identified whereas others were used as overlapping with one another. As there were fairly many examples in the CLMET 1 that expressed the strongest degree of compulsion as well as few of those which expressed the weakest degree of compulsion, here the figures were somewhat different. This is illustrated in table 3 below.

Root MUST	Tokens	Proportion
Sense 1 ('something is necessary')	217	61.0 %
Sense 6 ('verbs of saying, a cognition verb')	41	11.4 %
Other senses	98	27.3 %

Table 3. Tokens and proportions of the senses in the CLMET 2

To begin with, the number of tokens for ‘other senses’ has increased considerably (cf. table 2).

Consider the following examples and especially the subjects in the clauses:

- (26) [--], and that you pursued your intended avocation with success. God bless you! *I* [[must]] leave off, for we are going out. (leuven\1780-1850\ austen – letters to her sister.txt, Line 245)
- (27) Will can prove this. *I* [[must]] find Will. He wasn't to sail till Tuesday. There's time enough. (leuven\1780-1850\ gaskell – mary barton.txt, Line 16529)

The reason for this is that a large number of the examples included under this heading illustrated

sense 4 which expresses the speaker's inner compulsion. In other words, the subject is usually in the first person. Furthermore, "the speaker [--] exercises authority over himself, appealing to his own sense of duty, expediency, etc." (Quirk et al. 1985, 225). In addition, the number of passives increased at the same time. These two factors together made up the increase in the figure of 'other senses'.

The overall number of tokens for sense 1 was somewhat higher in the CLMET 2 but despite this, the proportion decreased almost nearly 20 %. At the same time, the figures for sense 6 remained more or less the same. Some possible explanations for this development can be found. First, all examples associated with negation found in the data were once again connected with sense 1. As was the case with the CLMET 1, if *must* is paired with a verb of saying or knowing and then a negative form is added into the clause, its meaning changes from sense 6 to sense 1:

- (28) [--] to him at a period highly critical for the affairs of Eastern Europe. I [[must]] *not tell* you his family name; my mention of his title can do him no harm, [--] (leuven\1780-1850\kinglake – eothen.txt, Line 8972)

Second, in the CLMET 2, the number of tokens related to sense 6 was a little higher than in the previous part of the corpus. However, this number could have been even higher, for there were quite a few examples in the data where the verbs of saying or knowing occurred with the first person subject and hence, were categorised under 'other senses'. Despite this, *must* occurred with different types of verbs which all were associated with sense 6. The most usual verbs which expressed some type of saying were *tell* (5 occurrences), *say* (3 occurrences) as well as *repeat* and *beg* (2 occurrences each). Verbs related to some type of a cognition process were more commonly used than those of saying. The following were found most often: *know* (6 occurrences), *see* and *remember* (5 occurrences each), and *think* (3 occurrences). If we consider the verb *remember*, an interesting feature can be noticed:

- (29) Allowing the case, however, to stand according to your representation, you [[must]] *remember*, Miss Bennet, that the friend who is supposed to desire his return [--] (leuven\1780-1850\ austen – Pride and prejudice.txt, Line 1822)
- (30) [--] in the hemisphere should be unable to blight my designs.... Heaven and Earth! [[Must]] *I remember?* my damned star wheeled about to the zenith, by whose baleful [--] (leuven\1780-1850\ burns – letters 1780-1796.txt, Line 1865)

Example (29) clearly denotes sense 6 because *must* occurs before *remember*. In addition, no strong obligation is involved in the clause, which becomes apparent from the context. The interpretation of example (30) is, however, of more interest to us here. One would assume that since *must* is technically placed before *remember*, it is necessarily the case of sense 6. I think that the rule related to interrogation which was discussed in section 3.4.2.1 is also applicable here: *must* can be used in the types of questions “in which it has already been suggested or implied that there is a necessity” (Palmer 1979, 96). In other words, in an assertive clause the construction *must + remember* denotes sense 6 but when used in interrogatives, there is a change of meaning and thus, the clause denotes sense 1.

There were a couple of odd examples in the data where *must* was placed before a fairly typical verb of saying:

- (31) [--] that this course would be the most terrible, the most efficient warning. She [[must]] *speak*; to that she was soul-compelled; but to whom? She dreaded addressing [--] (leuven\1780-1850\ gaskell – mary barton.txt, Line 9406)

Normally, this clause would be interpreted as denoting sense 6 since it has all the features required. However, if we take a closer look at the whole surrounding context it becomes evident that the speaker is laying an obligation to the woman in question or thinking that it is necessary for the woman to speak. Moreover, it is usually the case with examples illustrating sense 6 that the construction *must + a verb of saying or knowing* would be followed by a subordinate clause or *that*-clause in particular. This construction is not illustrated in (31). Thus, I am of the opinion that the example above illustrates sense 1. These types of examples are found and their existence

is a proof that the interpretation of the meanings of *must* is hardly ever unambiguous.

4.2.2 Findings on epistemic *must*

It was already noted in connection with the CLMET 1 that epistemic *must* is very often connected with stative verbs such as *be*. This was also noticeable in the CLMET 2 as there were quite a few examples in which this pattern could be seen. However, there was only one occurrence of root *must* + *be* in the CLMET 1, but the same pattern occurred several times. As mentioned before, root *must* which is related to a stative verb almost without an exception denotes sense 1:

- (32) [--] therefore, you are anxious to join us, we shall be glad of your aid. But you [[must]] *be* content to follow, and not lead -- and to act as you are directed – [--] (leuven\1780-1850\ainsworth – windsor castle.txt, Line 12199)

Moreover, other verbs besides *be* were also used in connection with epistemic *must* which were used in order to express the stative aspect. These verbs included *have*, *appear*, *belong* etc. In addition, it should also be mentioned that the number of passives in the CLMET 2 was fairly high. The passives were associated both with root and epistemic *must*, which was quite interesting. As for root *must*, a similar type of trend was noticed than in the CLMET 1: if a verb of saying or knowing occurs in an active clause, it is a case of sense 6, as in (33). Similarly, if it is found in a passive clause, it expresses a necessity and therefore, also sense 6, as in (34):

- (33) “Do you understand me?” “Yes, perfectly, Ready; but I am now, I [[must]] *confess*, really frightened; if anything was to happen to you, what a misery [--] (leuven\1780-1850\marryat – masterman ready.txt, Line 10411)
- (34) “Your privacy!” “--ha ! --ha ! You bear yourself bravely, it [[must]] *be confessed*. My lords, you heard the voices as well as myself. (leuven\1780-1850\ainsworth – Windsor castle.txt, Line 3358)

However, the passives were not restricted entirely to the root meanings but they were also found with epistemic *must*. Example (35) refers to the past since the speaker is using inference and therefore, it is a question of epistemic *must*. Moreover, the example is in the passive form and the

subject is introduced by using an agent:

- (35) [--] cried Henry, turning away in disgust. “How came it there?” “It [[must]] *have been brought by* the powers of darkness”, said Bouchier; “no such coffin [--] (leuven\1780-1850\ainsworth – windsor castle.txt, Line 10294)

Before moving on, one further remark needs to be made concerning the use of passives. As have been mentioned before, passives do not express as strong degree of compulsion or necessity as active clauses. However, since epistemic *must* is not categorised similarly to root *must* the passive constructions found in the epistemic examples will not be compared with those examples which have root *must* in them.

Epistemic *must + be* can also occur in some others constructions. Quirk et al. (1985, 235) suggest that although the modals are not often found with constructions related to perfective and progressive aspects, certain combinations are, however, used. Not all modals can be combined with these aspects but *must* is one of which this is possible to find. There were some examples illustrating the progressive aspect found in the data:

- (36) [--] spoke there was a sort of smile which Elizabeth fancied she understood; he [[must]] *be supposing* her to be thinking of Jane and Netherfield, and she blushed as [--] (leuven\1780-1850\ austen – Pride and prejudice.txt, Line 6539)
- (37) [--] had occupied his sole thoughts for several years, and he concluded that I [[must]] *be thinking* of what he was. I believe, however, I may say I am nearly the [--] (leuven\1780-1850\hazlitt – table talk.txt, Line 2990)

As can be seen above, the examples should be interpreted according to the epistemic sense, which is also suggested by Declerck (1992, 409) as well as Quirk et al (1985, 224-225). As was mentioned earlier (in section 3.4.1), this construction can often be interpreted as expressing dynamic aspect. I found also a couple of interesting examples from the data which clearly were not cases of epistemic but root *must*. Here is one of them:

- (38) I couldn’t eat, and it’s best to be off. I cannot be still at home. I [[must]] *be moving*. So saying, he unlaced her soft twining arms, [--] (leuven\1780-1850\gaskell – mary barton.txt, Line 11995)

In the interpretation of (38), there are two elements which suggest that it has to be root *must* and more precisely, sense 1. First, it is clearly a question of a necessity, which means that something has to be done. And second, example (38) is not followed by a subordinate clause (cf. example (31) in section 4.2.1) which is characteristic of epistemic senses of *must*. Therefore, I feel that this example can be interpreted as denoting root meaning.

When I analyzed the data, I was able to find similar types of adverbs to those in the CLMET 1. These adverbs are functioning as intensifiers in the clause, that is, they reinforce the meanings of *must*. Adverbs such as *surely* and *certainly* occurred more than once with epistemic *must*, whereas *necessarily* was connected with the root meaning. The expression *I am sure* occurred once in the data, and like Coates (1983, 45), I decided to include it with this group since it expresses the speaker's confidence in the truth as well:

- (39) [--] with one who *I am sure* merits ALL YOUR AFFECTION, but that, although such ties [[must]] of course be the strongest and most sacred, and supersede ALL OTHERS, [--] (leuven\1780-1850\thackeray – vanity fair.txt, Line 12072)

As I suggested when discussing the root *must* in the CLMET 1, there are cases in which certain examples can be interpreted as denoting root *must* instead of epistemic *must* if the adverbs or hedges such as that in (39) are left out. It is, of course, not invariably like this but every example needs to be examined separately.

At this point it can be said that there is no clear evidence of the decrease in the root meanings of *must* and thus, that they would be replaced by epistemic senses. As far as the strongest and the weakest senses of root *must* are concerned, it is evident that there is a tendency to use less of the stronger senses. Since more evidence is still needed I will next turn to the third part of the CLMET.

4.3 The CLMET 3 (1850-1920)

The third part of the Corpus of Late Modern English Texts (CLMET) includes texts from 1850 to 1920, and so these texts offer a glimpse of the more recent English as well. The same search string “must” was used again and it produced 5 582 tokens, of which I analyzed 558 examples. 395 examples were connected with the root meanings of *must*, that is, 104 occurrences per 100 000 words. Besides the root meanings, 163 examples were connected with the epistemic meanings, that is, 43 occurrences per 100 000 words. The frequency for the overall tokens was counted as well, and it was 147 occurrences per 100 000 words.

4.3.1 Findings on root *must*

Must can be considered as a highly polysemous (Perkins 1983, 36), which became once again very obvious when I analyzed the examples in the CLMET 3. The same pattern was repeated as in the other corpora, that is, there were plenty of examples in which either sense 1 or sense 6 was a dominating one. Interestingly, the percentages for each of the three categories remained more or less the same as in the CLMET 2, which can be noticed in table 4 below:

Root MUST	Tokens	Proportion
Sense 1 (‘something is necessary’)	242	61.3 %
Sense 6 (‘verbs of saying, a cognition verb’)	48	12.0 %
Other senses	105	26.2 %

Table 4. Tokens and proportions of the senses in the CLMET 3

The category ‘other senses’ consisted once again mainly of examples which denoted sense 3 (‘an instruction or order’) or 4 (‘question of inner compulsion’). Besides these types, I found the first example representing sense 5, that is, that someone is making a kind offer or invitation (cf. table 1). It expresses a rather weak degree of compulsion since it is placed almost at the other end of the scale:

- (40) ‘Hungry, too’, she said, seeing the crust Marian was nibbling. ‘You really [[must]] have more lunch, dear. It isn’t right to go so long; you’ll make yourself ill. [--] (leuven\1850-1920\gissing – new grub street.txt, Line 3854)

As far as the more relevant senses, those of 1 and 6, are considered, the interpretation of the examples was sometimes unclear and difficult. This same phenomenon was already briefly touched upon when discussing example (31) in section 4.2.1. First of all, there were plenty of different verbs in the data which expressed some type of saying or could be associated with cognition and thus, were related to sense 6. The verbs expressing saying of some type which occurred most often after *must* were *say* (7 occurrences), *admit* and *own* (4 occurrences each), and *confess* (3 occurrences). The most typical cognition verbs were *remember* (8 occurrences), *know* (5 occurrences) and *think* (3 occurrences). What made the interpretation of the examples especially difficult in the CLMET 3 was that these verbs, which are usually characteristic of sense 6, were very often used in examples denoting sense 1 as well:

- (41) About seven o’clock he came to the kitchen door. “I [[must]] *spea*k with you,” he said. His tone impressed Sophia. (leuven\1850-1920\bennett – the old wives’ tale.txt, Line 12522)
- (42) Harriet slumbered in a compartment by herself. He [[must]] *ask* her these questions now, and she returned quickly to her down the corridor [--] (leuven\1850-1920\forster – where angels fear to tread.txt, Line 6399)

The use of these particular verbs of saying made it somewhat confusing to interpret the clauses. However, example (41) can be compared with (31) since it is not followed by a subordinate clause. Moreover, the clause implies that the person is obliged to speak to the hearer and hence, it

is a question of sense 1. Similarly, example (42) has to be interpreted in the same way because there is no subordinate clause after the main verb but an object instead. As can be seen, one cannot consider these types of clauses as exceptions since they are found fairly often in different texts. What needs to be taken into account is that *must* cannot be interpreted only according to one particular group of verbs and automatically categorised into some class, but the surrounding text must be considered as well.

There were quite a few examples in which either negation or interrogation was found. As I have mentioned before, these constructions are usually connected with root *must*, and no exceptions were found here. In the case of negation, other forms than the most usual *not* were also used in order to negate the situation in the clauses, for example *no longer* and *nobody*, as in example (43). As for the interrogation, a clearly higher number of examples were found than in the other two corpora. Moreover, there was often some type of a *wh*-element before *must* in the clauses such as *which*, *what* or *why*, as in (44):

- (43) Hudge proves from Tolstoi that *nobody* [[must]] take arms against anything. Gudge is naturally a healthy and well-washed [--] (leuven\1850-1920\chesterton - what's wrong with the world.txt, Line 5722)
- (44) [--] at this time o'night!" said Boldwood in amazement, and starting up. "Why [[must]] you meet her?" "She was expecting me to-night – and I must now speak to [--] (leuven\1850-1920\hardy – far from the madding crowd.txt, Line 5355)

As Palmer (1979, 26) suggests, *must* can occur with other negative forms as well. It does not matter what kind of a negative form is used in a clause because the same rule is applied every time: it is the main predicate that is negated, not the modal. However, the meaning remains the same or more specifically, the negative of sense 1 (*It is necessary for you not to...*) (Coates 1983, 39).

Next I will discuss my findings concerning epistemic *must* in the data and also say how they can be related to the comparable findings on root *must*.

4.3.2 Findings on epistemic *must*

It is most often the case that stative verbs are associated with epistemic *must*. In some instances, however, they can occur with root meanings as well but in these cases, one needs to think whether the basic meaning of the clause can be interpreted as ‘*It is necessary for...*’ (Coates 1983, 32). Compare the examples below:

- (45) [--], for the King’s notoriously lax and careless about such matters. But you [[must]] *be* as civil as butter to the Cardinal. We hope to win him over, because he [--] (leuven\1850-1920\hope – the prisoner of zenda.txt, Line 1245)
- (46) [--] she saw that after all the almanacs had not lied. Look at Fan! Yes, it [[must]] *be* five years since the memorable morning when doubt first crossed the minds [--] (leuven\1850-1920\bennett – the old wives’ tale.txt, Line 1789)

Example (45) expresses a necessity and thus, it illustrates root meaning. In some cases, one might also say that *must* is used here because it indicates a rule or law (Collins Cobuild English Dictionary). If so, it should be classified under the category ‘other senses’ (cf. example (3) in section 4.1.1). In (46), there is not a question of laying an obligation on someone (Palmer 1979, 62) but rather that the speaker is confidently inferring that something is possibly true. Therefore, it must be interpreted epistemically.

The root-epistemic contrast was also illustrated in some other examples in which the stative verb *be* was present. Consider the following:

- (47) [--] He has given you such courage! But you must have suffered – I know *you* [[must]]; ‘and she tenderly kissed her daughter. (leuven\1850-1920\rutherford – clara hopgood.txt, Line 1854)

The relevance of the surrounding context and more precisely, the previous sentence is highlighted in this case. If one only reads the sentence *I know you must*, it could be thought to refer to sense 1. However, there are two clues which suggest that the clause might be expressing epistemic *must*. First, it is necessary to take into account the clause before, which reveals that the two clauses refer to the past. It becomes evident when one tries to paraphrase the second *must* with

either ‘*It is necessary for...*’ or with ‘*I confidently infer that...*’. Hence, this is clearly an indication of epistemic sense. Second, there is the hedge *I know* right before *must*, which is also a marker of epistemic meaning. When summing up these together, it becomes evident that the crucial part has been deleted after *must*. Without the omission, the clause would look like this according to the previous sentence: *I know you must have suffered*.

It was mentioned in the connection with the CLMET 2 that *must* unlike some other modals can be found with both progressive and perfective constructions (Quirk et al. 1985, 235). The progressive aspect expresses more of a dynamic state or activity, which means that something is happening at the very moment of speaking (Palmer 1979, 91). As said before, I do not separate dynamic modality as its own category but include it within the epistemic senses. In the CLMET 3, one example could be found in which the perfective aspect was expressed:

- (48) [--] there, who immediately decamped in consequence. The boys thought that Diggs [[must]] have been watching. When therefore, about this time, an auction was one [--] (leuven\1850-1920\hughes – tom brown’s school days.txt, Line 5277)

Like in the progressive examples illustrated in connection with the CLMET 2, here the dynamic aspect is underlined more clearly. In other words, the use of *have* after epistemic *must* implicates actuality (Palmer 1979, 97). This means that the event has been actualized in the past where it has continued for a particular time. Since this was the first one of this particular type, I feel that they are used only rarely in the texts.

Finally, there is one more point to be made. As I have mentioned earlier, adverbs can be used to emphasize the meaning of *must*. Here a few illustrations of this were found, as in the previous corpora. More interestingly, the word *needs* was used more often than in the CLMET 1 or 2, although one would expect it to become even less frequent due to its rare and literary nature (Quirk et al. 1985, 589):

- (49) [--] the streets where the faces of beautiful women would encounter him. When he [[must]] *needs* leave the house, he went about in the poor, narrow ways, where only [--] (leuven\1850-1920\gissing – new grub street.txt, Line 23056)

As I have pointed out, *needs* is used in order to emphasize the root *must*, which is evident in (49) as well. Besides the role of *needs*, I think that root *must* in this particular sentence can be interpreted as referring to the past due to the preterite form in the following sentence. This is an exception since root *must* does not have preterite forms but it is often replaced by *have to* (Declerck 1992, 384). I am of the opinion that this is a case of root *must* referring to the past and thus, the clause could be paraphrased as ‘*When he had to leave the house, he went about in the poor, narrow ways...*’.

So far I have discussed the three different parts of the CLMET. I have only taken those examples from the corpora which illustrate most clearly the differences between senses 1 and 6. In addition to this, I have discussed those features associated with epistemic *must* which I could have contrasted with root *must* and possibly the two senses. In order to have a wider aspect yet, I will next discuss examples from the fourth corpus analyzed, which was LOB.

4.4 LOB

The LOB corpus consists of a variety of texts from different genres. According to Leech (2003, 222), only such texts which represent the written British English genres have been included into LOB. This makes it compatible with the data presented above, that is, the three parts of the CLMET. Although this corpus contains only a million words, which is clearly less than in the CLMET, it adds a point of comparison from the more recent English.

The search string “must” yielded 963 tokens altogether and since I analyzed 25 % of these, the total number of examples became 241. Of this 167 examples were related to the root

meanings of *must*, that is, 67 occurrences per 100 000 words. Moreover, 74 examples were related to the epistemic meanings of *must*, that is, 30 occurrences per 100 000 words. As regards LOB, the overall frequency for the 963 tokens was 96 occurrences per 100 000 words.

4.4.1 Findings on root *must*

The root meanings of *must* was still fairly frequently used in LOB, which was little surprising since one could have expected that the numbers might have decreased somewhat more. It must be confessed, however, that there is a clear decrease in the use of root *must* when compared to the CLMET 3. The use of epistemic *must* does not show a very notable increase, although some implications concerning the use of epistemic *must* becoming even more frequent can be seen.

As regards the different senses, it must be pointed out that there was a clear decrease in the proportion of sense 1 which denotes the strongest degree of compulsion. Moreover, the proportion associated with sense 6 decreased also a little, whereas the proportion for ‘other senses’ increased at the same time. The exact figures are shown in table 5 below:

Root MUST	Tokens	Proportion
Sense 1 (‘something is necessary’)	95	56.9 %
Sense 6 (‘verbs of saying, a cognition verb’)	16	9.6 %
Other senses	56	33.5 %

Table 5. Tokens and proportions of the senses in LOB

As mentioned above, there were not as many examples associated with sense 1 in LOB as there

were in all three parts of the CLMET. Moreover, nearly half of the examples denoting sense 1 had the third person subject, which often expresses somewhat weaker sense of compulsion (Coates 1983, 37) or a general proposition (the *OED*), whereas the first and second person subjects express more of a necessity or an insistent request. On the contrary, the percentages for ‘other senses’ increased quite notably. Almost all the examples included in this category were in the passive, which means that they denote sense 3 and are placed in the middle of the scale expressing a degree of compulsion in between the strong and the weak (cf. table 1):

- (50) This is not necessarily a recipe for maximum popularity. But popularity by itself is not a good test of the performance of a paper. A paper [[must]] *be prepared* to be unpopular when necessary – especially a local one which is sometimes exposed to pressures at close quarters to soft pedal or even suppress when its job is to be [--] (LOB\14126\B19 156)

I expected that sense 6 would have been used more often than previously but it was not the case.

Out of the 16 occurrences in LOB, half were in the active and half were in the passive form:

- (51) ‘But they have guns. Look.’ He pointed. He couldn’t believe his eyes. ‘You [[must]] *think* I like the military sticking its nose in.’ I said bitterly: ‘We spend our lives running things the quiet way.’ (LOB\78108\K09 132)
- (52) We are far too ignorant of each other’s lives. Surveys and Reviews. RECENT BOOKS ON TOLSTOI IN ENGLISH. *It* [[must]] *be admitted* that none of the books on Tolstoy, in English, which have appeared in the last decade is worthy of his greatness. (LOB\51019\G62 126)

However, these both clauses express equally sense 6 although one can make a subtle distinction in tone (cf. 4.1.1). Moreover, the verbs characteristic of sense 6 were used in a variety of different ways in the examples. In other words, only *remember* and *admit* were used several times (4 occurrences each), whereas all the other verbs expressing saying or a cognition process occurred only once. As far as these particular verbs are concerned, the interpretation of the different senses was rather simple because they were mainly used in connection with sense 6 instead of both sense 6 and 1 as previously.

There were quite a few examples in the data which had either *not* or other negative

forms associated with them. The interpretation of the following example required some attention on the part of the reader since the negative form is not fully marked:

- (53) [--] seem more and more able to dispense with it and to rely on their God-given natural voice which is, after all, but part of the equipment necessary for fine opera performances.) *Nor* [[must]] *we* forget the great singer who insists on being centre-stage or who shouts a top note even in spite of the composer's wishes, [--] (LOB\47361\G43 173)

It becomes evident that it is a question of a negative pair *neither – nor*, although the former is not mentioned in this particular extract. The latter, however, affects the clause similarly to other negative forms and therefore, the clause expresses a necessity.

Interrogations were also exemplified in LOB. The two types previously discussed were illustrated in the examples: the most usual construction where the modal is placed before the subject and the *wh*-element before the modal and the subject. There was also one example in which *must* was used in a tag question:

- (54) [--] ago for a meeting of the Licensed Victualler's Association. Shaken, for Evans was. But not showing it, mind. "Mustn't [we] expect too much on these Welsh roads, [[must]] we now?" he said, very conciliatory. "Not on the M1, are we?" (LOB\87434\M04 62)

Example (54) is quite interesting since the combination *must + not* has a different meaning than the modal itself. It should also be noticed that the negation always affects the main predicate or the event, not the modal. Palmer (1979, 29) suggests that *must* can still be used in tag questions if one interprets the positive tag with such question as '*Is it not the case that he mustn't?*' In this case, there will be two negatives which "cancel each other out, *must* being essentially *mustn'tn't*" (ibid.). Because of the complexity which is associated with tag questions involving *must*, other modals are often utilized instead in order to avoid misunderstandings in interpretations (Declerck 1992, 385).

Before moving on to discussing the features of epistemic *must* found in the data, the

conclusion that could be drawn on the basis of the results related to the different senses of root *must* is that there is a tendency to use less of those examples associated with the strongest sense of compulsion and more of those associated with somewhat weaker senses.

4.4.2 Findings on epistemic *must*

At this point one can confidently state that epistemic *must* is very often associated with stative verbs and particularly with *be*. This became evident after analysing the examples in the LOB corpus. This also proves Coates' claim (1983, 42) concerning the nature of epistemic *must* to be correct. The fact that epistemic *must* has to do with logical inference was expressed in various ways in the examples:

- (55) [--] want to police the Congo when the Congo itself can do the job. All the UN contingents will be glad to go home. Meanwhile every statesman in Africa must realise that there [[must]] *be* far worse consequences if the UN had to abandon its task. (LOB\10178\B01 158)
- (56) [--] leaving only local authorities and non-profit-making associations to provide for those unable or unwilling to buy their own houses. If the trend continues the time [[must]] *come* when the remnant of privately let houses will be insufficient to provide a basis for ascertaining standards of rents such as are needed to assess rateable values [--] (LOB\28286\E28 102)

Besides expressing logical inference, there is also one very typical feature in example (55) which is often connected with epistemic meaning. That is the existential subject *there* in front of *must* (Coates 1983, 44). The use of *there* gives the reader a feeling that the proposition is possible or plausible because the speaker believes it to be so. As regards example (56), it could be interpreted as denoting root *must* and more precisely, sense 1. In this case, the example should be paraphrased as '*If the trend continues it is necessary for the time to come...*'. However, I am of the opinion that the speaker is expressing his confidence concerning the trend that is currently going on. Thus, the example sounds more appropriate if it is paraphrased something like '*I*

confidently infer that if the trend continues, the time will come when the remnant of privately let houses ...'.

I have discussed the use of hedges as a marker of epistemic *must* in clauses. There were quite a few examples in LOB where these markers were utilized in different ways:

- (57) [--] a very new and expensive phaeton – with a pair of fine horses in the shafts that Horatia recognised at once. ‘Why’, she cried gladly, ‘*I believe* it [[must]] *be* Mr. Latimer! I’d know that cattle anywhere!’ Hudson glanced at her oddly, but he said no more than a mild, [--] (LOB\80061\K19 136)
- (58) [--] as when old patriarchs come to grace a marriage. I felt by now extremely sick again and practically suffocated with excitement and with something which *I supposed* [[must]] *be* desire. I turned into the street where Honor Klein lived. (LOB\79223\K15 66)
- (59) After the flock had walked towards me a little, they sat for a while, and then *I think they* [[must]] *have scented* me, for away they went, crossing my creek further down and joining some more geese on the mud to the west. (LOB\42446\G17 165)

These examples have two features in common. They all express epistemic meaning, and the speaker is using a hedge in order to introduce his statement of inference. Example (57) illustrates a fairly typical type in which both the hedge and the clause following it refer to the present state. In (58), the hedge is marked for past tense (*I supposed*) whereas the epistemic *must* refers clearly to the present as in (57). Finally, in example (59) the hedge *I think* expresses that the speaker is judging the proposition, which has happened in the past, at the very moment of speaking. As can be seen, the use of hedges is quite versatile. It is important to distinguish them from the clauses since they might sometimes be the final way when deciding whether the clause should be interpreted according to either root or epistemic meaning.

There have been at least some occurrences of adverbs relating to both root and epistemic *must* in each part of the CLMET. In the case of LOB, only adverbs associated with epistemic *must* were found. To be more precise, there was only one adverb which occurred more freely with epistemic *must*. That was the adverb *surely*:

- (60) That of Princess Margaret and Peter Townsend. If ever there was a modern fairy-tale that went wrong, then Margaret's and Peter's [[must]] *surely be* it. After two long years, [--] (LOB\34062\F18 162)
- (61) In the minute which it took Appleby to absorb all this, Veere House was as soundless as the tomb. If the false Astarte were really here, it [[must]] *surely be* in the character of a Sleeping Beauty. In which case, Jimmy Heffer had certainly taken on the role of Prince Charming. (LOB\84518\L13 87)

As Perkins (1983, 90) points out, the adverb *surely* is used “to confirm the speaker’s assessment of the truth of the proposition”. Thus, it has exactly the same function as epistemic *must* generally. Without this particular adverb, examples (60) and (61) would be more difficult to interpret.

The complex nature of *must* and more specifically, how the different senses of root *must* have developed during the past three centuries is gradually becoming clearer as I have analyzed the findings from the three parts of the CLMET as well as LOB. In order to be able to draw more precise conclusions as regards the use of *must*, the findings from each corpus need to be compared with one another. Thus, I will next discuss the corpus data in general as well as suggest what might be the reasons for this particular development.

5. General remarks on the data

It is often difficult to detect any major grammatical changes when studying specific linguistic phenomena, especially if those changes were to take place within a restricted period of time (Leech 2003, 223). Therefore, I chose to study the modal *must* and examine its different uses from 1710 to 1961. Before moving on to analysing the corpus data, I will briefly point out some drawbacks one needs to take into account when conducting such studies.

As regards this particular study, the first limitation that needs to be considered is that only British English variety has been studied here. Without another regional variety, such as American English, it is difficult to compare the findings and thus, draw more common conclusions concerning grammatical changes that are taking place in language. As Leech (2003, 226) suggests, grammatical change is to be found more frequently in the spoken language. If this is the case, another obvious limitation of this study is that the focus is merely on the written medium. However, one needs to remember that if grammatical changes first take place in the spoken language, they will eventually spread into the written language as well, although the changes would be noticeable somewhat later on.

When I studied how the modal *must* has been used during the past three centuries, I noticed some interesting features while analyzing the examples. Before discussing these features more in detail, I have gathered the occurrences of root and epistemic *must* per 100 000 words in the corpus data and illustrated them in Figure 1 below:

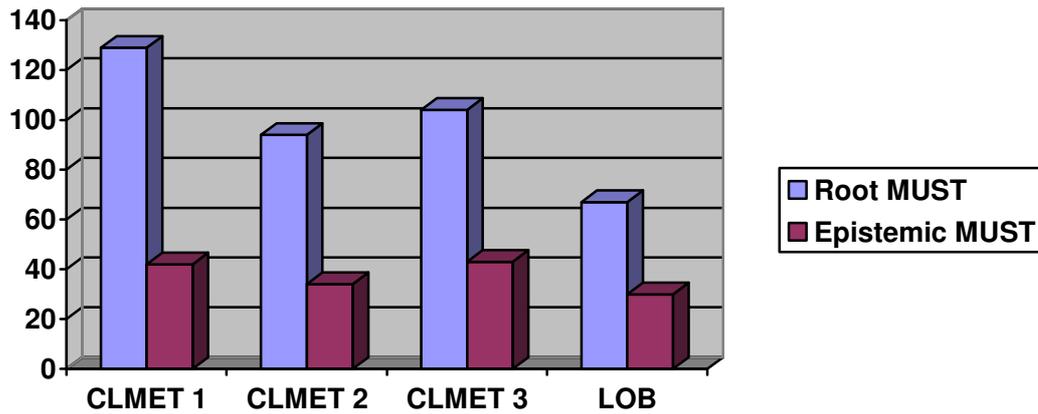


Figure 1. Occurrences of root and epistemic *must* per 100 000 words in the data

As can be seen from Figure 1, the root meanings of *must* are clearly more frequent in each corpus. The use of root *must* is showing a fairly considerable decrease when comparing the CLMET 2 to CLMET 1, whereas the epistemic uses are not increasing at the same pace.

However, in the third part of the CLMET the root meanings have increased again, but so have the epistemic ones as well. In the case of LOB, the root meanings of *must* are suddenly developing a downward trend and the decrease is actually fairly noticeable when compared to the CLMET 3. Furthermore, the bar illustrating epistemic *must* is also indicating that the gap between the two meanings is shrinking gradually. In order to be able to say something more specific of this general development, one should also consider how the use of different senses of root *must* can be related to the overall development.

I also studied how the different senses of root *must* have changed during the past three centuries. This study was conducted because I feel that it is important to see whether the senses expressing a weaker compulsion will become more frequent in more contemporary texts. If so, this would be a clear indication that since the weaker senses are being favoured over the

stronger ones, there is not necessarily a long way until the epistemic meanings will be used.

Moreover, I think that the crucial point here is to understand that the changes in the use of the different senses are in straight connection with the changes that might take place as regards the use of the root and epistemic meanings of *must*. Figure 2 presents the different senses and how the proportions have changed in the period covering the years 1710-1961:

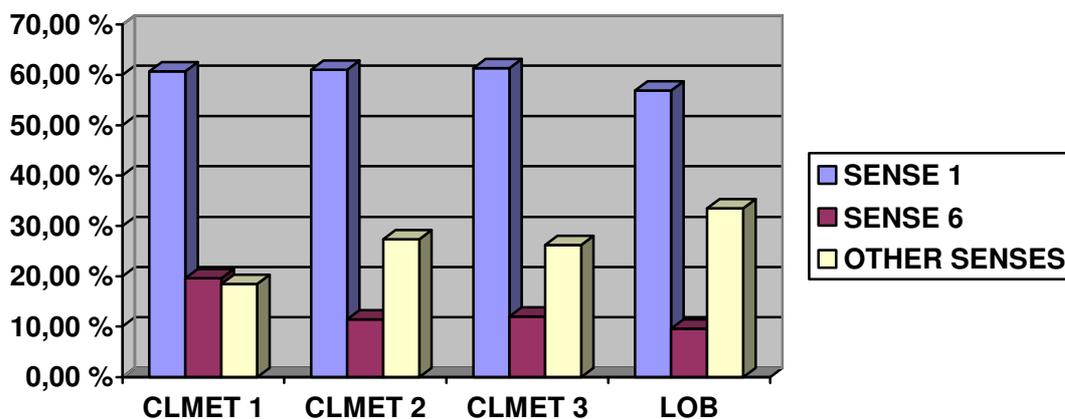


Figure 2. The proportions of different senses in the data

There are some fairly noticeable fluctuations among the different senses in the corpora, as is illustrated by Figure 2. It seems that sense 1, which denotes the strongest degree of compulsion, is used in quite a same way in each part of the CLMET. Actually, the use of sense 1 is increasing a little until the CLMET 3. This type of development is not, however, unusual for some modals. In Leech's view (2003, 235), there is evidence that "one sense tends to dominate, in frequency, over others". Interestingly, sense 1 suddenly shows a downward trend in LOB. A similar type of development was noticed in Figure 1 when the bar illustrating the root meanings of *must* showed a notable decrease. This might well be a sign that as time goes by, more of those senses denoting

lower degree of compulsion and eventually epistemic senses will come into use.

While sense 1 is flourishing in the historical corpus, that is, in all parts of the CLMET, it should be noted that the bar illustrating sense 6 (the weakest degree of compulsion) does not seem to grow in size but rather, decreases every once and a while. However, the bar illustrating 'other senses' is probably the most interesting here. This category covers other than senses 1 and 6 and thus, they all denote root meaning. However, as I have mentioned before, most examples included in this class denoted senses 3 and 4 which express a fairly weak degree of compulsion. As is illustrated by Figure 2, the category 'other senses' shows a clear increase almost in each corpus. In the case of LOB, the increase is most noticeable, maybe because sense 1 is decreasing at the same time.

Before concluding, I will briefly mention some possible reasons which might have their effect on the results. As was already pointed out at the beginning of this chapter, there is some evidence that language change usually takes place in spoken American English. Furthermore, it seems that the frequency of modals such as *must* is decreasing more drastically in American English than in British English, in which it is preferred to use more of the forms denoting hierarchy and power. These tendencies can also be seen in the corpus data, which illustrate the frequent use of root *must*. However, the figures in LOB already give some indications that grammatical change is well on its way also in British English, although it may not take place at such a high pace as in American English.

Finally, Smith (2003, 263-264) points out that the more personal modals *need* and *have to* have been replacing *must* more and more in the 20th century. It can be said that these modals are associated with less authority and more equality. However, *must* is still used fairly often in variety of texts as is illustrated by the corpus data. Before studying the complex relationship between *must* and other modals, it is crucial to shed more light on the different

senses of *must* only.

6. Conclusions

In this thesis, I have discussed the different meanings that can be distinguished for the modal auxiliary *must*. I was mainly interested in the possibility to draw a clear distinction between root and epistemic senses. In addition, I examined whether there have been any changes in the use of *must* during the past three centuries by utilizing two corpora, the CLMET and LOB.

In the theoretical part of the study, it could be noticed that *must* clearly shows an extension of the root-epistemic domain. If *must* expresses root meaning, it is associated with such notions as obligation and compulsion. However, if it expresses epistemic meaning, it is concerned with the speaker's judgement of the truth of the proposition. Furthermore, the root meanings are recognized as being typically fuzzy. This means that there are a number of sub-senses which can express a differing degree of obligation and compulsion. Although it may be fairly easy to distinguish between the sub-senses in theory, the task might turn out to be quite difficult or even impossible in practice.

In the empirical part of this study, some interesting observations were made concerning the use of *must* in the different corpora. The analysis of the root and epistemic meanings proved that the root meanings of *must* were fairly frequent in each corpus, showing no sharp decrease at the historical data. However, as the more recent texts were analyzed it could be noticed that there was suddenly a noticeable decrease in the use of root *must*. In order to be able to draw more precise conclusions on the matter, the different sub-senses of root *must* were examined as well.

Two sub-senses were of particular interest here, sense 1 ('something is necessary in

the speaker's opinion') and sense 6 ('*must* before a verb of saying or a cognition verb'). All the other sub-senses, most of which denoted a fairly weak degree of compulsion, were included under the heading 'other senses'. The corpus data revealed that *must* is thriving in sense 1 in the historical corpus, that is, in the CLMET. However, there is a significant decrease in the use of sense 1 as soon as one reaches LOB. As regards sense 6, it does not seem to increase in use, which is quite surprising. The most interesting findings were made concerning the category 'other senses'. These findings showed that there is a noticeable increase in the use of 'other senses' nearly in each corpus.

There are two main points that can be concluded on the basis of these findings. First, the effects of language change are usually first seen in the spoken language, which indicates that the changes will take place more slowly in the written medium. Second, American English is considered as "the powerhouse for language change" (Leech 2003, 237), whereas British English is often resistant to use new forms. These trends were also noticed in the data. Based on the corpus data, it is evident, however, that the authoritative-sounding root *must* is gradually been replaced by the more democratic and equal forms, even in British English.

Clearly, there is still a great deal of investigation to be done in the field of modality since it covers such a wide spectrum of meanings. Moreover, this study, which has focused on the modal auxiliary *must*, has been of a fairly limited size but it has still laid down some general outlines for its possible development in more contemporary English. Similar investigations of this type will likely enhance our understanding of the language change as well as the reasons behind it.

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Electronic Corpora

The Corpus of Late Modern English Texts (the CLMET) [Accessed 16 December 2006]

The Lancaster-Oslo/Bergen Corpus (the LOB) [Accessed 8 May 2006]

Appendices

Appendix A

Data: The Corpus of Late Modern English Texts, Part 1 (the CLMET 1)

Sample from the corpus

D:\leuven\1710-1780\burke - on conciliation with america.txt, Line 77, N/A:

1. ... , would not have patience to see us play the game out with our adversaries; we [[must]] produce our hand. It would be expected that those who for many years had been ...

D:\leuven\1710-1780\burke - on conciliation with america.txt, Line 102, N/A:

2. ... er; and there are occasions when any, even the slightest, chance of doing good [[must]] be laid hold on, even by the most inconsiderable person. To restore order a ...

D:\leuven\1710-1780\burke - on conciliation with america.txt, Line 185, N/A:

3. ... resources of all inferior power. The capital leading questions on which you [[must]] this day decide are these two: First, whether you ought to concede; and second ...

D:\leuven\1710-1780\burke - on conciliation with america.txt, Line 193, N/A:

4. ... we have before us; because after all our struggle, whether we will or not, we [[must]] govern America according to that nature and to those circumstances, [Footnote: ...

D:\leuven\1710-1780\burke - on conciliation with america.txt, Line 262, N/A:

5. ... reat branches: the African-- which, terminating almost wholly in the Colonies, [[must]] be put to the account of their commerce,--the West Indian, and the North Ameri ...

D:\leuven\1710-1780\burke - on conciliation with america.txt, Line 313, N/A:

6. ... s at these two periods, and all reasoning concerning our mode of treating them [[must]] have this proportion as its basis, or it is a reasoning weak, rotten, and soph ...

D:\leuven\1710-1780\burke - on conciliation with america.txt, Line 373, N/A:

7. ... r foreign and domestic commerce. This would be a curious subject indeed; but I [[must]] prescribe bounds to myself in a matter so vast and various. I pass, therefo ...

D:\leuven\1710-1780\burke - on conciliation with america.txt, Line 504, N/A:

8. ... ns to inculcate, as a fundamental principle, that in all monarchies the people [[must]] in effect themselves, mediately or immediately, possess the power of granting ...

D:\leuven\1710-1780\burke - on conciliation with america.txt, Line 623, N/A:

9. ... empire can be thrown. In large bodies the circulation [Footnote: 28] of power [[must]] be less vigorous at the extremities. Nature has said it. The Turk cannot gover ...

D:\leuven\1710-1780\burke - on conciliation with america.txt, Line 760, N/A:

10. ... s, and of all the slaves that adhered to them. Such would, and in no long time [[must]] be, the effect of attempting to forbid as a crime and to suppress as an evil t ...

Appendix B

Data: The Corpus of Late Modern English Texts, Part 2 (the CLMET 2)

Sample from the corpus

1. ... t from. If you received this etext on a physical medium (such as a disk), you [[must]] return it with your request. ABOUT PROJECT GUTENBERG-TM ETEXTS This PROJECT ...

D:\leuven\1780-1850\ainsworth - windsor castle.txt, Line 236, N/A:

2. ... the person you received it from. If you received it on a physical medium, you [[must]] return it with your note, and such person may choose to alternatively give you ...

D:\leuven\1780-1850\ainsworth - windsor castle.txt, Line 523, N/A:

3. ... scares, if he does not injure, all those who cross his path. At curfew toll I [[must]] quit the castle, and will then, with your attendants proceed to the Garter, in ...

D:\leuven\1780-1850\ainsworth - windsor castle.txt, Line 703, N/A:

4. ... grace of Norfolk?" The earl replied in the affirmative. "Why, then, you [[must]] be the young nobleman whom I used to see so often with the king's son, the Duk ...

D:\leuven\1780-1850\ainsworth - windsor castle.txt, Line 798, N/A:

5. ... me for a sheep or a bullock, that you attack me in this fashion? My strong ale [[must]] have got into your addle pate with a vengeance. "The knave has been speakin ...

D:\leuven\1780-1850\ainsworth - windsor castle.txt, Line 1017, N/A:

6. ... s tell us he used to split the arrows of his comrades in that fashion." "He [[must]] have learnt the trick from Herne himself in the forest," cried one of the byst ...

D:\leuven\1780-1850\ainsworth - windsor castle.txt, Line 1305, N/A:

7. ... gerous gift altogether, and to think no more of the fair profferer, or if thou [[must]] think of her, let it be as of one beyond thy reach. Cross not the lion's path ...

D:\leuven\1780-1850\ainsworth - windsor castle.txt, Line 1443, N/A:

8. ... she shall not have to reproach me with disobedience," rejoined the earl. I [[must]] interpose to prevent their utterance," cried Richmond, with a somewhat jealous ...

D:\leuven\1780-1850\ainsworth - windsor castle.txt, Line 2115, N/A:

9. ... could not help laughing at his companion, telling him that the supposed vision [[must]] have been the offspring of his over-excited fancy. Angry at being thus doubte ...

D:\leuven\1780-1850\ainsworth - windsor castle.txt, Line 2122, N/A:

10. ... ed from the brake. "By my halidom, Surrey, I am grievously disappointed. You [[must]] have mistaken some large stag, caught by its antlers in the branches of the oa ...

Appendix C

Data: The Corpus of Late Modern English Texts, Part 3 (the CLMET 3)

Sample from the corpus

D:\leuven\1850-1920\abbott - flatland.txt, Line 406, N/A:

1. ... a kind of Invisible Cap. The dangers to which we are exposed from our Women [[must]] now be manifest to the meanest capacity of Spaceland. If even the angle of a ...

D:\leuven\1850-1920\abbott - flatland.txt, Line 417, N/A:

2. ... oman is invisible, or visible only as a dim sub-lustrous point, how difficult [[must]] it be, even for the most cautious, always to avoid collision! Many are the ...

D:\leuven\1850-1920\abbott - flatland.txt, Line 496, N/A:

3. ... hese households enjoy immunity at least from invisible attacks. Not that it [[must]] be for a moment supposed that our Women are destitute of affection. But unfor ...

D:\leuven\1850-1920\abbott - flatland.txt, Line 706, N/A:

4. ... ly than your sense of sight, when unaided by a rule or measure of angles. nor [[must]] I omit to explain that we have great natural helps. It is with us a Law of Na ...

D:\leuven\1850-1920\abbott - flatland.txt, Line 741, N/A:

5. ... f the angles, which are impaired after a few weeks of constant "feeling." Nor [[must]] we forget to add, in enumerating the advantages of the more expensive system, ...

D:\leuven\1850-1920\abbott - flatland.txt, Line 751, N/A:

6. ... this is one of the many cases in which expense is the truest economy. But I [[must]] not allow questions of School Board politics to divert me from my subject. En ...

D:\leuven\1850-1920\abbott - flatland.txt, Line 852, N/A:

7. ... nd shading away into greater dimness towards the extremities C and D. But I [[must]] not give way to the temptation of enlarging on these topics. The meanest mathe ...

D:\leuven\1850-1920\abbott - flatland.txt, Line 952, N/A:

8. ... ar Figure, that is to say of regular construction. By this I mean that a Woman [[must]] not only be a line, but a straight line; that an Artisan or Soldier must have ...

D:\leuven\1850-1920\abbott - flatland.txt, Line 953, N/A:

9. ... Woman must not only be a line, but a straight line; that an Artisan or Soldier [[must]] have two of his sides equal; that Tradesmen must have three sides equal; Lawye ...

D:\leuven\1850-1920\abbott - flatland.txt, Line 954, N/A:

10. ... ; that an Artisan or Soldier must have two of his sides equal; that Tradesmen [[must]] have three sides equal; Lawyers (of which class I am a humble member), four si ...

Appendix D

Data: The Lancaster-Oslo/Bergen Corpus (LOB)

Sample from the corpus

Line 107, N/A:

1. ... ^Senator Robertson's committee has to pass \0Mr. Weaver's A01 105 nomination before it can be considered by the full Senate. A01 106 *<*4Gold-hunting Kennedy shocks \0Dr. \0A*> A01 107 *<*6GERMANY [[MUST]] PAY*> A01 108 *<*4Offer of *+357\0m is too small*> A01 109 |^*6PRESIDENT KENNEDY *4is ready to get tough over West Germany's A01 110 cash offer to help America's balance of payments position. ...

Line 165, N/A:

2. ... tement*- and ended by A01 163 inciting Labour {0M P}s to angry uproar. A01 164 |^One dealt with the human issue behind the Health Service; the A01 165 other tried to show that the balance-sheet [[must]] always come first. A01 166 |^The result of the vote was not in doubt. ^For the Tories were A01 167 massed in answer to their whips to defeat a censure motion on the A01 168 Government for *"und ...

Line 405, N/A:

3. ... hern Rhodesia. A02 160 |^More than 500 people*- 167 of them members of the {0*2UNIP}* A02 161 *0were convicted last month in the Northern Province alone. A02 162 |^*"Against this background [[must]] be taken \0Mr. Kaunda's repeated A02 163 statements that all he is doing is in the name of non-violence,*" A02 164 said Sir Roy. A02 165 |^*"I am now compelled to say that I don't accept his g ...

Line 410, N/A:

4. ... all he is doing is in the name of non-violence,*" A02 164 said Sir Roy. A02 165 |^*"I am now compelled to say that I don't accept his good A02 166 faith.*" A02 167 |^He said \0Mr. Kaunda [[must]] know that his statements had stimulated A02 168 violence, but he had done nothing to stop it. A02 169 |^*"It is true he made a point of again being absent from Northern A02 170 Rhodesia when hi ...

Line 625, N/A:

5. ... nt in A03 140 Canada to the problems of the Atlantic provinces. A03 141 |^However, be this election year or not, \0Mr. Pearson, with his A03 142 party increasingly confident of return to power, [[must]] convey to the A03 143 nation that he has the stamp of a Prime Minister of Canada. A03 144 *<*6BONN DOUBTS ON EUROPEAN SPACE PROJECT*> A03 145 *<\0MR. THORNEYCROFT'S TASK TO REMOVE SCEPTICISM*> A0 ...

Line 769, N/A:

6. ... ts, \0Mr. A04 70 Krushchov yesterday returned to Moscow after his two days of talks A04 71 with President Kennedy, writes Dennis Ogden from Moscow. A04 72 |^The good beginning made at Vienna [[must]] be followed up by new A04 73 efforts for peace, the Soviet Communist Party newspaper Pravda A04 74 declared yesterday. A04 75 |^Events in Vienna *"gave hope to people of goodwill who hate th ...

Line 803, N/A:

7. ... pported the A04 104 establishment of sites in Britain for the training of German troops. A04 105 |^His main theme was that nuclear weapons were necessary to defend A04 106 Britain, that Britain [[must]] depend on Nato and *"the West*" must have A04 107 nuclear weapons so long as the Soviet Union has them. A04 108 |^Addressing the annual congress of the National Union of General A04 109 and Mu ...

Line 803, N/A:

8. ... sites in Britain for the training of German troops. A04 105 |^His main theme was that nuclear weapons were necessary to defend A04 106 Britain, that Britain must depend on Nato and *the West**" [[must]] have A04 107 nuclear weapons so long as the Soviet Union has them. A04 108 |^Addressing the annual congress of the National Union of General A04 109 and Municipal Workers, he said he felt sure ...

Line 821, N/A:

9. ... date and vulnerable and would attract enemy action. A04 123 |^That argument did not apply to the Polaris submarine. ^So long as A04 124 the Soviet Union had nuclear weapons, the West, somewhere, [[must]] have A04 125 them too. A04 126 **[BEGIN INDENTATION**] A04 127 |^It was far better for a weapon used for retaliatory purposes to A04 128 be under the sea rather than on land. ^This was why the ...

Line 871, N/A:

10. ... ggested that the distortion arose from enhanced A04 173 payments agreed at local level. ^Local negotiations and bargaining by A04 174 branch officers and shop stewards had come to stay and some way [[must]] A04 175 be found to integrate and co-ordinate their activities in official A04 176 negotiating machinery. A04 177 |^The General Council of the Trades Union Congress should therefore A04 178 co ...