A Quantitative and Diachronic Research of Root *Must*

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1. Introduction

It was argued in Sanada (2009) that English root modal *must* (hereafter, simply referred to as “root *must*”) has the following three usages: (i) prototypical *must* (where a speaker (S) serves as an imposer (or a source) of an obligation), (ii) invitation *must* (where S serves as an imposer, not obliging but rather inviting someone to do something), and (iii) objective *must* (where not S but a factor external to S serves as an imposer). It was then argued that the first usage of root *must* is the most prototypical of the three usages from the standpoint of Searle’s (1979) speech act theory and Lakoff’s (1987) Idealized Cognitive Model (ICM).

Against this background, this paper attempts to support Sanada’s prototype analysis of root *must*, by showing that prototypical *must* is used more frequently from Early Modern English (EModE: 1501-1700) to Late Modern English (LModE: 1701-1900) to Present-Day English (PDE: 1901-) than the other two usages.

The remainder of this paper is organized as follows. Section 2 briefly discusses the significance of approaches applied in this paper. Section 3 identifies three types of root *must* in Sanada’s (2009) ICM framework. Section 4 observes data of root *must* in PDE, EModE, and LModE. Section 5 contains a conclusion.

2. Approaches of This Research

This section briefly discusses a reason why this paper takes a quantitative approach and a

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* This paper is a largely revised version of the paper read at the 54th Annual Meeting of The English Literary Society of Japan, Hokkaido Branch (October 6, 2008). I am especially grateful to Masuhiro Nomura, Hidemitsu Takahashi, Seiji Ueno, Satoshi Oku, Masakatsu Mizuno, Hideo Ishida, and two anonymous referees for their valuable comments and criticisms. All remaining errors are of course my own.
diachronic approach, with reference to prototype analysis and usage-based model (Langacker 1991, and Hayase and Horita (H&H) 2005).

Generally, what is certified as a prototype (i) reflects the intuition of language users to the greatest degree, (ii) is used most frequently, and (iii) is used historically for a long time (H&H 2005:179). Although this does not mean that a member of a category necessarily satisfies the above three criteria¹, it is true that the more of the criteria a prototype satisfies, the more likely it is to be regarded as a prototype.

Prototypical must has been noted in previous reference grammar books (e.g., Quirk et al. 1985, and Huddleston and Pullum 2002), prior to non-prototypical cases of root must, and thus this means, I suspect, that prototypical must reflects the intuition of language users to the greatest degree (and see section 3 for a summary of an ICM-based analysis of root must). It also should be examined whether prototypical must is used most frequently and is used historically for a long time, and this is why this paper applies a quantitative approach and a diachronic approach to the analysis of the usage of root must.

Before developing the above examination, let me survey in a little more detail the significance of quantitative (or frequency-based) research with particular reference to usage-based model (Langacker 1991).

The essence of the usage-based approach is noted as follows: “Substantial importance is given to the actual use of the linguistic system and a speaker’s knowledge of this use; the grammar is held responsible for a speaker’s knowledge of the full range of linguistic conventions” (Langacker 1991:494). This usage-based orientation of the model makes us take seriously the significance of frequency of actual use (H&H 2005:78, and Bybee 2007). In fact, frequency has been regarded as important for examining the emergence and entrenchment of linguistic knowledge or usages, as seen in the following quote by Bybee (2007:336): “Frequency is not just a result of grammaticization; it is also a primary contributor to the process, an active force in instigating the changes that occur in grammaticization.”²

¹ In fact, in some cases a prototype assumed with the help of native speakers’ intuition is not always used frequently (H&H 2005: Chapter 8).
² See Bybee (2007:339-348) for a case study of English modal can.
3. The Classification of Root Must

3.1. The ICMs of Obligation and of Invitation

This section summarizes Sanada (2009: section 3), who constructed an ICM of Directive Speech Acts (DSAs: Searle 1979), and constructed an ICM of obligation and an ICM of invitation; both of obligation and invitation are subclasses of DSAs and can be expressed by root must.³ In constructing the ICM of DSAs, close attention is paid to the three following criteria, presented in (1) (where S and Y stand for a speaker and an imposee, respectively).⁴

(1) a. Speaker’s want: S’s want or no such want
   b. The benefit of S and Y: S&Y’s “benefit +” or “benefit -”
   c. Power relation between S and Y: S\(\geq\)Y or S\(\leq\)Y

Criterion (1a) considers whether S wants the realization of the act (A) that S directs Y to do.³ If S wants the realization, the variable of (1a) is given the value “S’s want,” and if not, no value will be given here. The latter case not only includes cases in which S does not want A to be realized, but also those in which it does not matter to S whether Y actually does A.

Next, criterion (1b) pays attention to whether or not Y’s doing A after S performs a DSA is regarded (by S) as involving a benefit to S and/or Y.⁶ If it can be said that Y’s doing

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³ The ICMs and criteria in this section are partly based on those proposed by Pérez Hernández and Ruiz de Mendoza (PH&RdM) (2002). For example, among the criteria in (1), S’s want and power relation between S and Y are mentioned also in their analysis of DSAs. The difference is that while they use the notion “cost”, this paper uses the notion “adverse benefit” for the reason noted in footnote 6 below. In addition, PH&RdM (2002:264) propose an “ICM of Orders”, consisting of three criteria (cost-benefit, optionality, and power relation). This is similar to this paper’s ICM of obligation (4), but I suspect that they fail to fully consider why the above three criteria are needed for characterizing the speech act of order. This limitation is not found in the analysis of this paper, thanks to ICMs (2) and (3) to be proposed later in section 3.1.

⁴ Although Y is prototypically served by a hearer (H), the value of Y is not specified as H here. This is because of a preference to extend the traditional definition of DSAs (i.e., S gets H to do a future act (A)) and cover sentences with root must; in many of such sentences, Y is a person other than H.

⁵ Criterion (1a) should be considered as a matter of degree. For example, begging is higher than request in the degree of S’s want (PH&RdM 2002:278).

⁶ The opposing notion of “benefit” is traditionally “cost” (Leech 1983), and not “adverse benefit” (as referred to in this paper). However, this paper adopts “adverse benefit” for this reason. Both “benefit”
A involves a benefit, the three following factors are considered further within (1b): (i) the target of the benefit (i.e., S and/or Y), (ii) whether S and/or Y is benefited or is adversely benefited ("benefit +" in the former case, and "benefit -" in the latter case), and (iii) the reason for such benefit (i.e., by Y doing or not doing A). Among these three factors, the second and third ones have the following relationship, considering our folk knowledge of the reason for making Y do A. S and/or Y will benefit from Y doing A, or conversely, S and/or Y will adversely benefit from Y not doing A. On the other hand, it may be difficult to assume the possibility of S and/or Y benefiting from Y not doing A. Neither is the possibility easy to assume in which S and/or Y will adversely benefit from Y doing A. This is because in the above two cases it is unreasonable to get Y to do A.

Finally, criterion (1c) is elaborated as follows. Before S performs a DSA, S evaluates whether S is more or less powerful than Y (depicted as "S>Y" and "S<Y," respectively). "Power" here includes non-physical (such as psychological and social) as well as physical kind. The power is physical (e.g., if S actually physically forces Y to do something), psychological (e.g., if S gets Y to do something based on Y's sympathy for S), or social (e.g., if S makes Y do something by leveraging the social hierarchy between S and Y).

When we do something, we usually try to succeed in doing it. For the success of performing a DSA, at least the two following ICMs should be considered further. Firstly, the ICM on S's mental attitude in performing a DSA is proposed in (2).

(2) S wants the realization of an action that benefits S and/or Y.

In performing a DSA, S will get Y to do A that satisfies the ICM (2), and therefore this ICM motivates the importance of considering (1a) and (1b) when S performs a DSA. To
put (2) differently, when S knows that A does not meet S's want or does not benefit anybody, S will usually not try to get Y to do A. If we find that S nevertheless tries to get Y to do A, some other reason needs to be sought for that. Note that when S's DSA meets (2), the DSA will involve a high degree of subjectivity (in the sense of Lyons 1977). Namely, in that case, S will highly involve himself/herself in performing the DSA.

Secondly, the ICM on the proper power relationship between S and Y is proposed in (3) below.

(3) When S performs a DSA, S will evaluate the power relationship between S and Y, so as to felicitously perform the DSA.

This ICM motivates the necessity of considering (1c) when S performs a DSA. For example, if S is going to lay an obligation on Y and knows that S is more powerful than Y, S assumes that Y is likely to obey an obligation laid by S. In other words, S is unlikely to expect Y to obey the obligation laid by S if S knows that S is less powerful than Y. On the other hand, in the case of request, S is less likely to expect Y to accommodate S's request because S knows that S is less powerful than Y. In this sense, the ICM (3) considers not only the illocutionary act of DSAs but also perlocutionary acts of DSAs.

To be able to expect Y to obey S's DSA, both (2) and (3) must be considered. This is because, even if S has a mental attitude felicitous for performing obligation (e.g., due to satisfying (2)), S's laying an obligation will not be successful if S is less powerful than Y.

Now, the criteria in (1) will be applied to the characterization of some subclasses of DSAs: the ICM of obligation and the ICM of invitation are constructed below.

(4) The ICM of obligation:

a. S wants the realization of A directed. (S's want)

b. S knows that if Y does A, S and/or Y will be benefited, and that unless Y does A, S and/or Y will be adversely benefited.

(S/Y's benefit +, S/Y's benefit-)

c. S knows that S is more powerful than Y. (S>Y)

In the above ICM, (4a) and (4b) contribute to the high degree of subjectivity in the speech act of obligation. This point is important in the analysis of root must. What should be emphasized regarding (4b) is that obligation involves both benefit and adverse benefit
(by Y doing A and by Y not doing A, respectively) to S and/or Y. 
Next, the ICM of invitation is constructed as in (5).

(5) The ICM of invitation:
   a. S wants the realization of A directed. (S's want)
   b. S knows that A benefits both Y and S. (S&Y's benefit +)
   c. S knows that S is more powerful than Y. (S>Y)

(5b) is due to S's intention to have Y do what is beneficial to S, by proposing to Y what it is beneficial also to Y. (5b) indicates that both S and Y are benefited by Y's doing A, but not that S and/or Y are adversely benefited by Y's not doing A. This is the crucial difference between (4b) and (5b); in the latter, an adverse benefit to S and/or Y is not involved.

3.2. The Classification of Root Must

In the observation of data in this section, data of root must will be classified into "prototypical must," "invitation must," and "objective must." These classifications are based on the meaning of root must (6), the ICM of obligation (4), and the ICM of invitation (5).

(6) <The meaning of root must>

S exerts force on Y in order to actually get Y to realize A.

Based on the above ICMs, the three types of root must are defined as follows: (i) prototypical must has the meaning specified in (6) and fully fitting the ICM of obligation (4), (ii) invitation must has the meaning in (6) and satisfies (4a) and (4c) but deviates from (4b) but rather satisfies (5b), and (iii) objective must has the meaning in (6) and satisfies only (4c). Examples of these three types are shown in (7a)-(7c), respectively.

(7) a. [S is a teacher of the hearer (H)]

You must speak clearly, dear.

[J. K. Rowling, Harry Potter and the Chamber of Secrets]

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7 All types of root must satisfy (4c), so that one referee raised the question on whether the criterion (4c) is necessary. The criterion may be dispensable if we analyze only the usage of root must, but I suspect that it is an open question whether the criterion is dispensable also in the analysis of expressions of obligation other than root must. I thus would like to continue setting (4c) in the ICM of obligation.
b. I haven't seen you for years. Hello, there's Margery — my wife, you know. You must come and meet her.

[A. Christie, "The Blood-Stained Pavement” in The Thirteen Problems]
c. [Both S (Katsumoto) and H (Algren) are samurai. S helped H commit suicide because H was defeated in battle.]

If a samurai is defeated in battle, he must take his own life to spare himself the shame of capture.

[The Last Samurai film script]

Firstly, must in (7a) (prototypical must) has the meaning specified in (6), in that S intends to force Y (in this case, H) to do the action obliged (i.e., to speak clearly). Also, must in (7a) fully fit the ICM of obligation (4). S wants Y to speak clearly, so that S can hear Y better, thereby satisfying (4a). Next, S believes that Y speaking clearly benefits S (which means “S’s benefit +”), and if Y does not do A, Y will be scolded by S (which means “Y’s benefit -”), thereby satisfying (4b). In addition, S, who is Y’s teacher, is more powerful (socially, in this case) than Y, thereby satisfying (4c).

Secondly, must in (7b) (invitation must) has the meaning specified in (6); S is trying to get Y to come and meet S’s wife (because S wants Y to do it) by uttering (7b). Next, S wants Y to come and meet S’s wife, thereby satisfying (4a) (and (5a)), because S may believe that if Y comes and meet S’s wife, S will feel happy. Moreover, S is (probably psychologically) more powerful than Y, thereby satisfying (4c) (and (5c)). However, in invitation as opposed to obligation, S considers the benefit of both Y and S from Y doing A (thereby deviating from (4b) but rather satisfying (5b)), probably because S feels that Y will feel happy if Y comes and meet S’s wife. Also, no adverse benefit is directed toward S or Y by Y not doing A in this case; even if Y does not come and meet S’s wife, neither S nor Y is likely to be benefited adversely.

Finally, must in (7c) (objective must) has the meaning specified in (6), because S tries to get Y to do A. Consider then whether it satisfies (4a)-(4c). S tries to get Y (a samurai, in this case) to take his own life, to spare himself the shame of capture, in the (hypothetical) circumstances in which a samurai is defeated in battle. However, S does not particularly want Y to commit suicide (thereby deviating from (4a)), nor does S consider the suicide as being beneficial to S (thereby deviating from (4b), because Y’s doing A is regarded as not involving a benefit to S or Y), but rather considers it obligatory for S’s friend to commit suicide because he was defeated in battle, so that S agrees with Y doing A. Must in (7c)
does not deviate from (4c). S forces a samurai’s way of thinking in being defeated in battle; a samurai should commit suicide when defeated in battle.

4. Data Analysis
4.1. Data Sources
This section deals with data of root must collected from spoken discourse of PDE, EModE and LModE. Spoken discourse here refers to (i) conversations from novels, film scripts, and plays and (ii) speeches. Examples constructed by the present author, native speakers of English, and the authors of previous studies are not included in the total amount of data collected by the present author. The spoken register is focused on here because it is easy to identify the characters involved in the discourse and therefore the relationship between S and Y as well.

Data in and after EModE was chosen for the following two reasons. Firstly, according to the OED, it is around this EModE period that the present spelling of must was fixed (prior to the period of EModE, various forms of must were used, such as most and moiste). Secondly, according to Ono (1969:132), must originally expressed permission, but it came to express obligation some time between the latter half of the 12th century and the first half of the 13th century. His investigation suggests that the sense of obligation of root must had been established by EModE.

In the sections that follow, it will be shown that prototypical must (exemplified in (7a) above) is used the most frequently from EModE to PDE of all the three types of root must (the other two are “invitation must” and “objective must”, exemplified in (7b) and (7c), respectively).

4.2. Data in Present-Day English
From among spoken texts in PDE, a total of 217 tokens were collected. Among them, 185 tokens (85.3%) are classified as “prototypical must”. Portions of the examples are presented in (8).

(8)  a. [S is giving a speech to the public]
    We must have no violence today, [Forrest Gump film script]

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8 These are approximately equivalent to what Biber et al. (1999) label “conversation” and “fiction,” respectively.
b. [From a speech by George Bush, just before the Iraq War, 2003.]
Saddam Hussein and his sons must leave Iraq within 48 hours.

Firstly, consider (8a). S wants there to be no violence today, so that must in (8a) satisfies (4a). Next, if there is in fact no violence, people will find benefit in that situation (and if Y does not do A, Y will suffer from violence), so must in (8a) satisfies (4b) too. In addition, S is psychologically (and perhaps, socially) more powerful than Y (in this case, the audience of S’s speech), which is why must in (8a) satisfies (4c), too. Next, consider (8b). S wants Y (Hussein and his sons) to leave Iraq (thereby satisfying (4a)), and Y leaving Iraq (i.e., Y obeying S’s obligation) is beneficial to S (but not to Y) for satisfying his own political ambition, and if Y stays in Iraq, Y will be offended by S (thereby satisfying (4b)). As for the power relation involved in (8b), S is (politically and socially) more powerful than Y, and this is why must in (8b) satisfies (4c).

Next, only one token (0.5%) was found of invitation must, as in (7b), repeated below (the explanation of root must in (7b) will not be repeated for space limitation. See section 3.2).

(7) b. I haven’t seen you for years. Hello, there’s Margery — my wife, you know. You must come and meet her.


Finally, 31 tokens (14.3%) were found of objective must. Examples are presented in (9).

(9) a. [S is Hidetoshi Nakata. It refers to Japan and you to Japanese people generically.]
“It’s a vertical society. You must constantly pay respect to the person above you. From the time I was a boy, I didn’t feel like this. I felt a freedom from this.”

[TIME, April 29-May 6, 2002]

b. All able-bodied men must leave the city, go across the river and set up a new line of defence, that’s what it said.

[The Pianist film script]

S in (9a) does not want nor derive benefit from Y (Japanese people) constantly paying respect to the person above them, because S himself says, “From the time I was a boy, I didn’t feel like this.” This is why must in (9a) deviates from (4a) and (4b). Next, S is
(psychologically) more powerful than Y, and this power relationship may enable S to lay an obligation on Y (thereby satisfying (4c)). Similarly, S in (9b) does not want nor derive benefit from Y leaving the city (in (9b)), thereby deviating from (4a) and (4b). S does not lay an obligation on Y by himself/herself, but rather “by proxy” for the government in (9b). As for power relationship involved in (9b), S is psychologically more powerful than Y. This is why (4c) is satisfied in (9b).

This section revealed that the type of root must labeled here as “prototypical must” (as in (8)) is the most frequently used of the three types in PDE. The next two sections examines whether this prototype must is used the most frequently of three cases in EModE and in LModE.

4.3. Data in Early Modern English

There are a total of 278 tokens of root must in EModE. Of these, 212 (76.3%) are classified as prototypical must, as shown in (10).

(10) a. SEBASTIAN

I will be free from thee. What would'st thou now?
If thou dar'st tempt me further, draw thy sword.

SIR TOBY

What, what? Nay, then I must have an ounce or two of this malapert blood from you. [Draws]

[Twelfth Night: 4.1.40-43, prose]

b. [Rosalind (S) and Orlando (Y, and H as well) love each other. Orlando does not realize that the person with whom he is talking is actually Rosalind, who has disguised herself as a man.]

Nay, you must call me Rosalind. Come sister, will you go?

[As You Like It: 3.2.422-423, prose]

First, consider (10a). After the hearer picks a fight with S, S wants to have an ounce or two of the hearer’s blood (thereby satisfying (4a)). Next, if S can really do this, S will feel satisfied (i.e., “S’s benefit +”), and if S cannot, S will be more disgusted (i.e., “S’s benefit -”)

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9 The original texts of Shakespeare’s works are in the Arden edition.
(thereby satisfying (4b)). In addition, S as an imposer is (psychologically) more powerful than S as an imposee (thereby satisfying (4c)). Next, consider (10b). S wants Y (or H, with whom S is in love) to call her Rosalind, and after this happens, S will feel satisfied (i.e., “S’s benefit +”), and if Y does not call S Rosalind, S will be sad about Y not calling S in the way S desires (i.e., “S’s benefit -”). This is why must in (10b) satisfies (4a) and (4b). In addition, S is (psychologically) more powerful than Y (thereby satisfying (4c)).

Next, one token (0.4%) of invitation must was found, and it is presented in (11) below.

(11) BENEDICK I have the toothache.
    PEDRO Draw it.
    BENEDICK Hang it !
    CLAUDIO You must hang it first and draw it afterwards.

    [Much Ado about Nothing: 3.2.20-23, prose]

S in (11) invites Y (H) to hang Y’s head and then extract Y’s bad tooth (the cause of Y’s suffering), as S’s answer to Y’s utterance Hang it. S hopes that Y’s toothache will improve so that S wants Y to hang Y’s head (of course, as a joke) and considers it as beneficial to Y and S (in that S will be satisfied if Y recovers from toothache). Thus, must in (11) satisfies (4a) and (5b), rather than (4b). S is (psychologically) more powerful than Y, thereby satisfying (4c).

Finally, 65 tokens (23.4%) are classified as objective must. Parts of the examples are provided in (12) below.

(12) a. [Hamlet (S) had already been commanded by the King to go to England.]

    HAMLET I must to England, you know that?
    QUEEN GERTRUDE
    Alack,
    I had forgot. 'Tis so concluded on.
    HAMLET There’s letters seal’d, and my two schoolfellows,

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10 Benedick’s utterance Hang it! means “No kidding!” but Claudio takes this utterance literally (albeit as a joke), or to kill Y by hanging.
Whom I will trust as I will adders fang'd?—
They bear the mandate, they must sweep my way
And marshal me to knavery. Let it work;
   [Hamlet: 3.4.202-207, verse]

b. [The Prince of Arragon (Y, and H as well) wants to get married to Portia (S).
Portia is making the Prince choose the right casket, and if he does so, he will be
able to marry her immediately.]
Behold, there stand the caskets noble prince,
If you choose that wherein I am contain'd
Straight shall our nuptial rites be solemniz'd;
But if you fail, without more speech, my lord,
You must be gone from hence immediately.
   [The Merchant of Venice: 2.9.4-8, verse]

S in (12a) does not particularly want to go to England himself, and so S does not
consider it as particularly beneficial to go to England. This is because S is aware of being
led to mischief by his two schoolfellows by going to England. This is why must in (12a)
deviates from (4a) and (4b). S lays an obligation on himself by proxy for the King. In
addition, S as an imposer is psychologically more powerful than S as an imposee (probably
because, although S does not want to go to England, S considers it necessary to obey the
King's order), so that must in (12a) satisfies (4c).

Next, S in (12b) lays an obligation on Y (H) based on the rule of choosing caskets in
order to determine whether Y can get married to S. In other words, the obligation in (12b)
is not based on S's desire for Y to go immediately from S, and so S does not benefit from Y
going. Thus, must in (12b) deviates from (4a) and (4b), and S lays an obligation on Y by
proxy for the rule of choosing caskets. Next, S is more powerful than Y in the sense that S
is in a position to tell Y to leave if Y chooses the wrong casket, based on the rule of
choosing caskets. This is why must in (12b) satisfies (4c).

The above observation shows that the most frequently used type of root must in EModE
is prototypical must, as in (10).

4.4. Data in Late Modern English

A total of 89 tokens of root must in LModE were collected from among spoken texts, of
which 60 (69.4%) are classified as prototypical must, as exemplified in (13) below.
(13) a. [S is the Spanish governor and Hs (and Ys as well) are two honest Englishmen. S is worried that the Ys are about to starve.]

"Hold; you must reflect that it will be long ere they can raise corn and cattle of their own, and they must not starve; we must therefore allow them provisions."

[D. Defoe, The Further Adventure of Robinson Crusoe]

b. [S is being asked to donate money to the poor, but he is so miserly that he does not want to do it.]

I help to support the establishments I have mentioned—they cost enough; and those who are badly off must go there.

[C. Dickens, A Christmas Carol]

S in (13a) wants Y to obey S’s obligation (thereby satisfying (4a)), and considers it beneficial to S (i.e., “S’s benefit +”) and if Y does not obey S’s obligation, S thinks that Y may starve (i.e., “Y’s benefit -”) (thereby satisfying (4b)), because S is in the position of governing Y and is socially superior to Y (thereby satisfying (4c)). If Y obeys S’s obligation and reflects what S told Y, the satisfaction will lead to S saving face (this is S’s benefit).

Similarly, S in (13b) is so miserly that S does not want to donate to the poor (Y), but rather wants them to go to the poorhouse (thereby satisfying (4a)). Also, S considers it beneficial for S that Y goes to the poorhouse so that S can avoid donating money to Y (i.e., “S’s benefit +”), and if Y does not do A, S will be annoyed at Y because S does not want to donate money to Y (i.e., “S’s benefit -”) (thereby satisfying (4b)). In addition, S, who is rich, is financially more powerful than Y (thereby satisfying (4c)).

Next, only two tokens (2.2%) can be classified as invitation must. Consider (14).

(14) a. [A child (Y as well as H) is trying to carry a turkey that is so heavy that Y cannot carry it by himself. S says the following while celebrating Christmas and chuckling.]

"Why, it’s impossible to carry that to Camden Town," said Scrooge. "You must have a cab."

[C. Dickens, A Christmas Carol]

b. [S and Y (H, in this case) are friends. Y visits S’s house.]

It was very sweet of you to come. Now, you must have some wine and water, and sit here comfortably and tell us all about it.
In (14a), S wants Y to have a cab (thereby satisfying (4a)) because S knows that the cab will help Y carry a turkey more easily (thereby bringing about Y’s benefit, and also S’s benefit in the sense that S is satisfied that Y can lighten Y’s burden). In this sense, must in (14a) deviates from (4b) but rather satisfies (5b). In addition, S is (psychologically and socially) more powerful than Y (thereby satisfying (4c)), because S is an adult while Y is a child. Similarly, in (14b) S wants Y to have some wine and water, etc. (thereby satisfying (4a)), because S knows that if Y does so, Y will feel at ease at S’s house (hence “Y’s benefit +”), and also that S will probably benefit because S will be satisfied to find Y feeling at ease. In addition, S may not be willing to imply that Y will have adverse benefit by Y’s not doing A. In this sense, must in (14b) deviates from (4b) but satisfies (5b). In addition, S is more powerful than Y here, because S is in the position of inviting Y to S’s house (thereby satisfying (4c)).

Finally, 27 tokens (30.3%) are classified as objective must, as in (15).

(15) a. For example, if my neighbour has a mind to my cow, he has a lawyer to prove that he ought to have my cow from me. I must then hire another to defend my right, it being against all rules of law that any man should be allowed to speak for himself.

[J. Swift, Gulliver’s Travels]

b. “I wish you would explain yourself; I cannot imagine what reason I have to be afraid of any of the company’s ships, or Dutch ships. I am no interloper. What can they have to say to me?”—“Well, sir,” says he, with a smile, “if you think yourself secure, you must take your chance;”

[D. Defoe, The Further Adventure of Robinson Crusoe]

S in (15a), Gulliver, must hire a lawyer in order to save his cow from his neighbor, and therefore without such an interruption S does not want to hire a lawyer (thereby deviating

\[11\] One referee pointed out that (14a) may not express invitation but rather obligation, because Y’s not doing A in this case will involve adverse benefit to Y. Nevertheless, I would like to argue that this case expresses invitation rather than obligation, because S is happy during Christmas and might not be willing to imply adverse benefit to Y by Y’s not doing A.
from (4a)). Next, S does not want to hire a lawyer (if possible, because hiring a lawyer in circumstances like those in (15a) means the situation is undesirable for S), so S does not consider that hiring a lawyer would be beneficial to S (thereby also deviating from (4b)). As for the power relationship, S serving as an imposer is psychologically more powerful than S serving as Y (thereby satisfying (4c)).

Next, the second speaker in (16b) (S in this case) really does not want the first speaker (Y in this case) to do A, or to take Y's chance and fight with enemies (thereby deviating from (4a)) and will not benefit from Y doing A (thereby deviating from (4b)). In this case, S is laying an obligation on Y by proxy for Y (in this case, Y's strong will). Next, S is more powerful than Y (thereby satisfying (4c)).

The observation so far shows that prototypical must is the most frequently used type in LModE, as illustrated in (13).

<table>
<thead>
<tr>
<th>Period</th>
<th>Type</th>
<th>Prototypical must</th>
<th>Invitation must</th>
<th>Objective must</th>
</tr>
</thead>
<tbody>
<tr>
<td>EModE</td>
<td>212</td>
<td>76.3%</td>
<td>1</td>
<td>65</td>
</tr>
<tr>
<td>LModE</td>
<td>60</td>
<td>67.4%</td>
<td>2</td>
<td>27</td>
</tr>
<tr>
<td>PDE</td>
<td>185</td>
<td>85.3%</td>
<td>1</td>
<td>31</td>
</tr>
<tr>
<td>(Total)</td>
<td>457</td>
<td>78.1%</td>
<td>4</td>
<td>124</td>
</tr>
</tbody>
</table>

Table 1. Frequency of use of three types of root must from EModE to PDE.

4.5. Discussion

The result of data observation in terms of three-way classification based on the ICM of obligation is summarized in Table 1.

The table shows that in each of the three periods of English, prototypical must is the most frequently used of the three types. That is, the study's ICM-based account of the

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12 It may be said that S's benefit is involved in (15a) (thereby satisfying (4b)). However, recall the ICM proposed in (2). This ICM is presupposed in this study's analysis of root must, and then the contraposition of the ICM is also the case (i.e., if S does not want the realization of A, the action as an obligation does not benefit S). Therefore, (15a) is not considered to benefit S, who wants to avoid hiring a lawyer if possible.
prototype effect of root must is proven to be quantitatively corroborated.

Remember here three criteria by which a member of a category is certified as a prototype of the category (H&H 2005:179): (i) it reflects the intuition of language users to the greatest degree, (ii) it is used most frequently, and (iii) it is used historically for a long time. The quantitative research developed in section 4 showed that prototypical root must meets the second criterion on frequency of use, because prototypical must is used more frequently than the other two non-prototypical cases of must. Prototypical must also meets the third criterion on historically frequent use, because the research for this study has shown that prototypical must has been used more frequently than the other two non-prototypical cases of must from EModE to PDE.

5. Conclusion

This paper conducted a quantitative and diachronic research of root must. It was shown that prototypical must is used more frequently than non-prototypical must. That frequent use was found not only in PDE but also in EModE and in LModE. This serves as diachronic evidence supporting the prototypicality of root must.

References


A Quantitative and Diachronic Research of Root Must

Grammar of the English Language. London: Longman.