The Statistics of Obsolescence:

Purpose Subordinators in Late Modern English

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The Statistics of Obsolescence:
Purpose Subordinators in Late Modern English

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To Łukasz Rudnicki

Preface

The present book is about *grammatical obsolescence*, a notion not established in linguistics yet, accounting for a situation in which a productive grammatical construction starts to display a decrease in the frequency of use that follows until the construction disappears or there are only fossilised or residual constructions left. In the research literature, phenomena which might instantiate obsolescence are referred to as e.g. *loss*, *decline*, *demise* or *death*. The process of obsolescence itself has an opinion of being, to a large extent, under-researched, contrary to processes of emergence and innovation in language. The main aim of this book is to, at least partly, close this gap by offering a comprehensive study addressing obsolescence from both a theoretical and a practical perspective.

The structure of this book matches its main aim and has different, but interrelated, theoretical and practical components. There is a theoretical part in the beginning (Chapters 1–3), a practical part in the middle (Chapters 4–8), and, again, a theoretical part putting the results of the practical part together with their implications and presenting the conclusions (Chapter 9). This design makes it possible to read the book not only from the beginning to the end, but also to focus on the theoretical side, and go from Chapters 1–3 straight to Chapter 9. The practical parts can be accessed at any time if need be. Additionally, there are many references to particular studies, tables and figures from other chapters throughout the text, so one can always check for the details on methodology and data.

Speaking of methodology, the present work applies various concepts from the fields of corpus linguistics and statistics. Even though a lot of the methodological details and technical intricacies might be judged as redundant or even slightly boring by an expert in a given field reading this book, the presence of these details is necessary due to the fact that also non-experts might be looking at it. Also, as it actually is a PhD dissertation, there are no strict limits concerning the size of this work, contrary to what the situation looks like with regard to articles in peer-reviewed journals and chapters in collective volumes.

Nevertheless, it is hoped that the next 226 pages revolving around grammatical obsolescence, and its possible subtypes, symptoms and causes, prove to be an engaging (if not captivating) piece of scientific prose.

Contents

1. Grammatical obsolescence – theoretical considerations

Well begun is half done

Obsolescence, a relatively rare word itself (highest frequency per million words in the Corpus of Historical American English[1] is 1.51), can be, according to Oxford English Dictionary (OED), used to describe the process or fact of something becoming obsolete, outdated or no longer used. Below, there are three different definitions of the word "obsolescence" from the OED Online[2]:

1.

a. The process or fact of becoming obsolete or outdated, or of falling into disuse.
b. Spec. The process whereby or state at which machinery, consumer goods, etc., become obsolete as a result of technological advances, changes in demand, etc.

2. Biol. and Med. The gradual disappearance or atrophy of an organ or part; persistence of an organ, tissue, etc., without function or activity; (also) spec. the penultimate stage in the evolutionary loss of a character, or in the extinction of a species.

A quick look into the Corpus of Historical American English (COHA) reveals that nowadays the word *obsolescence* is most commonly used in the context 1.b., which in the literature is also referred to as *technical obsolescence*. According to Bao (2009: 296) *technical obsolescence* is to be understood as a situation in which a technical product or service is no longer being made or supported by the producer even though it could still be fully functional and there are people using it. One of the examples is the operating system Windows XP, which, as of April 2014, is no longer supported by its producer Microsoft. Out of sixteen instances of the word "obsolescence" in the decade 2000-2009 in COHA[3], ten were used in this context.

[1] The Corpus of Historical American English (COHA) is the largest diachronic multi-genre corpus of the English language. COHA contains 400 million words of text from the time period 1810-2009. Available online at http://corpus.byu.edu/coha/.
[2] OED Online, s.v. *obsolescence*, retrieved on April 19, 2016 from http://www.oed.com.
[3] Accessed September 27, 2017 via http://corpus.byu.edu/coha/old.

Another context in which the word *obsolescence* is used nowadays is the so-called *planned* or *built-in obsolescence* which can be understood as a policy of deliberately designing products which are *planned* to become obsolete or non-functional after a certain, generally not very long, period of time. *Planned obsolescence* obviously has potential economic benefits for the producer (e.g. Slade 2006: 67; Bao 2009: 296), since the consumers are "forced" to buy another generation of a given product.

Furthermore, the word *obsolescence* is also used in linguistics, above all with regard to endangered languages and language death (e.g. Dorian 1981; Jones 1998). Jones (1998: 4-5) defines *language obsolescence* as "a process whereby a language is ousted from its territory by another variety". The end-point of *language obsolescence* is language death. The rapidity of this process varies greatly from 2-3 generations (Jones 1998: 5) to a few hundred years (Schmidt 1985: 4). According to Jones (1998: 6), it should, however, not be assumed that every case of *language obsolescence* will end in the extinction of a language, since "[t]he process may be halted and revitalization may occur".

Another linguistic, but a much narrower context for the word *obsolescence* is provided by *lexical obsolescence*, a process happening also in languages which are far from being endangered, such as e.g. English. Tichý (2018) deals with the topic of lexical mortality, which he interchangeably terms *lexical loss* and *lexical obsolescence*, in the time period of 1700-2000. The main aim of his paper is to present a new methodology for the extraction of forms which used to be common, but are now lost. In his work, Tichý refers to the topic of *lexical obsolescence* as relatively under-researched (2018: 81).

The same seems to be true for yet another context in which the word *obsolescence* is sometimes used, namely *grammatical obsolescence*, to the investigation of which the present work is devoted. There are only few works which focus entirely on how and why grammatical items leave the core grammar of a given language (e.g. Ashby 1981; Petré 2012; Hundt & Leech 2012). The "negative end" of change in the realm of grammar is, in comparison to the phenomenon of emergence, a territory largely uncharted. As Hundt states (2014: 166):

> The emergence of syntactic constructions has been studied in great detail, most notably within the framework of grammaticalisation. Syntactic loss, on the other hand, has received barely any attention.

The main motivation behind the investigation of *grammatical obsolescence* is to close this gap by offering a systematic and comprehensive study of previously productive grammatical items disappearing from the language, which addresses the problem from both a theoretical and a practical perspective.

1.1 Structure of the present work

The present work has two main components, a theoretical and a practical one, which serve one common aim, namely to offer a comprehensive study of grammatical obsolescence. The first component is focused around the development of a theoretical approach to the phenomenon of loss in grammar. Since *grammatical obsolescence* is not yet an established notion in linguistics, the present work aims at describing and situating phenomena instantiating it, such as loss and decline of grammatical constructions, among major processes of language change. Chapter 1 deals with theoretical considerations on *grammatical obsolescence*, its definition, instantiations in the literature and links to major processes of language change. Chapter 2 is focused around the development of *criteria catalogue* for the investigation of *grammatical obsolescence*, a collection of methods, ways and means to investigate potentially obsolescent constructions. It constitutes a direct preparation for the empirical part. Chapter 3 introduces the case study variable – the network of English purpose subordinators and presents the historical background for each of the studied constructions.

The main aim of the second, empirical, component is to complement the theoretical approach with insights from a case study of *grammatical obsolescence* in progress. The constructional network containing potentially obsolescent constructions is investigated with the use of *criteria catalogue*, developed in Chapter 2. Chapters 4 to 9 show the application of each of the methods from the *criteria catalogue* to the variants of the case study variable. The data come from different corpora of the English language (listed in Chapter 2, Section 2.4). The language variety of choice is American English (for a justification see Chapter 3, Section 3.3). The main time frame for the study is the time period 1810 – 2009. Chapter 9 presents the summary of results, the conclusions, and, once more, addresses the theory behind the notion of *grammatical obsolescence*.

1.2 Refining the concept of grammatical obsolescence

Is *grammatical obsolescence* an unambiguous notion or can the adjective *obsolescent* be, in the discussed context, used interchangeably with *obsolete*, *lost* or *rare*? The present work defines *grammatical obsolescence* as follows:

> *Grammatical obsolescence* describes a situation in which a previously popular and productive construction is, often gradually, losing its productivity and popularity over time until the construction disappears or there are only residues or fossilised forms left. The function of the obsolescent construction may discontinue or continue to be (fully or partially) expressed by alternative means.

This proposed definition does not mention any concrete threshold frequencies for a construction to be "previously popular and productive" or to "lose its productivity and popularity over time", even though they would make the identification of *obsolescent* constructions much easier. One of the goals of the present section is to discuss whether the determination of such threshold frequencies is even possible or whether there are other factors that play an even more important role. But before we move further in this direction, it is necessary to conduct a detailed theoretical discussion of the definition of *grammatical obsolescence* and to differentiate between *obsolescent*, *obsolete* and *rare* constructions. Since the noun *obsolescence* is a not very frequent word itself, the adjectives related to it, namely *obsolescent* and *obsolete*, might cause some confusion, especially when they are encountered for the first time. Thus, the first topic to be discussed in this section is the difference between the general and the linguistic meaning of these adjectives. From now on, whenever we talk about *obsolescence*, it is *grammatical obsolescence* that is meant, unless otherwise specified.

What would be the most intuitive way to use the adjectives *obsolescent*, *obsolete* and *rare* in linguistics? One of the possibilities would be to use them in accordance with their original dictionary meaning, just like David Denison (1998) does in his chapter presenting an overview of research on the topic of syntactic change in Late Modern English. Denison labels certain grammatical patterns, constructions or usages as o*bsolescent* twelve times; *virtually obsolete* is used four times; the term *obsolete* seventeen times. Some of the mentions of constructions that are labelled as *obsolescent* or *obsolete* are based on the OED

(Oxford English Dictionary), which marks the outdated usages or constructions with a cross (†) and an abbreviation *obs*. for *obsolete*[4]. For the purpose of clarity, I list some of Denison's examples of *obsolete, virtually obsolete* and *obsolescent* constructions.

Two examples of *obsolescent* constructions:

1) verbal concord with singular *majority* in phrases like *the majority of students*
2) negative forms of certain modal verbs: *mayn't, usedn't, oughtn't*

Two examples from the *virtually obsolete* class:

1) the directional adverbials *whence* and *whither*
2) inversion triggered by some kinds of initial adverbials *then*, *now* and *thus*

Two examples of *obsolete* constructions:

1) Modal *durst* and its negative form *durs(t)n't*
2) the pattern *every + the + superlative adjective*

Denison's chapter is above all concerned with the Late Modern English period, so it is possible for us to use the modern electronic mega-corpora to see whether there has been an observable process of decline during the period from 1800 to the present and whether we still come across some of the aforementioned constructions.

The first search conducted in the Corpus of Historical American English[5] already reveals that some examples from the *obsolescent* group can still be found in COHA even in the 2000-2009 decade, though the actual frequency per million words is in all cases very low (e.g. 0.3 for *oughtn't*; 0.1 for *mayn't;* less than 0.3 for verbal concord with singular *majority* in phrases like the *majority* of *noun plural*). Among the *virtually obsolete* examples the directional adverbs *whither* and *whence* are also still present in the corpus: between 2000 and 2009 *whither* is used 8 times (0.27 per million words) and *whence* 42 times (1.42 per million words). The *obsolete* modals *durst* and its negative form *durstn't* are marginally present in COHA (*durstn't* is last used in 1849 and its positive stem in the 1950's). The second example from this category, the pattern *every + the + superlative adjective,* is completely absent from COHA.

On the basis of this short overview of Denison's examples we can see that the *obsolete* category corresponds well with the general meaning of the word according to OED Online[6], namely "no longer produced or used; out of date". An *obsolete* construction is thus

[4] *Obs*. stands for *obsolete* according to the list of abbreviations used in the OED Online: http://public.oed.com/how-to-use-the-oed/abbreviations/#o.
[5] Accessed April 25, 2016 via http://corpus.byu.edu/coha.
[6] OED Online, s.v. *obsolete*, retrieved on September 26, 2017 from http://www.oed.com.

a construction which has fallen out of productive use. Considering the fact that we live in the period of Present Day English, and taking into account that "grammatical change unfolds much more slowly than lexical or phonological change" (Mair 2006: 82), we can expect that there will be fewer constructions we can call *obsolete* from Late Modern English or Present Day English than for example from Early Modern English. With cases like modal verb *durst* the situation is pretty straightforward – they are not used by anyone anymore – completely absent from the modern language, except in quotations or as ironical allusions to older usage. Therefore, according to Denison, they are *obsolete*.

Being *obsolete* and disappearing from the active and productive language usage is thus one of the potential final stages of the process of *obsolescence*, according to the definition assumed in this work. But what about the construction to which Denison refers as *obsolescent* and *virtually obsolescent*? Our exploratory corpus consultations revealed the constructions from these groups are still marginally present in COHA. This fact might be enough to not classify them as *obsolete*, but how to tell if they are *obsolescent* or just *rare*?

This work suggests that in a case of an *obsolescent* construction there should be a visible negative correlation between the time and the frequency of use. This would be in accordance with the OED definition mentioned on the first page of the present chapter – there has to be some previous use or popularity for an item to "go out of use". The higher the negative correlation of frequency and time, the less frequently the construction is being used at present, in comparison to the past. Furthermore, in the case of *obsolescence* the frequency of use across time should be showing a clear downward trend (see Fig. 1-1), and not first rise and then decrease just to rise again, which can be termed as *fluctuations* (see Fig. 1-2). *Obsolescence* is to be looked at as a process with a dynamic character, in which the frequency of use visibly decreases with time and does not express many fluctuations. The present work proposes negative correlation between time and the frequency of use as the necessary condition for *obsolescence*.

The fact that obsolescence is a process differentiates *obsolescent* constructions from *rare* ones, since *rareness* is more of a state at a given moment in time that a process. A construction can be at the same time *obsolescent* and *rare*, especially if as a result of obsolescence the frequency of use of a given construction reaches very low values. On the other hand, not all *rare* constructions are at the same time *obsolescent*, because some of them seem to have always been *rare* (Fig. 1-3) and there is no particular negative correlation between time and the frequency of use.

One might, however, approach the problem of differentiation between *obsolescent*, *obsolete* and *rare* from yet a different angle. We previously said that one of the potential end stages of

the process called *obsolescence* is reached when a given construction becomes *obsolete*. But can a given construction become *obsolete* even if it has never been particularly popular and productive? A given construction might have just "always" or for a very long time been *rare* (Fig. 1-3) and then disappear. Such a situation would fit into the description of marginalisation by Hansen (2017) who differentiates between fully-fledged grams resulting from grammaticalisation and elements occupying the periphery of language system, potentially coming from changes such as marginalisation, which, according to Hansen (2017: 264) "might be the precursor of actual retraction".

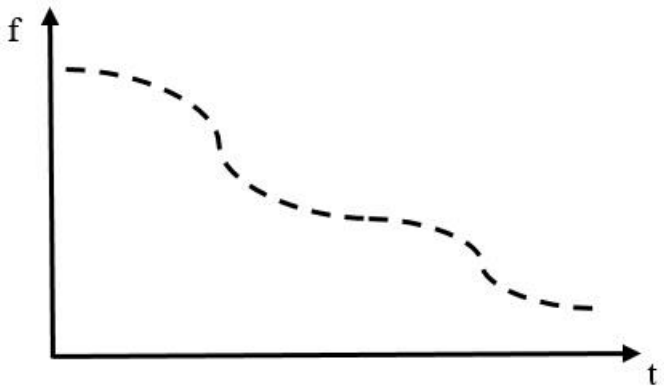


Fig 1-1: A symbolic depiction of *obsolescence*. Frequency of use (f-axis) decreases over time (t-axis).

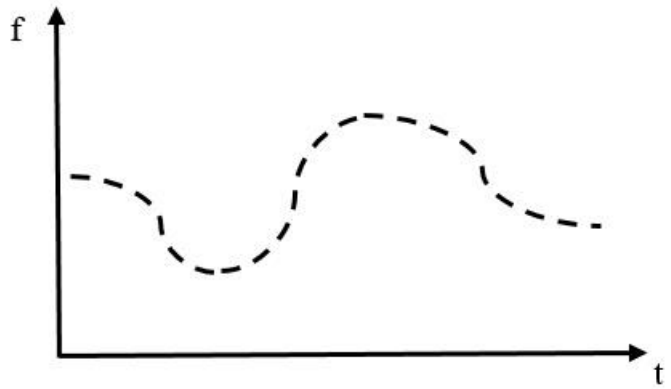


Fig. 1-2: A symbolic depiction of *fluctuations*. Frequency of use (f-axis) decreases and increases interchangeably over time (t-axis).

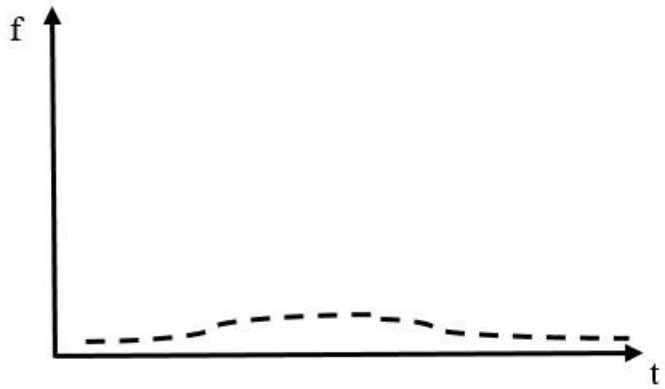


Fig. 1-3: A symbolic depiction of a construction which has "always" been *rare*. Low frequency of use (f-axis) with very little changes over time (t-axis).

One should also bear in mind the differences between spoken and written varieties, as there is a greater chance of coming across outdated constructions in the written language due to e.g. the presence of quotations from older sources or consciously "archaic" or jocular uses, which might result in corpus attestations of constructions which are no longer actively used by the language community.

Also, the very disappearance of a construction does not seem an easy issue to handle in the context of finding a criterion for differentiation between *rare* and *obsolete* as it implies the necessity of e.g. the defining time frames for the disappearance to be "ultimate". Interestingly, the OED Online, which marks some of the outdated usages as *obsolete*, has its own key for using this kind of marking, namely "if the last discovered usage (i.e. quotation) is dated 1929 or earlier, we would label a word or sense as obsolete, unless it occurs in compounds or derivatives dated 1930 or later (when we might add 'now only in compounds' or similar)"[7]. So, the OED Online actually does specify time frames for a usage to be *obsolete*. However, it remains unclear why 1929 is used as a cutting point.

If, as was previously stated, a construction can simultaneously be *obsolescent* and *rare*, can it, at the same time, be *rare* and *obsolete*? Let us consider the following plausible criteria for the differentiation between *rare* and *obsolete*:

a) A marginal or very *rare* construction is *obsolete* if its frequency of use per million words in a language corpus is below a specified universal threshold.

[7] Quotation from an email written by the OED Online Team in response to an email query asking about the key behind the abbreviation *obs.* (sent by the author of this work).

b) A marginal or very *rare* construction is *obsolete* if it is one of the variants of a given variable and as such it covers only a very small (previously specified) share of all the instances of this variable represented by all the variants.
c) A marginal or very *rare* construction is *obsolete* when, although still grammatical according to some language grammars, it is not accepted by the language users (acceptability criterion). The baseline for this acceptance could be e.g. spoken register.

The simplicity offered by proposition a) sounds tempting, however, universal frequency thresholds do not make much sense in the context of grammar, as there is no universal measure classifying constructions as e.g. *frequent*, *relatively frequent*, *infrequent* and *very infrequent*. Also, according to Hundt (2014: 185) corpus linguistics itself cannot help us determine any potential thresholds of this kind:

> One of the questions that corpus evidence on its own cannot answer is what the frequency threshold of a construction is for it to be considered part of the grammar of individuals or of a speech community.

The proposition b) seems to make more sense, because it means that the share taken by the construction in question in its constructional network is negligibly small. Still, to set the percentage threshold properly, one should first investigate a number of constructions that can, later on, serve as model examples. Additionally, the very determination of the number of constructions in a given network which are needed for this approach to be applied might not be possible at all. Even if we selected a general borderline percentage or frequency, we would likely have another problem, namely finding enough constructions that would be adequate to serve as model examples. Also, proposition b) only applies to variants, which are situated within a broader constructional network, so there should be many different variants of the same variable to calculate the appropriate share in question.

Proposition c) fits the original non-linguistic meaning of the words, situates itself well in the usage-based approach and corresponds to the way Denison (1998) uses the word *obsolete* in his overview of research on the topic of syntactic change in Late Modern English. Hundt (2014: 185), in her study investigating the *being to VERB* construction, mentions the possibility of using acceptability ratings in the context of grammaticality

determination of rare examples, stating "[e]licitation experiments (acceptability ratings) might help to answer the question of the 'grammaticality' of rare examples".

Along these lines, the present work uses the criterion of loss of acceptability to differentiate between *rare* and *obsolete* constructions. In the case of *rare* constructions, we see a construction which is occasionally used, but still generally accepted by the language community. In the case of an *obsolete* construction such general and unproblematical acceptance cannot be assumed. So, according to this approach a construction cannot be *obsolete* and *rare* at the same time, as these notions are mutually exclusive. Figures 1-4 and 1-5 contain symbolic depictions of an *obsolescent* construction and of a construction which has "always" been *rare*. The black diamond-shaped points represent random points in time, at which one might check acceptability among language users to determine if the construction is *rare* or *obsolete*. The presence of a continuous frequency curve above the t-axis in both Fig 1-4 and 1-5 implies there still is some usage of the construction in the speech community and the construction is much more likely be assessed as *rare* than *obsolete*. Figure 1-6, on the other hand, presents a construction which is either extremely *rare* or *obsolete* depending on the fact whether the usages are genuine productions of the language user(s) and the criterion of acceptability is fulfilled or whether these usages come from e.g. a quotation from a historical source, in the case of which the acceptability criterion might not be fulfilled. It would also seem to make sense to always specify a certain point or period in time at which a construction is considered as *obsolete*.

The present section aimed at finding a way to differentiate between the notions *obsolescent*, *obsolete* and *rare*, thus providing the under-researched "negative end" of language change with some terminological and conceptual clarity. Starting from the next section, these notions will not be italicised anymore, since, it is hoped, their meaning in the domain of loss in grammar, proposed by the present work, has been explained in an adequate way.

To sum up, even though the words *obsolescent*, *obsolete* and *rare* have different meanings, one thing is common for all of them, namely none of these will be used in a description of a construction widely used. They all characterise grammatical items occupying the lower range of the frequency scale.

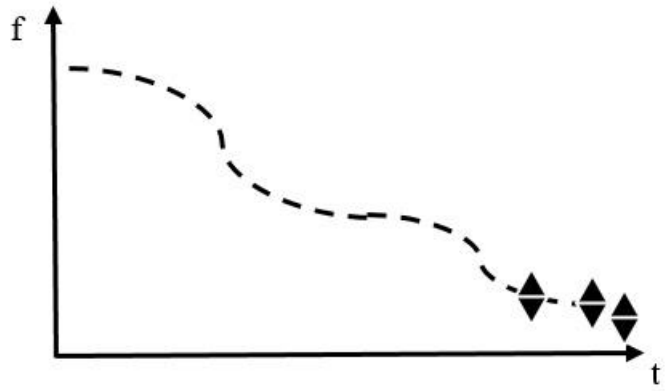


Fig. 1-4: A symbolic depiction of an *obsolescent* construction with random points in time at which one might conduct acceptability ratings to check acceptability of the construction.

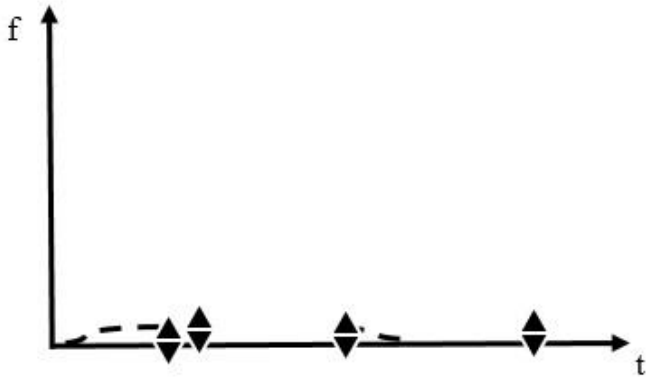


Fig. 1-5: A symbolic depiction of a construction which has "always" been *rare* with random points in time at which one might conduct acceptability ratings to check acceptability of the construction.

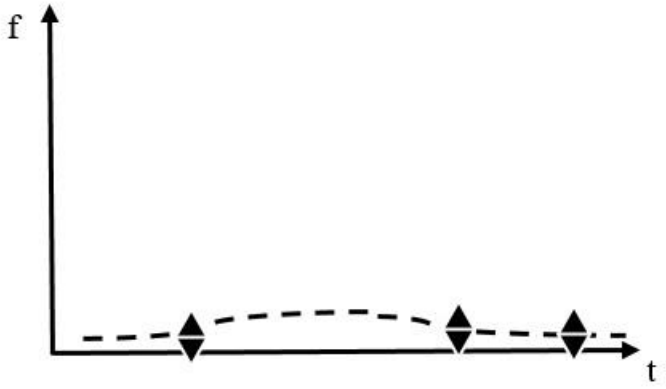


Fig. 1-6: A symbolic depiction of a construction which is either very *rare* or *obsolete* with random points in time at which one might conduct acceptability ratings to check acceptability of the construction.

1.3 An overview of research on grammatical obsolescence

Obsolescence of previously popular and productive constructional patterns is a phenomenon that has not been studied in a comprehensive and systematic way. The demise, loss and drop in the frequency of certain grammatical items, which all might be instantiations of grammatical obsolescence, were, most of the time, mentioned in a slightly anecdotal way or as a short addition to works focusing on different topics, as in e.g. Barber (1964: 130-131) and Mair (2006: 141) in the discussion of the restricted use of *whom* in contemporary English. Another example is the work of Lorenz (2013: 125-126), who, focusing on the rise of contracted semi-modals, also notes the accompanying decrease in the frequency of use of certain core modals, such as *must*.

There are only few studies which put their main emphasis on grammatical items that fall into disuse. Ashby (1981) describes the loss of the negative morpheme *ne* in Parisian French. Hiltunen, who analyses Old and Early Middle English texts (1983), investigates the decline of prefixes and the beginning of the phrasal verb. Petré (2010) deals with the loss of *weorðan* in the past tense in Old and Middle English. Among more recent works one should mention Hundt and Leech (2012), who study the decline of the relativiser *which* and the conjunction *for*, Hilpert (2012), whose work focuses on the decline of *many a NOUN* construction, and Hundt (2014), who describes the demise of the *being to VERB* construction. A slightly different approach to a construction in demise is taken by Kastronic & Poplack (2014), who deal with the question whether we can talk about the revival of English mandative subjunctive.

The present section describes all the studies just mentioned. Methodology is used as the primary criterion for the identification of similarities and differences between particular works. The purpose of this is to present the whole variety of methods, data sources (different corpora, different languages and language varieties) and, later on, to justify the choice of research approach and methodology for the present dissertation.

The majority of the above-mentioned scholars approach the topic of obsolescence with tools and methods of corpus linguistics. The corpora which have been used vary from big mega-corpora like Corpus of Historical American English and Corpus of Contemporary

American English[8] (Hilpert 2012; partly Hundt 2014) to smaller corpora (Ashby 1981; Petré 2010; Hundt
& Leech 2012; Hundt 2014; Kastronic and Poplack 2014) like the Brown family of corpora[9], Malecot's Paris Corpus, ARCHER[10] and many more. Some of the works feature the use of multiple corpora to offer a better insight into the diachronic developments of the studied phenomena (Hundt & Leech 2012; Kastronic & Poplack 2014) or because the investigated construction is so rare that a single corpus (even a mega-corpus such as COHA) does not yield enough cases for the purpose of the analysis (Hundt 2014).

Two works deal with spoken language, namely spoken French and (North) American English. Ashby (1981), who looks into *ne*-deletion in spoken Parisian French (Malecot's Paris Corpus) is, above all, interested in the complexity of variables which affect the process of the propagation of structural change. On the one hand, he claims the eventual loss of *ne* seems probable, but, on the other hand, he identifies various syntactic, phonetic and stylistic contexts which favour its retention. The work offers no diachronic account of the change. The second study, done by Kastronic & Poplack (2014), aims to show that the widely assumed revival of mandative subjunctive in American English is a myth; the corpora used in the study are Corpus of English Dialogues (CED), Quebec English Corpus (QUEC) and the sections of ARCHER, which are most similar to spoken language: letters, journals, diaries. Kastronic & Poplack take a variationist and comparative perspective and approach the research question taking into account mandative triggers, as the subjunctive variant is only admissible under specific subjunctive triggers when these occur in subjunctive-selecting context. The work offers a synchronic and diachronic account of the studied variant and presents findings showing that – contrary to widespread claims in the research literature – the subjunctive has never been common in (North) American English and remains practically absent from informal speech.

[8] The Corpus of Contemporary American English (COCA) is the largest freely-available corpus of English. COCA contains more than 520 million words of text. Website: http://corpus.byu.edu/coca/.

[9] The Brown family of corpora consists of several corpora designed on the basis of the original Brown Corpus (The Standard Corpus of Present-Day Edited American). The core corpora are Brown (written American English, 1961), LOB (Lancaster-Oslo-Bergen Corpus, written British English, 1961), Frown (Freiburg Brown Corpus, written American English, 1992), and FLOB (Freiburg Lancaster-Oslo-Bergen Corpus, written British English, 1991). Each corpus contains approximately 1 million words sampled from 15 text categories.

[10] A Representative Corpus of Historical English Registers (ARCHER) is a multi-genre historical corpus of British and American English covering the period 1600–1999.

Petré (2010), on the basis of the data extracted from a corpus prepared especially for his research, conducts a collexeme analysis and compares the strength of association between the category of time adverbials and one of the copulas – *weorð* and *wæs*. The work accounts for the loss of *weorð,* and goes far beyond simply positing loss through competition with a more frequent variant – *wæs*, as there is quantitative evidence to support a hypothesis that it was the breakdown of the bounded system of Old English which was instrumental in the disappearance of *weorð.*

Similarly, not only concentrating on competition, Hundt (2014) points to paradigmatic attrition and distributional fragmentation as two phenomena accompanying the demise of the *being to VERB* construction. The construction she is dealing with is, and has always been, a rare one, so in order to collect data a "grab-any-source-you-can" approach had to be adopted (apart from different historical corpora and electronic sources such as Early English Books Online[11], Hundt searches for relevant citations in the OED online). Her explanation for the obsolescence of the *being to VERB* construction is a weak version of system dependency, which would allow for occasional use of the "dead" construction well beyond the period when it should, in theory, have become ungrammatical (Hundt 2014: 185).

Hilpert (2012) uses collostructional analysis to study the *many a* NOUN construction, a construction decreasing in the frequency of use and deviating from the canonical noun phrase pattern. His findings suggest that the *many a* NOUN construction has always been a rather peripheral and stylistically marked choice for language users. The work gives a detailed account of the advantages offered by the application of collostructional analysis (Stefanowitsch & Gries 2003, 2004) to the study of language change. Apart from collostructional analysis, Hilpert (2012) uses variability-based neighbour clustering (VNC) as a tool for the identification of stages in diachronic data (Gries & Hilpert 2008). This bottom-up and data-driven clustering method puts together and merges cohesive groups of data-points, at the same time keeping them in chronological order, which allows for the identification of diachronic stages for each construction individually. However, the VNC, by its nature, needs a lot of adjacent data points, so the soundest way to apply it is to use data from mega-corpora.

[11] Early English Books Online (EEBO) is a digitalised collection of early printed works in English. The database includes more than 125 000 works mostly printed between 1473 and 1700.

A more "traditional" approach to diachronic language study would be to take a few equidistant periods of language history and compare them with each other. This approach is taken by Hundt & Leech (2012) in their study of the decline of *which* as a relativiser and *for* as a conjunction. In their work they use the BROWN family of corpora, which enables them to have a look at three equidistant periods in the history of American and British English. Their approach is less data-driven than the VNC method, but the data points are argued to be chosen wisely, since 30 years approximately mean a generation of speakers (Leech et al. 2009: 27; Hundt & Leech 2012: 180). With regard to methodology, the paper emphasises some advantages of the use of smaller, but well-balanced corpora over the use of big mega-corpora, i.e.: careful sampling of data constituting the corpus, accurate tagging, exhaustive scrutiny and whole-text access. Hundt and Leech's findings support the view that the decline of *which* as a relativiser and *for* as a conjunction can be associated with the rise in frequency of competing items (2012: 183, 186).

What are the possible causes of obsolescence identified in the abovementioned studies? According to one of the works it might have been competition (Hundt & Leech 2012), whereas others explain it by system dependency (Hiltunen 1983; Petré 2010; Hundt 2014). Additionally, two authors aim at explaining why an obsolescent construction remained in the language after becoming very rare and is still occasionally used (Hilpert 2012; Hundt 2014). Table 1-2 presents a short overview of works discussed in the present section.

Author	**Language investigated**	**Construction investigated**	**Sources used**	**Methods applied**
Ashby (1981)	(spoken) Parisian French	the negative morpheme *ne*	Malecot's Paris Corpus	corpus analysis
Hiltunen (1983)	Old and Early Middle English	prefixes	Old and Early Middle English texts	corpus analysis
Petré (2010)	Old and Middle English	*weorðan* in the past tense	all-genre corpus set out in Petré & Cuyckens (2008)	corpus analysis, collexeme analysis
Hundt and Leech (2012)	English	the relativiser *which* and the conjunction *for*	BROWN family of corpora	corpus analysis

Hilpert (2012)	English	*many a NOUN* construction	COHA	corpus analysis, collostructional analysis, variability-based neighbour clustering (VNC)
Hundt (2014)	English	*being to VERB* construction	a "grab-any-source-you-can" approach (historical corpora and databases such as EEBO, OED online)	corpus analysis
Kastronic and Poplack (2014)	(spoken) North American English	English mandative subjunctive	Corpus of English Dialogues (CED), Quebec English Corpus (QUEC), ARCHER	corpus analysis

Table 1-2: Works dealing with syntactic loss described in Section 1.3 – a sum-up.

1.4 Subtypes of grammatical obsolescence

The cases of syntactic decline investigated by works in Section 1.3 are clearly not homogenous. As could be seen, there seem to be, at least to some extent, different signs, causes or outcomes of the process in almost each of the described cases. At this point I would like to propose that there may be different subtypes of obsolescence depending on the causes and outcomes of the process.

The most intuitive cause for something to disappear from the language is competition and replacement, a scenario in which one construction is being pushed out from the language by another functionally equivalent one. This kind of obsolescence can be viewed as obsolescence of form only. But, as some of the works discussed in Section 1.3 show, competition on the constructional level is not always the only cause of obsolescence. Another scenario is obsolescence caused by higher-order processes, also referred to as system dependency, in the language system. Depending on a particular case, obsolescence caused by system dependency might instantiate obsolescence of form and function or of

form only. Fig. 1-7 presents a schematic representation of a situation in which a construction seems to be disappearing from the core grammar. Subtype 1, presented in Fig. 1-7, can be summed up as obsolescence of form (no formal need anymore) and/ or function (no functional/ communicative need anymore). An example is the loss of noun gender in the transition from late Old English to Middle English.

Subtype 2 is a "competition and replacement" situation. There is obsolescence of form, but continuation of function through direct replacement. One example is the loss of *be*-perfect and generalisation of *have*-perfect:

The king ***is*** *gone –> The king* ***has*** *gone* (gone preserved as fossilised participial adjective.

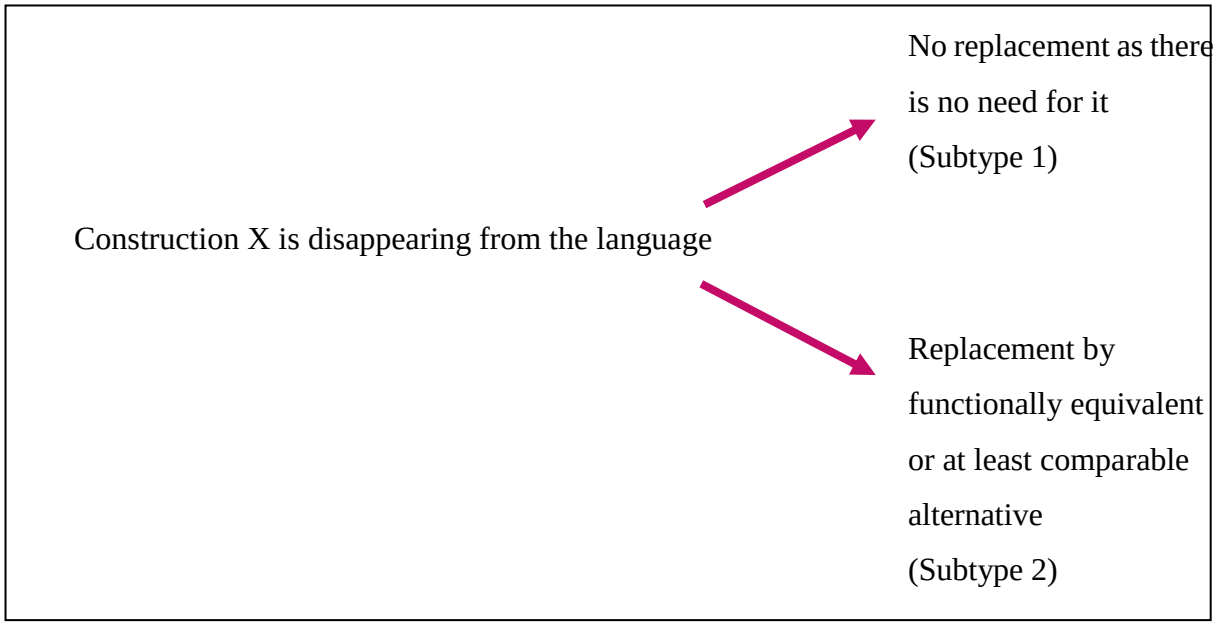


Fig. 1-7: Two basic subtypes of obsolescence.

In their "pure" form the two abovementioned scenarios can be expected to be extremely rare. Most cases of obsolescence seem to be somewhere between the lack of functional or communicative need (obsolescence of function) and the lack of formal need (obsolescence of form). Since an integral part of the present work is a case study of obsolescence in progress, it cannot be ruled out that more subtypes of obsolescence will later be identified. What is, however, still missing in the section describing and gathering

findings from literature on obsolescence are the links to prominent processes of language change.

1.5 Obsolescence among processes of language change

Usage-based approaches – from grammaticalisation theory (Hopper & Traugott 2003) to corpus-informed historical construction grammar (Hilpert 2013) – have generally tended to focus on the emergence of grammar and new grammatical constructions. As Hundt and Leech state (2012: 175):

> The study of declining features of language has been much neglected in the recent years, since prominent processes of language change such as grammaticalization typically place the emphasis on features that are on the rise.

According to Givon's (1979: 209) life cycle of grammaticalisation, the disappearance of grammatical marking might be the ultimate stage in diachronic development and thus the result of maximum regularity and high frequency of use. Dahl (2000: 115) exemplifies this using a wholly unmarked possessive construction in Old French, where Latin genitive marking has been reduced to zero:

La bouche sa mere
'his mother's mouth'
(Herslund 1980: 126)

This is, however, something different from grammatical obsolescence as it assumes there was maximum regularity and high frequency of use. No downward diachronic changes in the frequency of use, which are essential in the case of obsolescence, are mentioned and observed.

Hopper & Traugott (2003: 172) state that "at the extreme end of the history of a particular form as a grammatical marker we might find loss, either of form alone or occasionally of both form and function". The loss of form alone is associated with competition – a situation in which two or more competing forms exist for the same function, and one is eventually selected at the expense of the others. Hopper & Traugott also claim that the whole inflectional paradigms can pass out of general use and give an example of

the German *Imperfekt*, which is said to be quickly decreasing in the frequency of use. One of the observations they make is that the older paradigm remains in written and formal registers, but is essentially dead in the colloquial registers. In such cases, they claim, "renewal" (replacement of a dying form by a newer, usually periphrastic one, with a similar meaning) is common. They, however, do not specify when and how the dying form is going to finally disappear and whether it will leave something behind or just die out completely. There are no reasons given as for why "the whole paradigm can pass out of general use". No name is suggested for this phenomenon and process.

On the other hand, Figure 1-8 shows a prototypical case of expansion in grammaticalisation, as presented by Haspelmath (2004). As the item denoted as A_1 forms a grammaticalisation chain, it is typical that some of its earlier manifestations are lost "so the chain loses on the left what it gains on the right" (Haspelmath 2004: 33). However, there is no fixed point at which the disappearance of earlier manifestation has to happen, as it does not have to happen at all and in many cases the outgoing and incoming versions coexist (Hopper 1991; Hopper & Traugott 2003; Haspelmath 2004; Mair 2017). In Fig. 1-8 the coexisting versions at stage 4 are A_2, A_3 and A_4. In the terminology of Hopper (1991) it is called *layering*. To account for the fact that it is not always the oldest manifestation of a grammaticalised item that is leaving the language system, Haspelmath (2004: 33-34) presents retraction (Fig. 1-9) and antigrammaticalisation (Fig. 1-10). In retraction, which is described as opposite to expansion (Fig. 1-8), some of the newer versions (on the right, like B_4) are lost. The difference between retraction and antigrammaticalisation lies in the fact that in retraction the chain does not expand to the left (as it happens in stage 5 and 6 in Fig. 1-10). According to Haspelmath (2004: 33) "[e]verything in language can become obsolete, independently of its degree of grammaticalization".

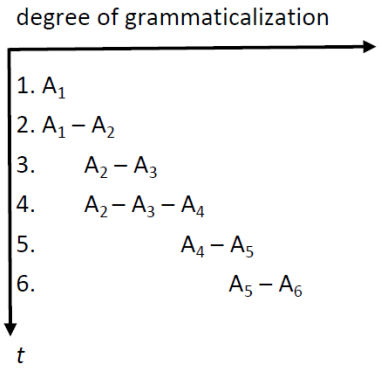


Fig. 1-8: Expansion in grammaticalisation (Haspelmath 2004: 33).

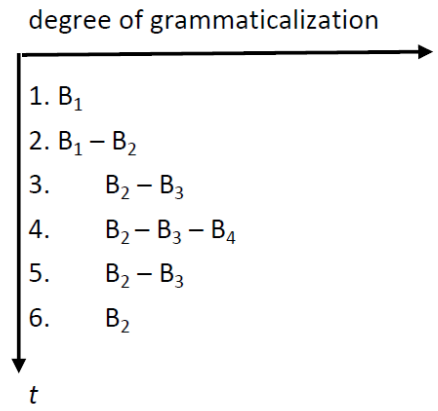


Fig. 1-9: Retraction (Haspelmath 2004: 33).

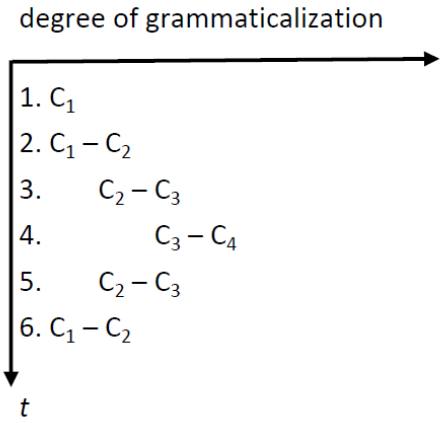


Fig. 1-10: Antigrammaticalisation (Haspelmath 2004: 34).

A completely different kind of change, with loss in the foreground, is called exaptation (Lass 1990). In an exaptive scenario an item which loses its original application (loss of form alone or loss of form and function) is recycled (exapted) to serve a different purpose ("old" form with a new function). Greenberg (1991) also proposes a similar process, called "regrammaticalization", in which a grammaticalised marker would be employed in other functions. Lass's and Greenberg's approaches share a lot in common although they were developed independently. In his work Lass proposes a division of the languages into "wasteful" and "conservationist" using the way the languages deal with a structure no longer needed as a criterion. An example of the exaptive scenario is the story of the adjectival *–e* in Middle English, which was first bleached of its case/gender and definiteness/indefiniteness content, and then exapted as primarily a marker of plurality. Later on, in the fifteenth century the *–e* was lost and the English adjective became invariable

(Lass 1990: 95). Owing to this fact Lass classifies English as "wasteful" with respect to this piece of grammatical structure.

Lass's article also gives an explanation as to why people should not be surprised by the retention of "historical junk" over long periods of time, which can be interpreted as an attempt to explain why there are residual or fossilised constructions, which persist over long periods of time, in spite of the fact that they do not get recycled and their productivity is very limited (Lass 1990: 100):

> Nonaptations persist because there is no particular problem in keeping them, and there may even be 'work' to do in getting rid of them. If these nonaptations or adaptations fallen into desuetude can be later exapted for something else, well and good; but there is no particular reason ever either to do this or not to.

With reference to probably the same phenomenon, Hundt (2014: 185), who investigates the demise of *being to VERB* construction, claims there might be a weak version of system dependency "which allows for occasional use of a 'dead' construction well beyond the period when it should, in theory, have become 'ungrammatical'."

That might be exactly the phenomenon observed by Lass – something is being kept and very occasionally used (nonaptation), because keeping it is not that problematic for the language system. Schwenter's (2015) explanation of this fact is the "surprisal effect". He observes that outdated constructions tend to be more "surprising" for the language user and thus they prime more strongly than the less surprising, frequent, constructions (Jaeger & Snider 2008). Schwenter uses the name "syntactic persistence" to describe the situation in which a construction is still occasionally used in spite of the fact that it does not constitute part of the core grammar anymore. Still, it remains open whether this strong priming effect is the reason for an obsolescent or rare constructions to stay in the language or if it is just a symptom that a given construction is something unusual for the language user.

The concept of "nonaptation" bears some similarity with marginalisation, a notion proposed by Hansen (2017), already mentioned in Section 1.1. Hansen suggests to make a differentiation between grammaticalisation "which gives rise to fully-fledged grams" and changes which result in rather marginalised markers (2017: 264):

> Marginalization does not lead to the rise of an unmarked, highly frequent grammatical operator, but to elements which occupy a peripheral position in the language system, i.e. which are either stylistically restricted or co-occur with a limited number of verbs.

Hansen claims that marginalisation might be followed by retraction as introduced by Haspelmath (2004: 33), see Fig. 1-8. Or, along the lines of Lass, it seems equally likely, that a marginalised item might just stay in its periphery as a "nonaptation" with a very limited productivity. It seems plausible that an instantiation of a marginalised construction can be seen in Fig. 1-3 (in Section 1.1), as it depicts a frequency development of an item that has never gained high popularity and frequency, on the contrary, it seems to have "always" been rare.

Since much of the research which has been done in the field of grammatical obsolescence was focused on constructions, one idea which should definitely be looked into is whether grammatical obsolescence could instantiate constructional change. Hilpert (2013: 16) defines constructional change as follows:

> Constructional change selectively seizes a conventionalized form-meaning pair of language, altering it in terms of its form, its function, any aspect of its frequency, its distribution in the linguistic community, or any combination of these.

According to this definition frequency changes always constitute a constructional change. In the case of obsolescence there is an important component of the decrease in the frequency of use, thus it would suggest grammatical obsolescence might actually be an instantiation of constructional change. Nevertheless, a closer look at one of the cases which, according to Hilpert (2013: 14), do not exemplify constructional change, namely the phenomenon of deflexion (Norde 2001), understood as a general loss of inflectional morphological categories, suggests it might not always be the case. According to Hilpert (2013: 14), changes which affect several multiple constructions at the same time represent higher-order phenomena:

> [W]henever several members of grammatical paradigm are in demise or even whole groups of paradigms disappear, there are reasons to view the change as non-

> constructional, because a higher level of grammatical organization than the construction is concerned.

So, it seems that to answer the question if a given case of grammatical obsolescence does instantiate constructional change, one should first investigate the ongoing change in detail and look at the broader perspective, rather than only focus on the constructional level.

To summarise the present section, at the end stage of obsolescence, defined as a situation in which a given construction is losing its productivity and popularity over time, there is either a complete loss of the construction, which according to Haspelmath (2004: 33) can happen to anything in language and which has nothing to do with the degree of grammaticalisation, or there are residual minor constructions and phraseological units left behind, which might result not only from grammaticalisation (Hopper & Traugott 2003; Haspelmath 2004) but also from e.g. marginalisation (Hansen 2017). These residues or fossilised forms are probably bound to remain at the periphery of the language system (just like the construction *being to VERB* studied by Hundt, 2014). Potentially they also would have a strong priming effect (as suggested by Schwenter, 2015) and they would be attested predominantly in the formal registers and formal language (Hopper & Traugott 2003; Hundt 2014). Some of them might actually, after some time, become exapted or regrammaticalised (Lass 1990; Greenberg 1991). But before the constructions disappear, become residues, fossils or minor constructions and occupy a peripheral position of the language system, there is the process of grammatical obsolescence which, depending on the given case, might or might not instantiate constructional change (Hilpert 2013).

Above, I point to links between obsolescence and some of the prominent processes of language change and phenomena accompanying them. As could be seen, obsolescence seems to situate itself somewhere "in between" all of the abovementioned potential scenarios. For now, the present work adopts this "in between" localisation and aims at finding and pointing to common grounds with almost all of the previously mentioned processes, at the same time looking for new links and interrelations. In the present dissertation grammatical obsolescence is investigated and described as a process in its own right and one which follows a diachronic dynamic of its own.

1.6 Summary

The present chapter is an introduction to the concept of *grammatical obsolescence*. The main aim was to lay the theoretical foundations on which the further research questions can be formulated. It consists of four main parts (Sections 1.2 – 1.5), each one devoted to a different aspect of the studied phenomenon. Additionally, Section 1.1 presents the structure of the present work and the major assumptions standing behind it.

Section 1.2 focuses on discussing the concept and the definition of *grammatical obsolescence*. A way of differentiating between *obsolescent*, *obsolete* and *rare* constructions has been proposed. Table 1.1 presents a short sum-up of the differences and similarities between these terms.

Adjective	**Meaning**	**Negative correlation between time and the frequency of use**	**Lack of acceptability by the language users**	**Low frequency in the last decades of the investigated period**
obsolescent	In the process of leaving the core grammar of language	yes – it is a necessary condition	no, definitely not	yes, this should be the case
obsolete	Lost; forgotten; already outside of the core grammar	no, not necessarily	yes – it is a necessary condition	yes, this should be the case
rare	A state of being infrequent; having a low frequency of use	no, not necessarily	no, definitely not	yes, this should be the case

Table 1-1: *Obsolescent*, *obsolete* and *rare* – a sum-up.

Section 1.3 looks into works that deal with the topic of the loss of grammatical items. An insight into the methods and approaches used by the different scholars has been offered, with a focus on presenting common ground between works, but also the differences in the choice of methodology, data, approach and focus.

Section 1.4 proposes that obsolescence be looked at as a non-homogenous process with at least two subtypes, namely obsolescence of form and/or function and obsolescence of form only. The basis for a differentiation between these two subtypes are causes and outcomes of the process. In obsolescence associated with the lack of formal and/ or

functional need there is no replacement, whereas if what we see is obsolescence of form with an immediate continuation of function through a different form, the cause might be competition.

Finally, the aim of Section 1.5 was to point to difficulties associated with situating grammatical obsolescence in the landscape of language change processes such as constructional change (Hilpert 2013) and grammaticalisation (Givon 1979; Dahl 2000; Hopper & Traugott 2003). Additionally, a few different scenarios concerning the potential future of obsolescent constructions such as: retraction (Haspelmath 2004); regrammaticalisation (Greenberg 1991); exaptation, or the fate of a nonaptation (Lass 1990); marginalisation (Hansen 2017); persistence in formal genres (Hopper & Traugott 2003; Hundt 2014), and occasional occurrence in less formal genres potentially due to the strong priming effect (Schwenter 2015).

As could be seen, items disappearing from the core grammar have been noticed and mentioned in the literature. Few cases have been studied in detail (see Section 1.3). The effects of obsolescence (loss or reconfigurations in the periphery of the language systems) are known, but the process itself has not yet been studied in a comprehensive way. Figures 1-8 to 1-10 show the subsequent stages in grammaticalisation, retraction and antigrammaticalisation, but what exactly happens between the stages in which earlier or later manifestations of a given construction disappear, and whether factors other than the degree of grammaticalisation play a role, remains open.

The present dissertation aims at making a contribution to the better understanding of grammatical obsolescence, and, additionally, at providing at least some counterweight to the relatively well-researched (Hundt & Leech 2012; Hundt 2014; Tichý 2018) phenomena of innovation and emergence in language.

2. Grammatical obsolescence – practical approach

The proof of the pudding is in the eating

The present chapter focuses on subsequent steps towards a development of a practical approach to the investigation of potential cases of obsolescence. The main issues which are addressed include: i) identification of potentially obsolescent constructions; ii) methodological choices for the investigation; iii) interpretation of results in the usage-based framework. Additionally, some potential problems associated with the investigation of obsolescence are discussed, and the choices of language corpora are presented and justified.

The point of departure towards a methodology to study obsolescence in grammar is provided by the survey of works dealing with grammatical items in decline presented in Section 1.3 and the theoretical approach to obsolescence developed in Sections 1.2, 1.4 and 1.5. The ultimate product of this chapter is the *criteria catalogue* – a collection of methods, ways and procedures, which are likely to prove helpful in the study of potentially obsolescent constructions.

2.1 Necessary and sufficient conditions

In the first chapter of the present dissertation it is stated that the negative correlation between time and frequency of occurrence is a necessary condition for grammatical obsolescence. This criterion is also used to make a differentiation between *obsolescent*, *obsolete* and *rare* constructions, see Table 1-1. The fulfilment of this *necessary condition* is, however, not enough to classify a construction as obsolescent. For that we would need a fulfilment of a *sufficient condition*. Schustack (1988: 93) describes the difference between *necessary* and *sufficient* conditions as follows:

> One approach to the definition of causality is to describe it in terms of necessary and sufficient conditions. A necessary condition for some outcome is a condition that must always be present for the outcome to be present, that is a condition whose absence will prevent that outcome. [...] A sufficient condition is one whose

presence guarantees that the outcome will occur, that is, a condition that can never be present in the absence of an outcome.

Could the presence of negative correlation between time and the frequency of use be, at the same time, a necessary and a sufficient condition for the determination of obsolescence? Yes, if obsolescence was a process which is only characterised by a frequency of use decreasing across time and by nothing else. In this case obsolescence would just be a label for a situation in which there is negative correlation between time and the frequency of use. Note that even though low frequency in last decades should also occur, one could imagine obsolescence observed at its early stage. This description is, however, a simplified one. Causality plays an important role in the characterization of obsolescence, it is not only a random decline in the frequency of use but there are different causes of it, typical signs, and, possibly, at least two different subtypes (see Section 1.4 and Fig. 1-7), such as obsolescence of form alone or of form and function.

Figure 2-1 symbolically depicts all cases instantiating a given phenomenon as identified by necessary and sufficient conditions. As we can see, the necessary condition is fulfilled by all cases of this phenomenon, plus, some cases from outside – cases instantiating other phenomena. The strong sufficient condition identifies the vast majority of the cases instantiating the given phenomenon, and no cases representing other phenomena. An example of a strong sufficient condition has been given in Section 1.1 of the present work, namely lack of acceptability of a given construction (present e.g. in historical data) by the language users is a sufficient condition to describe a construction as obsolete.

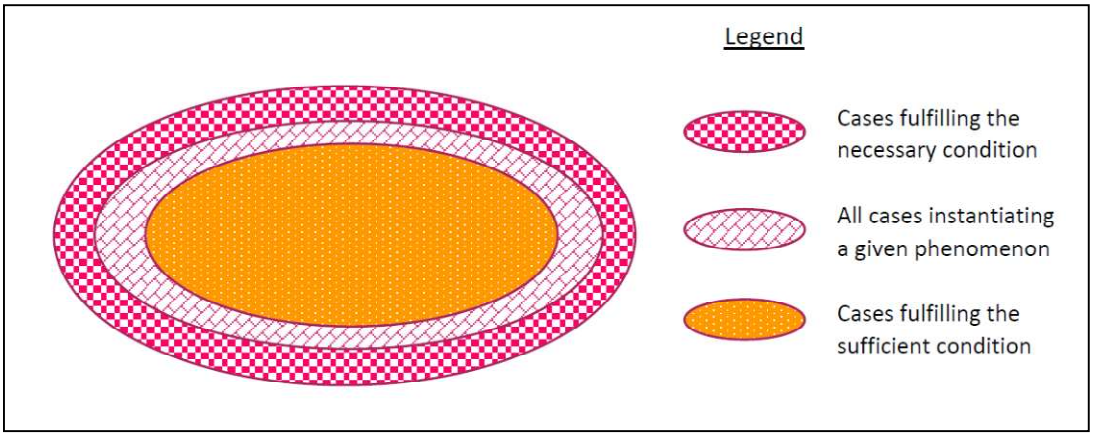


Figure 2-1: Symbolic depiction of necessary and sufficient conditions.

So, whereas the identification of a sufficient condition for obsolescence would make the investigation much easier, the negative correlation between time and frequency, as mentioned before, can only play a role of a necessary condition and not of a sufficient one.

Because of the fact that obsolescence is a complex and heterogenous phenomenon, no single sufficient condition the fulfilment of which would include (almost) all the cases instantiating obsolescence can be identified. On the other hand, chances are that many "smaller" sufficient conditions can at the end be determined, with reference to particular causes of obsolescence (e.g. obsolescence caused by competition) or subtypes of obsolescence (e.g. obsolescence of function).

2.2 Criteria catalogue

As has already been mentioned, the name of choice for the collection of methods and statistical tools which will be used in the investigation of potentially obsolescent constructions is *criteria catalogue*. The first member of the criteria catalogue is, naturally, the negative correlation between time and frequency of occurrence – the necessary condition for obsolescence.

What other criteria could be included in the criteria catalogue? One of the most obvious ones is the criterion of competition. In the study investigating the demise of *being to VERB* construction, Hundt (2014: 171) gives two important prerequisites for competition to be taken as a serious possibility in the investigation of the demise of a given construction. The first condition based on Lass (1997) is that the competing constructions have to be functionally equivalent. The second requirement, from the work by Hundt & Leech (2012: 176) is that there has to be a direct reflection of the changes in the frequency of occurrence between the construction that is winning the competition and the one that is losing it:

Along these lines, the criterion of competition could be rephrased in the form of a question: do we see any signs of direct interrelation between the decline in the frequency of the investigated construction and the increase in the frequency of potential competitor(s)? To check for the presence of the competition criterion, it is essential to analyse the broad constructional network of the investigated construction and to trace changes in the frequency of occurrence in the case of all potentially involved parties.

Another criterion we will apply for the investigation of obsolescence is the presence of higher-order processes, which represent changes above the constructional level, and which in the literature are sometimes referred to as system dependency. These higher-order processes might look like competition or include a component of competition between e.g. bigger trends in the language system. Among the works that identify system dependency as one of the reasons for the demise of the studied construction is the study by Petré (2010), already described in the first chapter (Section 1.3). Hundt (2014: 169) also refers to system dependency as to one of the ways of accounting for syntactic loss. In the present dissertation I subsume the higher-order and system-dependent changes under the heading *higher-order processes*. In order to test for this criterion one has to analyse not only the constructional network, but also search for bigger trends in the language history.

The fourth item that can be included into the criteria catalogue seems to be more of a symptom than a cause for obsolescence. It is called distributional fragmentation (Leech et al., 2009) and it refers to a situation in which almost all of the instances of a given construction seem to be concentrated in one particular genre instead of being more or less equally distributed around different genres, registers and kinds of text. Leech et al. (2009: 81) use the concept of distributional fragmentation to describe the process that is affecting *shall* in present-day English:

> With *shall* in particular we see a second possible sign of obsolescence, which may be called "distributional fragmentation". That is, instead of being dispersed in different varieties of texts in a corpus, the form tends to be increasingly restricted to certain genres and, within those genres, to certain texts.

Hundt and Leech (2012) give another example of distributional fragmentation in their description of the decline of the conjunction *for*, where they find that *for* is restricted to formal contexts. Apart from Leech et al. (2009), Hundt & Leech (2012) and Hundt (2014), also Hopper & Traugott (2003) claim that the declining constructions would be predominantly attested in formal or specialised contexts. To, however, be seen as a phenomenon accompanying obsolescence, distributional fragmentation should happen over time. If a construction was "born" in a certain genre and it simply sticks to it, this should not be treated as a symptom of obsolescence. As Leech et al. state (2009: 81) the form has to be "increasingly restricted to certain genres".

The fifth criterion is paradigmatic atrophy (Leech et al. 2009). It could be summarised as a growing restriction of lexical items to certain morphological forms and syntactic environments (Hundt 2014: 170). Paradigmatic atrophy is part of the process of grammaticalisation (Hundt 2014) where it usually combines with increase in frequency of the remaining "athropied" form, but, it can be seen as a symptom of obsolescence (Leech et a. 2009: 239) when co-occuring with declining frequencies. An example of paradigmatic atrophy are the *n't* forms of some declining modals (*must*, *shall*, *ought to*, *might*) which became scarcely usable around the end of the twentieth century (Leech et al. 2009: 82):

> [I]n this respect the modals, or at least the more 'fading' of them, have become increasingly restricted in their grammatical paradigm. That is, regarded as a morphological loss, this is arguably an aspect of paradigmatic atrophy and is thus connected with the general loss of frequency of the modals.

The criterion of paradigmatic atrophy bears some similarities with the criterion of distributional fragmentation. In the case of paradigmatic atrophy one should, however, not concentrate on the genres or registers, but look at the present and previous paradigmatic potential of a given construction. The simplest way of checking for paradigmatic atrophy would be to answer the question "Is there evidence of previously well-established paradigmatic variability that is reduced over time?" (Hundt 2014: 171).

Summing up, there are five items which will constitute the criteria catalogue for the detection and investigation of obsolescence. Three of them, namely negative correlation, distributional fragmentation and paradigmatic atrophy, could be treated as symptoms of obsolescence. Competition on a lower level and higher-order processes could be seen as potential causes for obsolescence. Figure 2-2 presents the contents of the criteria catalogue for the investigation and detection of grammatical obsolescence.

There are two more criteria that could be added to the list, namely the criterion of the strong priming effect, already mentioned in the first chapter of the present work (Section 1.5) based on Schwenter (2015), and the criterion of acceptability (grammaticality), suggested by Hundt (2014: 185), which, as discussed in Section 1.2, could be helpful to differentiate between obsolescent and obsolete constructions. But, since the main focus of the present work is on the written language, the experimental criteria shall not be included in the criteria catalogue in this version.

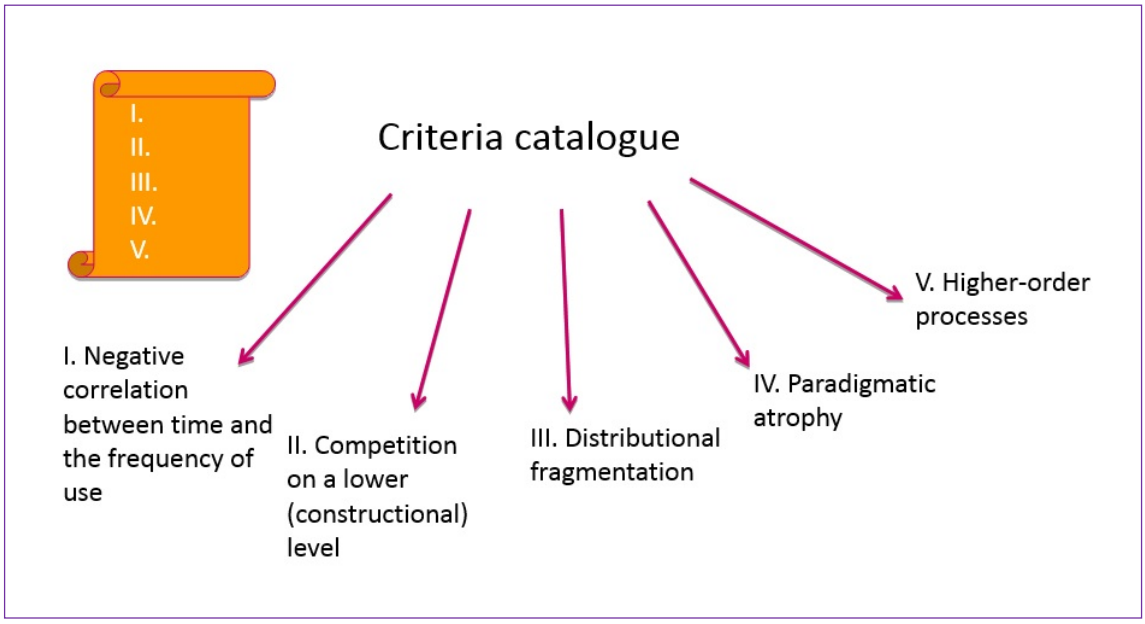


Figure 2-2: Criteria catalogue for the investigation of obsolescence.

The criteria catalogue in Fig. 2-2 gives an overview of the particular criteria. However, it is not clear how one should apply the criteria catalogue in a practical investigation. The most intuitive way would probably be to start by checking for the presence of negative correlation between time and the frequency of use (the necessary condition). But the further routine seems arbitrary, which might lead to overlooking of some symptoms in the presence of other, more visible ones. What is also missing in the design are the links between different criteria and different subtypes of obsolescence such as obsolescence of form and function.

2.3 Decision tree

One of the ways to make the application of the criteria catalogue more ordered and rigorous is to use a form of a decision tree. The MIT Encyclopedia of the Cognitive Sciences (Utgoff 1999: 223) defines a decision tree as follows:

> A decision tree is a graphical representation of a procedure for classifying or evaluating an item of interest. For example, given a patient's symptoms, a decision tree could be used to determine the patient's likely diagnosis, or outcome, or recommended treatment.

It is easy to see that the decision tree has some advantages over the use of the criteria in an arbitrary order. Even though the criteria would not change, the extra bit of structure and order could prevent the researcher from losing track of the criteria, results and possible outcomes. The first, most intuitive way of starting work with the decision tree has already been pointed at – the first question should be about the correlation between time and the frequency of use, since its presence is the necessary condition to even concern the option that a given construction might be obsolescent. Figure 2-3 presents the first, top branch of the decision tree.

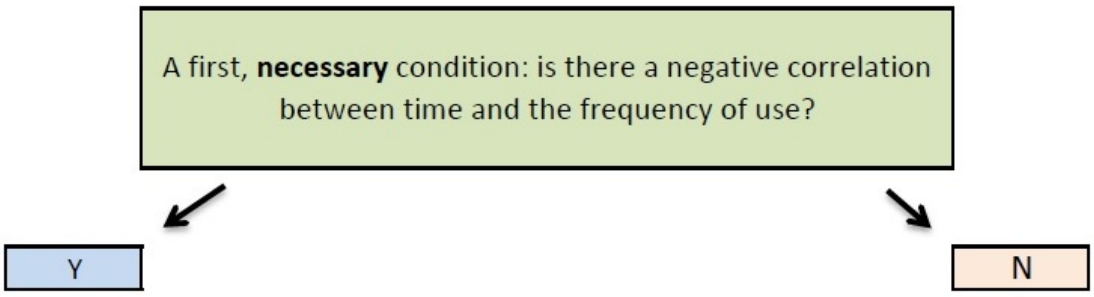


Figure 2-3: The first branch of the decision tree for the investigation of obsolescence.

According to the approach taken by the present work, only the positive answer to the first question of the decision tree would let us go down to the next branch. If the answer to this first question is negative, we are informed that at this stage there is no reason to consider that what we observe is obsolescence (see Fig. 2-4). The remark in brackets "it might, however, be obsolete or rare" serves the purpose of pointing to two other possible options for a construction to have low or very low frequency of occurrence. Of course not every construction which is not obsolescent is obsolete or rare, but it is assumed that the criteria catalogue for obsolescence will not be used for the investigation of popular, fully productive and frequent constructions. After the step presented in Fig. 2-4 there is no further branch to go to, as the tree is designed for the study of potentially obsolescent constructions only.

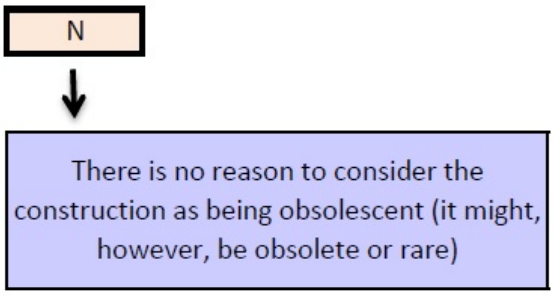


Fig. 2-4: The result of a negative answer to the first question of the decision tree.

The situation is different if we do observe a negative correlation between time and the frequency of use. If that is the case, we enter the decision tree with all its questions and potential explanations. The second branch we find ourselves on, is about competition on the constructional level (see Fig. 2-5).

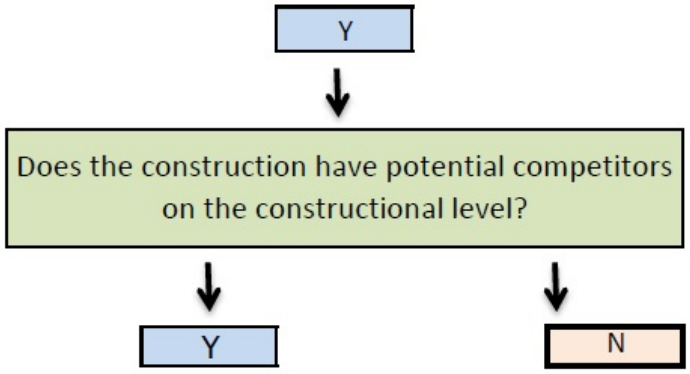


Fig. 2-5: The result of a positive answer to the first question of the decision tree.

When it comes to the next steps, there actually seem to be many possibilities, as no sufficient condition for obsolescence has so far been identified. Thus, in order to get a comprehensive picture of a given case, all the criteria need to be tested for.

Figure 2-6 presents the full criteria catalogue in the form of a decision tree. As can easily be seen, there is a stable colour pattern – questions are green; Y for *yes* is always blue, N for *no*, orange; everything that contains the word obsolescence and offers potential explanations is reddish. There are almost twice as many branches with questions as there are items in the criteria catalogue. This has to do with the intended "user-friendliness" of the decision tree. The function of the additional questions is to help the researcher get a better picture of the constructional network of a given construction.

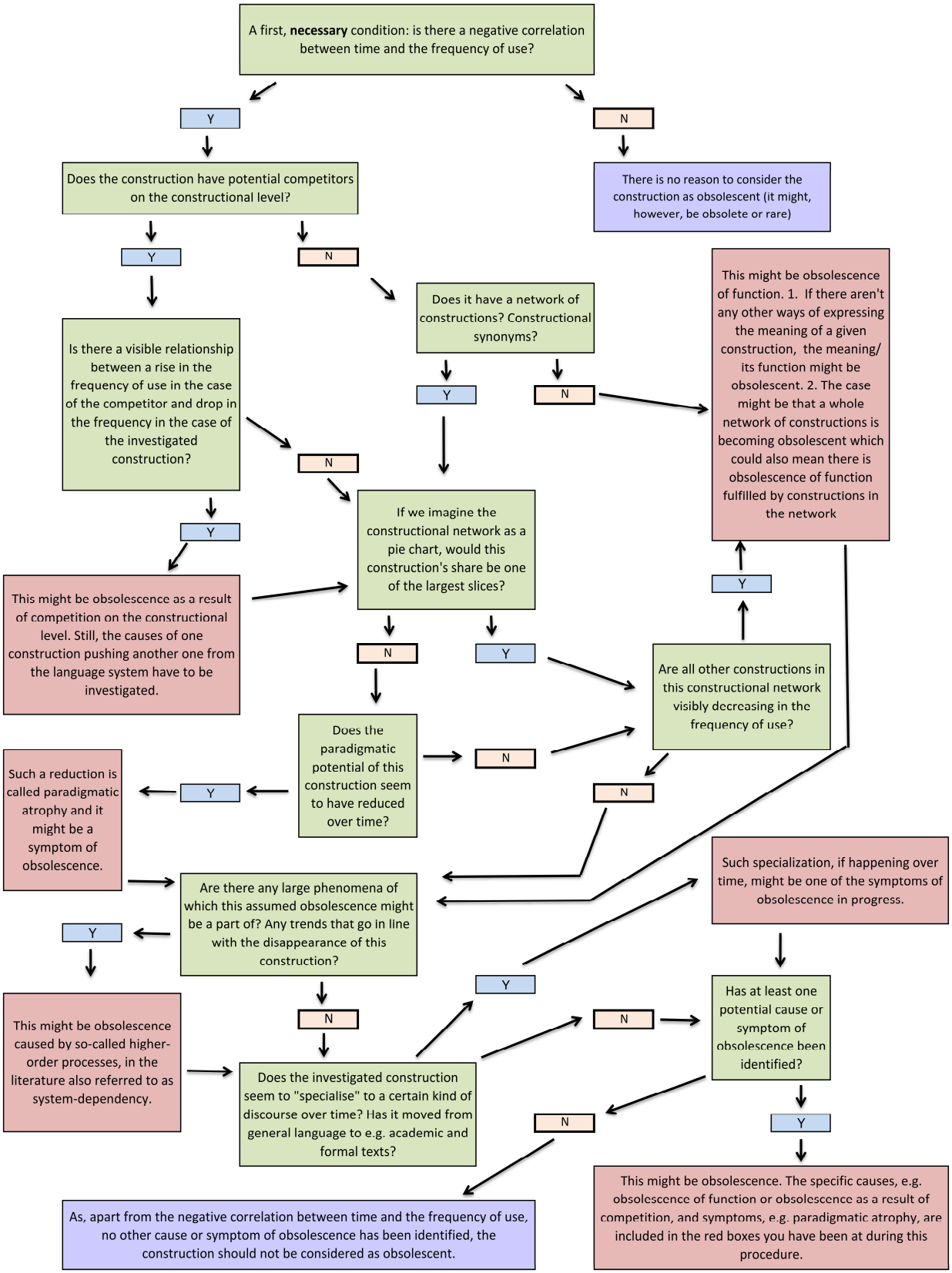


Fig 2-6: Criteria catalogue in the form of a decision tree.

It is impossible to quit the decision tree before answering all questions even if we are almost sure that, for instance, what we observe might be caused by competition on the constructional level and nothing else (for example paradigmatic atrophy or system dependency) has ever played a role. Even in a case that seems to be apparently simple it is advisable to go down the whole decision tree if only to put the initially plausible analysis on a surer footing.

The form of a decision tree gives us a chance to include hints and tips for the researcher, i.e. supplementary questions focused on the status of the construction in the constructional network. These additional questions are aimed at including the possibility of differentiating between the obsolescence of form (caused by, for instance, competition on a constructional level) and obsolescence of function (if a given construction is, for example, a sole example of a construction fulfilling a given function, i.e., it has no synonyms, it is not embedded in any constructional network).

Even if we arrive at the leaf stating that what we see might be obsolescence of function, the design of a decision tree requires us to continue and to check for each of the criteria from the criteria catalogue that might still apply to this construction. Most of the criteria and questions are not mutually exclusive.

2.3.1 The limitations of the criteria catalogue

As far as the limitations of the criteria catalogue are concerned, the issue of data scarcity and sparsity has to be looked at. Hundt (2014: 176) in her study on the decline of *being to VERB* construction tries to determine whether paradigmatic atrophy played a role in the decline of the studied construction. She, however, comes across many difficulties, caused by the fact that the studied construction is, and has always been, very rare.

When it comes to paradigmatic atrophy, she finds it hard to arrive at a definite conclusion: “One reason may be that ARCHER-3.2 is simply too small to provide reliable evidence of the true paradigmatic variability of the *be to VERB* construction”. From that we can conclude, that very infrequent constructions might be harder to investigate, because of, simply, lack of data. These problems can be partially solved by the use of mega corpora (see Section 2.4), or the “grab-any-source” approach. In a case in which collecting a reliable data set seems impossible, the application of the criteria catalogue would not make a lot of sense.

Still, for cases which seem to be only relatively rare, the decision tree stays a valid option, as it would not pose a big problem if we left, for instance, one branch unanswered (if we gave a *no* answer because of the fact that we would not have enough data). Even if we had too little data to check for e.g. distributional fragmentation or paradigmatic atrophy, we could still arrive at some concrete conclusions and the decision tree would help us develop a bigger picture of the constructional network.

Another limitation, which has already been hinted at, is that the criteria catalogue does not contain any experimental criteria, even though there are indications (Hundt 2014; Schwenter 2015) that the application of some psycholinguistic experiments, such as priming experiments or acceptability judgements, could be helpful in the determination of obsolescent cases.

The present version of the criteria catalogue is primarily intended for the investigation of the written language, although it could, potentially, be extended also to the spoken language, provided that one has enough corpus data to check for the particular criteria and conduct particular tests (such as, above all, correlation testing).

2.4 Corpora and the investigation of obsolescence

Investigation of language features that lose the frequency of use differs from the investigation of features that note an increase in the frequency. In particular in the end stages of obsolescence the issue of data scarcity might become an issue. As Tichý, who does research on lexical obsolescence, states (2018: 84):

> From a practical point of view, it is much simpler prove that something exists (or has come to existence) than to prove that something does not exist (or has ceased to exist). To prove something requires evidence and while evidence of existence is easily observable, evidence of non-existence is not or as the aphorism goes: "absence of evidence is not evidence of absence".

If, as in the case of the present work, research is done on the topic of obsolescence in progress in the period of the last two hundred years, it seems somewhat unlikely that we will not be able to see any instances of the studied construction. If, however, we do fail to find any instances of this given construction, it does not necessarily mean it already has disappeared. The observed disappearance in such a case might, very likely, be a symptom

of the already mentioned data scarcity – a situation in which we have very little or no data because the construction is already rare. As has already been hinted at in the final part of Section 2.3, one of the potential solutions to this problem might be the use of modern diachronic mega-corpora.

As an attempt to "nip the problem in the bud", the present work by default uses the diachronic mega-corpora such as the Corpus of Historical American English (COHA) and the Corpus of Contemporary American English (COCA) as the main corpora for the particular studies. The fact that both of these corpora are corpora of American English has a partial influence on the choice of the language variety for the present study (see Section 3.3). Apart from COHA and COCA, also the NOW (News on the Web) corpus and the Brown family of corpora are used to offer even more insights into the different diachronic developments.

Sections 2.4.1 – 2.4.4 briefly present the corpora which are to be used in this work to collect data, to look for trends and interrelations, and, to put the criteria catalogue itself to the test.

2.4.1 COHA

COHA is the largest diachronic multi-genre corpus of American English available online at https://corpus.byu.edu/coha/. It contains 400 million words of text from the time period 1810-2009. COHA is balanced by genre across decades. There are four genres represented in the corpus, namely *fiction,* containing e.g. texts from scanned and digitised books and movie and play scripts; *magazine* which contains texts from digitised and scanned magazines e.g. modern magazines such as *Time* and *Sports Illustrated* and nineteenth century magazines such as *Yale Review* and *The North American Review*; *newspaper* which contains texts from digitised articles from e.g. *The New York Times* and *The Washington Post*; *non-fiction* containing texts from scanned and digitised books and from academic peer-reviewed journals such as *Journal of Rehabilitation Research* or *Development* or *Physics Today*.

2.4.2 COCA

COCA stands for Corpus of Contemporary American English. It contains over 560 million words of text from the time period 1990-2017. The corpus is evenly divided between five genres, namely *fiction, newspaper*, *popular magazine*, *academic journals* and *spoken*, thus with regard to genres, COCA has some overlap with COHA, and indeed,

some of the COCA contents are included into the last decades of COHA. According to the information on its website, on which it is also available (https://corpus.byu.edu/coca/), COCA is "the largest freely-available corpus of English, and the only large and balanced corpus of American English".

2.4.3 NOW

As of April 2018, the NOW corpus contains almost 6 billion words of data and is said to be growing every day by about 4-5 million words. It is available at https://corpus.byu.edu/now/. The name of the corpus stands for News on the Web, as the corpus contains data from web-based newspapers and magazines. The time period is 2010 to the present time. The corpus features the varieties of English from the following countries: the United States, Canada, Great Britain, India, Australia, Ireland, South Africa, Nigeria, New Zealand, Singapore, Malaysia, Philippines, Pakistan, Ghana, Kenya, Sri Lanka, Jamaica, Bangladesh, Hong Kong and Tanzania. As can be read on its website, NOW enables the users to see "what is happening with the language this week – not just 10 or 20 years ago".

2.4.4 Brown family of corpora

The Brown family consists of several corpora which are all modelled on the original Brown University corpus. Currently, among the corpora which belong to the Brown family there are: Brown (written American English, 1961), LOB (written British English, 1961), Frown (written American English, 1992), F-LOB (written British English, 1991), B-Brown (written American English, 1931), BLOB-1931 (written British English, 1931). Each of the corpora contains about 1 million words divided between the four main genres (*fiction*, *press*, *learned*, *general prose*), which are further divided into fifteen subsections e.g. *reportage*, *editorial* and *review* are subsections of *press*, while *science fiction* and *humour* are some of the subsections of *fiction*.

2.5 Criteria catalogue in practice – overview of following chapters

The next chapter in which we are going to come back to the decision tree, presented in Fig. 2-6, is Chapter 9, the Section 9.1 of which is devoted to, solely, the practical application of the decision tree procedure for the detection and investigation of obsolescence. The application of the decision tree is presented on a step-by-step basis.

Chapters 4 to 8 focus on particular criteria from the criteria catalogue as presented in Fig. 2-2 applied to the constructions from the investigated network.

The decision tree will not be used in Chapters 4-8 because of the fact that it requires us to have all the answers to relatively complex questions concerning e.g. the constructional network, the distribution of the construction across genres, the presence of competitors on higher and lower levels etc. at our disposal. The idea behind this structure is to first collect all the results and then use them to conduct a decision tree analysis. This way we will gradually move from a close-up perspective, offering us just a small piece of the puzzle, to a broader perspective, which is much more likely to show us the bigger picture.

2.6 Summary

The present chapter has offered an approach to the investigation of obsolescence and discussed different criteria that could be helpful. Furthermore, it has introduced the criteria catalogue as a set of tools for the investigation of obsolescence in the written language. Going beyond the presentation of the criteria catalogue as relatively unstructured toolkit (Fig 2-2), a form of a decision tree has been offered (Fig. 2-6). Table 2-1 compares the criteria catalogue in the form of loosely connected collection of criteria with the decision tree design.

Different features	**Loosely connected collection of criteria**	**Decision tree**
Criteria	All five criteria present	All five criteria present
Structure	No sequential order	Well-structured, guides the researcher through the different possibilities
Interpretation of results	No interpretation possibilities offered	Offers preliminary interpretation of results
Different kinds of obsolescence	Does not mention different kinds of obsolescence	Differentiates between obsolescence of form (caused by e.g. competition) and obsolescence of

		function (e.g. in the case of constructions with no constructional network)
Freedom	Offers freedom of choice since no sequential order is provided	Little freedom offered, one cannot exit from the decision tree without answering all the questions
Formulation of the criteria	Only names, no definitions and explanations	Form of questions, less formal

Table 2-1 Comparison between the criteria catalogue in two different forms.

Section 2.4 has focused on the corpora which are used in the present study. Each corpus is briefly described, above all in the context of the number of words, covered time period and the genres represented, see Table 2-2 for a summary of the basic pieces of information.

Corpus	Number of words	Language variety	Time period	Genres
COHA	400 million words	American English	1810-2009	Four genres: *fiction, newspaper, magazine, non-fiction*
COCA	520 million words	American English	1990-2015	Five genres: *fiction, newspaper*, *popular magazine*, *academic journals*, *spoken*
NOW	5.9 billion words (it is growing by 4-5 million words per day)	English varieties from: United States, Canada, Great Britain, India, Australia,	2010- now	web-based newspapers and magazines

		Ireland, South Africa, Nigeria, New Zealand, Singapore, Malaysia, Philippines, Pakistan, Ghana, Kenya, Sri Lanka, Jamaica, Bangladesh, Hong Kong, Tanzania		
The Brown family of corpora: B-Brown, BLOB-1931, Brown, LOB, Frown, FLOB	Approximately 1 million words per corpus	American English and British English	1931; 1961; 1992	Four main genres: *fiction*, *press*, *learned*, *general prose* Fifteen subsections of the main genres

Table 2-2: Corpora used in the practical part of the dissertation.

3. Subordination of purpose as the case study

Many a little makes a mickle

The two previous chapters have presented the theoretical framework designed for the study of grammatical obsolescence. A natural continuation is the selection of a case study variable, which being relevant for the problem, would also allow for an application of the whole criteria catalogue.

In the present study I address a trend observed in the history of English in which finite clauses are being superseded by non-finite clauses. As Mair & Leech (2006: 335) state:

> Nonfinite verbal forms – infinitives, gerunds and participles – are another grammatical category which has become more functionally prominent, and correspondingly more frequent in discourse, since the Middle English period.

Similarly, Los (2005: 18) in her study on the rise of the *to*-infinitive in English claims that the considerable increase in the frequency of *to*-infinitives in Middle English (ME) occurred at the expense of finite subjunctive *that*-clauses:

> There is evidence from different mss of the same OE [Old English] text which strongly suggests that the rise of the *to*-infinitive occurred at the expense of the finite subjunctive clause; these findings are confirmed by a quantitative investigation, which reveals that the massive increase in *to*-infinitives in ME is due to a corresponding decrease not in bare infinitives but in subjunctive *that*-clauses.

In terms of grammaticalisation, this trend could be subsumed as an overall contraction of the elaborate variant, which seems to be gradually replaced by simpler forms. It is not hard to imagine that this effect has to do with an increase in frequency of one variant and simultaneous decrease, or potential obsolescence, of the other variant. Of course, it would be too much to claim that the whole class of finite clauses goes out of use. On the other hand, the downward developments of the frequency inside a concrete network of a limited

size could well instantiate obsolescence in progress. To conclude, the described phenomenon is a promising source of potentially obsolescent constructions.

The choice of a concrete variable was provided by a simple search in COHA[12], which revealed that the construction *in order that* has recently noted a dramatic decrease in the frequency of occurrence (see Fig. 3-1). At the same time, the non-finite subordinator of purpose, *in order to*, seems to present a much milder form of decrease (Fig. 3-2).

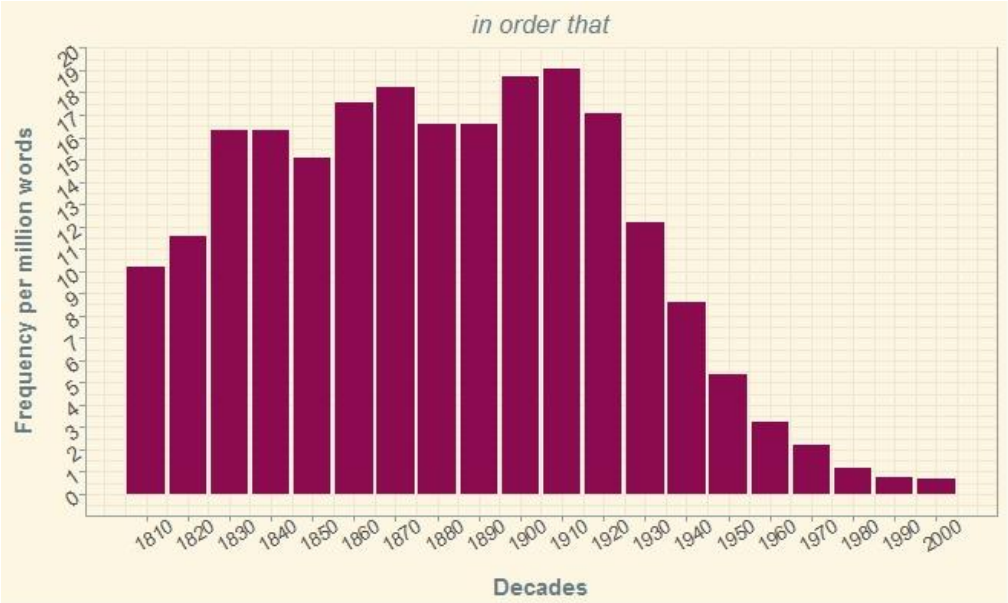


Figure 3-1: Frequency of occurrence of *in order that* across the time period 1810-2009.

Figure 3-2: Frequency of occurrence of *in order to* across the time period 1810-2009.

[12] Data retrieved from COHA on October 11 2017.

Since *in order that* is a subordinator introducing finite clauses, it is likely that the large decrease in its frequency might be part of a trend described above, in which non-finite clauses become more functionally prominent at the expense of finite clauses.

The network of subordinators of purpose seems to be adequate for studying obsolescence also because of at least two more reasons. Apart from some signs of potential for obsolescence among its variants, it also has a relatively well-developed constructional network, and, the developments within this network have not been yet studied in the context of syntactic loss.

The following sections of this chapter are focused on different aspects of subordination of purpose. Section 3.1 offers some background information on the typology of purpose clauses, whereas Section 3.2 introduces the constructions which are subject of this study, provides insights into their history and summarises recent developments in the constructional network of subordination of purpose. Section 3.3 justifies the choice of written American English as the language variety for the present study. A short summary is given in Section 3.4.

3.1 Purpose clauses in English and beyond

In functional terms, a purpose construction is a construction which is encoding a specific relation between events. According to Schmidke-Bode (2009: 14) this relation can be described as one verbal situation (that of the matrix clause) being performed with an intention of bringing about another situation, namely that of the purpose clause. Similarly, Cristofaro (2013) describes the interrelation between the main clause and the purpose clause as "such that one of the linked events (the one coded by the main clause, or the main event) is performed with the goal of obtaining the realisation of another one (the one coded by the purpose clause, or the dependent event)". In (1) – (3) the purpose clause is indicated by the use of square brackets.

(1) *I ordered two more books [in order to meet the requirement of membership]*.
(COHA: 1981; News: Chicago Tribune)
(2) *I ordered two more books [to meet the requirement of membership]*.
(3) *I ordered two more books [in order that we could meet the requirement of membership]*.

As they were developed for typological research, the definitions of purpose clauses proposed by Schmidtke-Bode (2009) and Cristofaro (2013) are broad enough to encompass the non-finite purpose clauses, such as (1) and (2), and finite purpose clauses, such as e.g. (3), no matter if they are introduced by a purpose subordinator, like in (1) and (3), or not, like in (1). Cristofaro (2013) emphasises that a definition that could be used in typological cross-linguistic comparisons has to also account for cases that would not be regarded as purpose clauses according to traditional morphosyntactic criteria.

Looking from a cross-linguistic perspective, how many ways of expressing purpose-related situations are there? An answer to this question seems very difficult and, depending on the approach adopted, there might not even be a single correct answer. Looking beyond English, Schmidtke-Bode (2009: 199-201), in his comprehensive cross-linguistic typology of purpose clauses, identifies five recurrent types of purpose constructions:

(i) Finite purpose clauses which are often introduced by complex purpose markers consisting of a resultative or intentional element (such as *so*) followed by a general complementiser (e.g. *that*). Some of the typical features of finite clauses include marking for mood and overt realisation of the semantic arguments.

(ii) Non-finite purpose clauses which are most often instantiated by infinitival or nominalised clauses. By default, they contain non-finite verb forms. As Schmidtke-Bode (2009: 200) states, non-finite purpose clauses "represent the most economical way of expressing purpose" and "iconically reflect a high degree of integration of the purpose clause into its associated matrix clause".

(iii) Motion-cum-purpose constructions, which are clauses containing a component of moving somewhere with an aim of achieving a certain goal. The matrix clause typically contains a verb of motion. According to Schmidtke-Bode (2009: 201), constructions of this type "show a particular propensity for economical coding (e.g. implicit arguments, non-finite verb forms, omission of overt purposive conjunctions, tight integration into the matrix clause").

(iv) Constructions with purposive inferences, possibly result from two events which are causally related – e.g. by an intention of bringing about the second event. Over time, such pragmatic inferences might be reanalysed as

purposive conjunction, provided they are salient enough. A development of this kind is likely to result in finite purpose clauses.

(v) Avertive ("lest") constructions, which subsume all the constructions used for the expression of the so-called "negative purpose" – the main intention is not to bring about a certain situation or to achieve a certain goal (as is in "positive purpose" constructions) but to prevent something from happening. An example of an avertive construction is the English monomorphemic marker of negative purpose – *lest*.

Acording to Schmidtke-Bode (2009: 202) all of these five construction types are instantiated in Present Day English and "we also find evidence for all major grammaticalisation processes leading to their existence and further development".

One of the most natural distinctions that is made between these construction types is that between finite and non-finite purpose clauses. They differ in their structure and content (typically finite vs. non-finite verb forms) and, to some extent, in their function, since the finite purpose clauses are typically used for different-subject situations and the non-finite purpose clauses for same-subject situations. Schmidtke-Bode (2009: 200) sees the two types of constructions as complementary:

> Non-finite and finite purpose clause constructions can be seen as complementary. Whereas non-finite purpose clauses are used for the canonical same-subject situations, finite clauses can be employed whenever participants need to be made overt (e.g. different-subject situations), provided that a language has both construction types.

Nevertheless, the criterion of finiteness or non-finiteness is not the only way to describe the purpose clauses and to differentiate between them. Following the distinction of Stassen (1985), Cristofaro (2013) classifies verb forms in purpose clauses as either balanced or deranked, the corresponding clauses are, analogically, called balanced or deranked. According to her approach, the distinction between finite and non-finite verb forms is, above all, based on morphological criteria, i.e. reduced inflectional potential being typical for non-finite verb forms, and full inflectional potential for the finite verb forms. The distinction between balanced vs. deranked verb forms "is based exclusively on the ability of a verb form to occur in independent declarative clauses" (Cristofaro 2013).

The distinction between balanced and deranked purpose clauses is very useful in the domain of language typology. As Cristofaro states "[f]or any given language, a purpose clause can be coded by deranked verb forms only, by balanced verb forms only, or by either deranked or balanced verb forms". Along these lines, The World Atlas of Language Structures Online (WALS)[13] features maps and statistics classifying the languages of the world with regard to the purpose clauses used. For the feature of purpose clauses, WALS contains data from 170 languages and classifies them into languages having exclusively balanced purpose clauses, languages having exclusively deranked purpose clauses and languages having both balanced and deranked purpose clauses. Table 3-1 sums up the statistics from WALS[14].

Purpose clauses	**Number of languages**
Balanced	38
Deranked	102
Balanced/deranked	30
	Total number of languages: 170

Table 3-1: Types of purpose clauses in the world's languages included in WALS.

The map which is available on the website of WALS presents the distribution of particular types of purpose clauses across the languages of the world. As can easily be seen, the majority of languages in the world have exclusively deranked purpose clauses. These languages are common in many parts of the world, in Europe they include: French, Spanish, Italian, Hungarian; in Asia: Persian, Kashmiri, Marathi, Tamil; in Africa: Hausa, Zulu, Cameroonian and many more. The number of languages having exclusively balanced purpose clauses is almost three times lower; among them we have e.g. Korean, Vietnamese, Indonesian and South American Guarani. There is no European language which would only have balanced purpose clauses. The lowest number of languages have both balanced and

[13] The World Atlas of Language Structures (WALS) is a large database of structural (phonological, grammatical, lexical) properties of languages gathered from descriptive materials (such as reference grammars) by a team of 55 authors (http://wals.info/, accessed on October 17, 2017).
[14] Data retrieved from WALS (http://wals.info/chapter/125) on October 17, 2017.

deranked purpose clauses. Among those languages there are Finnish, German, Russian, Japanese, Arabic, Modern Hebrew and BerBer.

With regard to purpose clauses, English situates itself among the langugaes having both balanced and deranked purpose clauses. According to Cristofaro (2013) "Europe is divided into two clear-cut areas, with languages with both balanced and deranked purpose clauses towards the north, and languages with exclusively deranked purpose clauses towards the south." Having Irish from the West and German from the East, English situates itself more on the northern side of that line. Figure 3-3 shows the distribution of particular types of purpose constructions around Europe.

Fig. 3-3: Distribution of purpose constructions across languages in Europe[15] (taken from WALS 2013).

3.2 Subordinators of purpose – the past and the present

The present section introduces the network of English purpose subordinators as the subject of the study of potential obsolescence in progress. Some general remarks and example sentences will be offered first, followed by a more detailed description and insights into the history and the present situation of each of the studied constructions, starting in Section 3.2.1.

[15] © OpenStreetMap contributors (https://www.openstreetmap.org/copyright/en).

As has been mentioned in Section 3.1, there are many ways of denoting purposive semantics in the English language. One of them is the use of subordinators of purpose introducing finite and non-finite clauses. For the sake of manageability and clarity, the main focus of the present dissertation is on constructions which are used exclusively for the expression of purpose and not, for instance, for both purpose and result (for example *so that*) or for the expression of implicit purpose, i.e. conditionals and clauses with reason adjuncts (Huddleston & Pullum 2002: 727, 730).

Thus, the main focus here is on the network of English purpose subordinators as instantiated by *in order to* (4), *in order that* (5), *in order for to* (6), *so as to* (7) and *lest* (8):

in order to *(in order not to)* – infinitival clause without notional subject

(4) *Lawyers are attempting to get another hearing in order to obtain permission for the demonstrations.*

in order that – finite clause

(5) *Lawyers are attempting to get another hearing in order that the demonstration can go ahead.*

in order for * to – infinitival clause with notional subject (for-NP)

(6) *Lawyers are attempting to get another hearing in order for the demonstrations to go ahead.* (COCA: 2011; NEWS: Christian Science Monitor)

so as to *(so as not to)* – infinitival clause without notional subject

(7) *Lawyers are attempting to get another hearing so as to obtain permission for the demonstrations.*

lest (negative purpose) – finite clause

(8) *Lawyers are attempting to get another hearing lest they lose permission for the demonstrations.*

Nevertheless, we will have a look at some of the other ways of purpose realisation (even if their use is not limited to the expression of purpose) at least to check for potential competitors and in order to get a broad picture of the constructional network. Some of these include:

***to*-infinitive in its purpose function** – infinitival clause without notional subject

(9) *Lawyers are attempting to get another hearing <u>to</u> obtain permission for the demonstrations.*

so (that) – finite clause

(10) *Lawyers are attempting to get another hearing <u>so (that)</u> the demonstration can go ahead.*

One can instantly see that there are both finite and non-finite purpose subordinators in the constructional network. In the context of obsolescence, if *in order that* has been losing the frequency of use rapidly in the recent ten decades (see Fig. 3-1), what is the situation of other subordinators? Sections 3.2.1 – 3.2.5 offer an in-depth presentation of each of the variants, including first checks on their diachronic frequency developments.

3.2.1 In order to

The most frequent of the five investigated constructions. Example sentence provided in (4). Also, the one which shows the mildest form of decrease in the frequency (see Fig. 3-2). Used almost exclusively for same-subject situations. According to the OED Online[16] the first attestation of the purpose subordinator *in order to*, as we know it today, with infinitive expressing purpose, is from 1609.

What happened before the beginning of the 17th century? According to Łęcki & Nykiel (2017: 238), the lexeme *order* is a loan word from Old French, which has first occurred in English around 1200. The same work acknowledges the first occurrence of the syntagm *in order* in the period of Late Middle English. Its function was that of an adverbial of manner and its meaning close to "in order, in sequence". Łęcki & Nykiel (2017: 242) note that it was around the end of the 16th century that *in order* first started to be complemented by *to*.

OED Online notes the presence of two more constructions sharing the same morphological form as the purpose subordinator *in order to* which, however, had a slightly different meaning and usage. Both of these constructions are already obsolete. Their

[16] OED Online, s.v. *in order to*, retrieved on October 12, 2017 from http://www.oed.com.

lifespan had some overlap with the occurrence and existence of *in order to* with infinitive expressing purpose, as they both are first attested in the sixteenth century (early and late).

The first one was, according to OED Online, used in the following sense "with regard or respect to, in reference to; for the sake of". It was a rather short-lived construction, with its last attestation in the middle of the seventeenth century. The second one survived until approximately the middle of the nineteenth century, its meaning being "with a view to the bringing about of (something), for the purpose of (some desired end)". OED classifies it as being closer to the present-day English *in order to* (4). See (11) and (12) for example sentences with the two already obsolete constructions containing the syntagm *in order to*.

(11) *Wee come to their punishment, which is necessary for us to know, in order to this subject.* (OED, s.v. order def. P3†(a): 1646 H. Lawrence *Of Communion & Warre with Angels* 56)

(12) *In order to the existence of love between two parties, there must be a secret affinity between them.* (OED, s.v. order def. P3†(b): 1869 E. M. Goulburn *Pursuit of Holiness* viii. 67)

How did *in order to* start its presence in the English language as a subordinator of purpose? Schmidtke-Bode (2009: 174) hypothesizes that after the usage of the *to*-infinitive was increasingly extended during the late Old and Middle English period, its original purposive function needed reinforcement and the emergence of *in order* in front of the *to*-infinitive in the early 17th century fulfilled precisely that function.

Łęcki & Nykiel (2017: 249) suggest that *in order to*, along with *in order that* might have entered the language as an answer to the increase in the use of hypotactic sentence structures in Modern English, and the resulting "demand for the language to be flexible and precise [which] brought about a need on the part of the writers to enrich their inventory of purposive conjunctions".

What is the situation of *in order to* in Present Day English? Fowler's Dictionary of Modern English Usage (2015: 416) treats the purposive *to*-infinitive and *in order to* as nearly synonymous, giving the greater formality of *in order to* as one of the potential reasons for the choice of this form over the *to*-infinivive:

> There is clearly room for both constructions. It is hard to pin down reasons for the choice of the longer form, apart from its greater formality. The presence of a different kind of *to*-infinitive in the vicinity (…) may sometimes be a factor, as will considerations of rhythm and emphasis.

The explanation offered by Fowler's Dictionary bears some similarities with the hypothesis of Schmidtke-Bode, as it lists the presence of a *to*-infinitive in the vicinity as one of the reasons for the choice of *in order to*. If, as Schmidtke-Bode suggests, the usage of the *to*-infinitive extended greatly in the past, and the addition of *in order* in front of *to* was an answer to that, it should not be surprising that the presence of another *to*-infinitive, probably used to express a meaning different from the purpose-related one, would still make language users choose *in order to* over *to*-infinitive, even if it was only for the purpose of clarity and unambiguousness.

3.2.2 In order that

Significantly rarer than *in order to, in order that* displays a dramatic decline in the frequency of use from approximately 1920s (See Fig. 3-1). It introduces finite clauses and is used for, almost exclusively, different-subject situations, thus occupies a different functional niche than, for instance, *in order to*, which is exclusively used for same-subject situations. According to Kortmann (1997: 300, Table 10.3) *in order that* belongs to subordinators which entered English in "the 18th century or later". The first attestation of *in order that* in OED online[17] is from 1671. OED Online attributes the following meaning to *in order that* "with the aim or purpose that; to the end that". See (5) and (13) for an example sentences.

> (13) *A group of preservationists who sought an injunction to stop the construction in order that further archaeological work could be done.* (OED, s.v. order def. P6: 1992 *Caribbean Week* Apr. 25/1)

Łęcki & Nykiel (2017: 248) perceive the emergence of *in order that*, approximately sixty years after the first attestation of *in order to*, as puzzling given the syntactic changes happening in the period of Early Modern English, as instantiated by the processes in which

[17] OED Online, s.v. *in order that*, retrieved on October 12, 2017 from http://www.oed.com.

finite adverbial and relative clauses became increasingly replaced by infinitival clauses (a trend noted by e.g. Görlach 1991: 97 and Mair & Leech 2006). The emergence of *in order that* as a subordinator of purpose in the first half of the 18th century might, as suggested by Łęcki & Nykiel (2017: 249), be an instantiation of the process of renewal (as described by Hopper & Traugott 2003: 122, "a process whereby existing meanings may take on new forms") since according to the their previous works *in order that* replaced some of the older purpose constructions such as *to the intent that* and *to the end that* (Nykiel & Łęcki 2013; Łęcki & Nykiel 2014).

What about the situation of *in order that* in the present? Nykiel (2014: 9) writes on the present situation of *in order that*: "*[i]n order that* is, however, short-lived as a subordinator as it only ekes out an existence in formal registers after 1900". Also Fowler's Dictionary of Modern English Usage (2015: 415) judges *in order that* as more formal than e.g. *so that*. These judgements might refer to a phenomenon which the present work treats as one of the possible symptoms for grammatical obsolescence, namely, distributional fragmentation (See Section 2.2). Although there clearly is need for much more investigation, these hints, along with the dramatic decline in the frequency of occurrence and the current rareness of the construction, may suggest *in order that* might actually instantiate a case of obsolescence in progress.

3.2.3 In order for * to

It is a relatively young construction, first example of its use as a purpose subordinator with an object and a *to*-infinitive in the OED is from 1936:

> (14) *<u>In order for</u> these machines <u>to</u> produce even harmonics it would be necessary for,* [etc.]. (OED, s.v. order def. P5: 1936 R. S. Glasgow *Princ. Radio Engin.* i. 22)

*In order for * to* shares some common features with both *in order to*, since it introduces an infinitival clause, and *in order that*, as it is used, above all, for different-subject situations. It is the only one, out of all the studied variants, showing an increase in the frequency of use in the last decades (see Fig. 3.4), its frequency of occurrence itself being, however, very far from high. Fowler's Dictionary of Modern English Usage (2015: 416) suggests *in order for * to* as a useful alternative for the use of *in order that*.

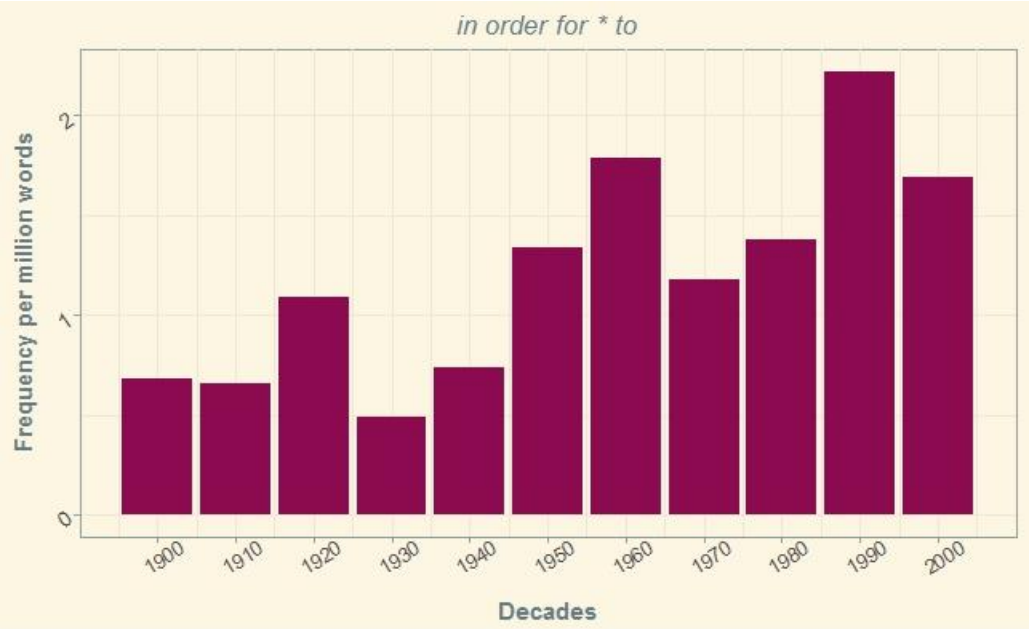


Figure 3-4: Frequency of occurrence of *in order for * to* across the time period 1900-2009[18].

How did *in order for * to* come into being? Works of Mair & Leech (2006) and De Smet (2013) suggest that the introduction and subsequent increase in the frequency of occurrence of *in order for * to*, might be part of a larger trend in the English language, namely the trend in which infinitival clauses with notional subject introduced by *for* are increasing in the frequency of use. As Mair & Leech point out (2006: 336):

> Infinitival clauses with an explicit notional subject introduced by *for* (e.g. constructions such as *it is easy for common ground to be forgotten in disputes over methods* or *they arranged for us to be met at the station*) are clearly on the increase – from 294 instances in LOB to 332 in F-LOB – and so are gerundial complement clauses.

Could it be that this increase in the frequency of *in order for * to* happens at the expense of variants introducing finite clauses, such as *in order that*? Later on, in Chapters 4 and 5 this particularly interesting possibility is verified.

[18] Data retrieved from COHA on October 11th 2017.

3.2.4 So as to

One of the purpose constructions introducing non-finite clauses. According to OED it is nearly synonymous to *in order to*. Used for same-subject situations. Along with *in order to*, *in order that* and *in order for * to* it belongs to the group of multi-word subordinators (in the classification by Kortmann, 1997: 129). See (7) and (15) for an example sentence.

(15) *Jason..holding out his arms so as to be helped into the tunic.* (OED, s.v. as, adv. and conj., 28: 1990 R. Ludlum *Bourne Ultimatum* xvi. 200)

According to Nykiel (2017: 250) *(so) (as) to* has been the most common non-finite purposive marker in English since the period of Old English. In the OED Online[19] its first attestation is from the year 1450.

The present-day purposive *so as to* seems to occupy the same functional niche in the constructional network as *in order to*, but is judged as less formal by Quirk et al. (1985: 1107) and Swan (2003: 267). It visibly declines in the frequency of use from approximately 1870s (See Fig. 3-5) and its frequency amounts to less than 10 occurrences per million words in 2000s, which is the construction's lowest frequency in the 1800-2000 span.

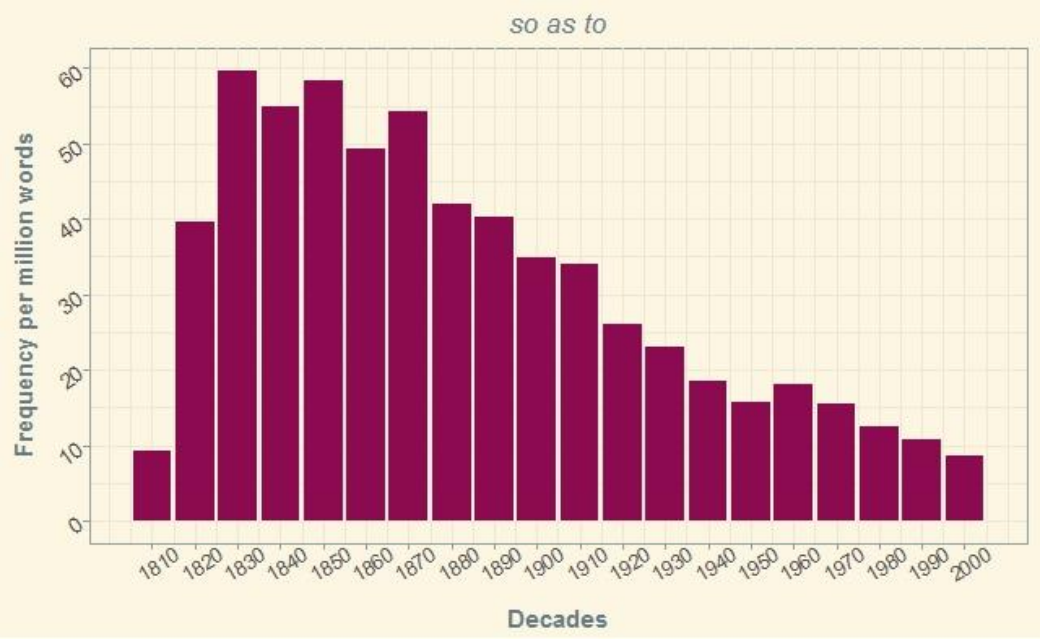


Figure 3-5: Frequency of occurrence of *so as to* across the time period 1810-2009[20].

[19] OED Online, s.v. *as to*, def. 28, retrieved on November 26, 2017 from http://www.oed.com.
[20] Data retrieved from COHA on October 11 2017.

3.2.5 Lest

Lest is the only variant used for the expression of the so-called negative purpose. According to OED *lest* is "used as a negative particle of intention or purpose, introducing a clause expressive of something to be prevented or guarded against". According to Kortmann's classification *lest* belongs to monomorphemic subordinators (1997: 129). This primary morpheme introducing negative purpose is, obviously, not the only way to express an intention that something should be avoided. As Schmidtke-Bode writes (2009: 130):

> Cross-linguistically, it is very common for negative purpose clauses to be expressed in the same way as their canonical positive counterparts, with simply a negative marker being added to the basic proposition (cf. above *will/would + not*).

How long has *lest* been present in the English language? López-Couso (2007: 14) claims that the connective *lest* has been attested in all periods of the history of English. Later on she writes:

> It seems, however, that it was somewhat more popular at the early stages of the language, its resistance to obsolescence having weakened considerably since the beginning of the eighteenth century.

Figure 3-6 shows a marked downward trend in the frequency of occurrence of *lest*. The frequency per million words for the 2000s is low, but not nearly as low as was in the case of *in order that* (see Fig. 3-1).

Schmidtke-Bode (2009: 130) mentions the fact that *lest* is judged as "archaic and very formal" by standard reference grammars (Greenbaum & Quirk 1990: 323). This observation points in the direction of the phenomenon of distributional fragmentation and potential obsolescence.

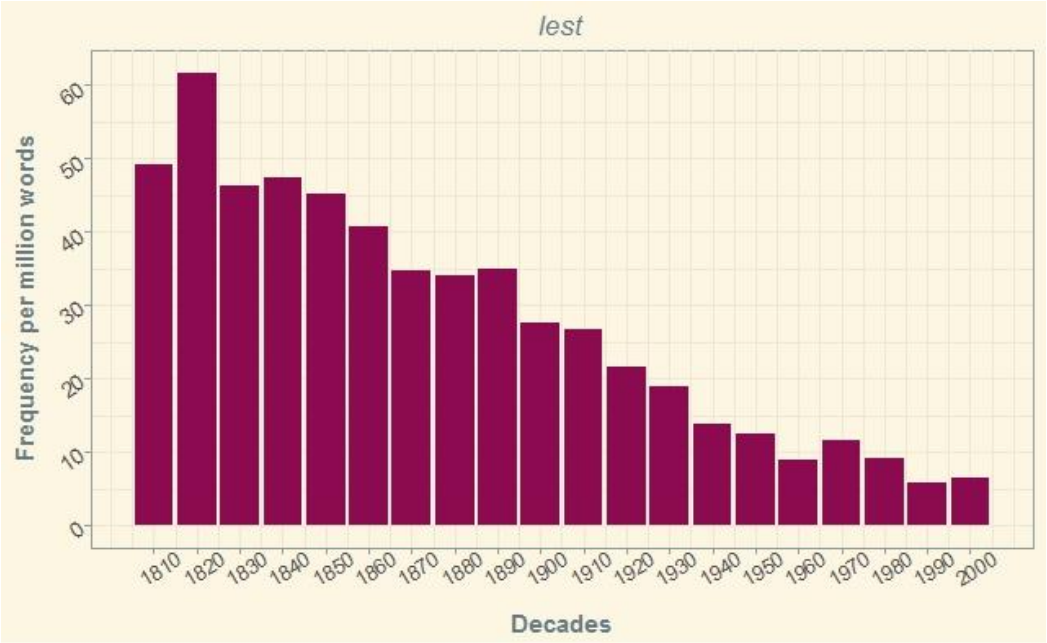


Figure 3-6: Frequency of occurrence of *lest* across the time period 1810-2009[21].

3.3 Written American English as the variety of choice

The language variety studied in the present work is written American English. There are a few reasons behind this choice. Some of the reasons, already mentioned in Section 2.4, have to do with the number and size of large diachronic language corpora of American English, which seem to be a good solution to the problem of data scarcity often associated with the constructions declining in the frequency of use.

Furthermore, there is at least one more thing that makes written American English a good language variety for the investigation of a phenomenon such as grammatical obsolescence, namely the fact that American English is often assumed to be the more "innovative" variety than British English, which is perceived as the more "conservative" of the two varieties (e.g. Norde 2001: 136; Bruckmaier 2017). As Bruckmaier (2017: 32) admits:

> American English is leading the way in many recent developments of grammatical variation (cf. Collins 2009: 284) such as the rise of semi-modals […]. British

[21] Data retrieved from COHA on October 11 2017.

English, by contrast, has been found to be more conservative than American English in a number of recent developments.

Even though treating American English as the innovative variety and British English as the conservative one would certainly be an oversimplification, the fact that American English does seem to be less conservative than British English when it comes to language change, makes it more adequate for the investigation of obsolescence. It does seem plausible that the higher rate of language change and grammatical variation will allow for making more observations in the context of not only emerging language features but also the declining ones.

Moreover, it might be the case that some of the studied constructions exhibit some signs of obsolescence, e.g. a negative correlation between time and the frequency of use, in just one of the varieties, whereas in the other one, they might still present no or very little decrease in frequency of use. This particularly interesting possibility will be looked at in Section 4.5, where a small comparison between British and American written language is offered.

This British-American contrast is interesting also because of the fact that, as Mair points out (2006: 188), "American English is often assumed to lead in the change towards more informal modes of expression in writing". It is hoped that the present work, by focusing on obsolescence, unveils some new facets of the trends of change in American English, and provides some hints at whether any analogical developments may also be taking place in British English.

3.4 Summary

The aim of this chapter has been to introduce the variable which serves as the main subject of the study of the present dissertation and to justify its choice by presenting the first two figures with frequencies of use of *in order that* and *in order to* across time (3-1 and 3-2).

Section 3.1 offers a few insights from the typological research on purpose clauses and situates English among other languages of the world with regard to the purpose clauses used. Some general facts about ways of expressing purpose in English and beyond are also discussed.

Special attention has been given to the distinctions between finite vs. non-finite purpose clauses and balanced vs. deranked purpose clauses.

The main aim of Section 3.2 has been to introduce the variable of purpose subordination as the main subject of investigation. An overview of the different variants looked at in the present work, namely *in order to, in order that, in order for * to, so as to* and *lest*, has been offered. For each of these constructions there is a subsection offering some facts from its history, first attestations and some initial remarks on the frequency of use during the last 200 years, along with visualisations, see Figs. 3-1–3-2 and 3-4–3-6. Table 3.1 offers a short summary of the pieces of information on the particular constructions from Section 3.2.

Section 3.3 concentrates on written American English as the language variety of choice for the present study. The fact that American English does seem to be a more innovative variety than British English (Bruckmaier 2017: 32) and that it is often assumed to be a leader in the change towards more informality in writing (Mair 2006: 188) makes it a promising variety for the investigation of obsolescence.

Construction	**Introducing finite or non-finite clauses?**	**Same subject or different subject situations?**	**First attestation**
in order to	non-finite	same subject	Early 17th century (OED Online)
in order that	finite	different subject	17th (OED Online) or 18th (Kortmann 1997) century
in order for * to	non-finite	different subject	1900s (COHA)
so as to	non-finite	same subject	The middle of the 15th century (OED Online)
lest	finite	same subject and different subject	Attested in all periods of the history of English (López-Couso 2007)

Table 3-1: English purpose subordinators described in Section 3.2 – a short sum-up.

4. Correlations between time and the frequency of use

An hour may destroy what an age was building

The theoretical approach to grammatical obsolescence developed in Chapters 1 and 2 points to the presence of negative correlation between the time and the frequency of use of a given construction as a necessary condition for grammatical obsolescence. The present chapter focuses on looking at the correlations between the frequency and time in the network of purpose subordinators.

However, before proper statistical correlation testing is done, the diachronic developments in the constructional network are visualised and interpreted in the light of the fact that the time frames of the study situate itself at the intersection of two different periods in the history of English, namely Late Modern English and Present Day English.

Additionally, the theory behind the concept of correlation testing is addressed, the different correlation coefficients are introduced and the choice of Kendall's tau as the correlation coefficient which is best suited for use in the context of obsolescence is justified.

The central and most crucial part of this chapter presents the detailed results of correlation testing for the studied purpose subordinators (*in order to*; *in order that*; *in order for * to*; *so as to*; *lest*). The programme of choice for the visualisations and statistical computing is R[22]. The values of correlation coefficients are presented in the form of an easy-to-read table along with their levels of significance. Possible interpretations and implications are offered for the developments concerning each of the investigated constructions.

The final part of the present chapter provides a comparison of the frequency trends in the use of subordinators of purpose between British and American English. Even though for the most part of this chapter, a mega corpus of American English (COHA, containing 400 million words of text) is used, this last section features the use of a set of smaller (1-million-word) corpora belonging to the Brown family. Going beyond a comparison between the abovementioned language varieties, this is a chance to compare the trends

[22]Available at https://www.r-project.org/.

observed in COHA to trends visible in the smaller corpora of American English (B-Brown, Brown, Frown).

4.1 The time frames of the study

This dissertation looks, in the main, at the recent history of English. The studied language variety is written American English (see Section 3.3) and the main corpus used in the investigation is COHA (see Section 2.4) which encompasses the time period between 1810 and 2009. In terms of the history of the English language the year 1810 situates itself in the period of Late Modern English. As Nevalainen states (2006: 1), the dividing line between Early Modern and Late Modern English is the year 1700:

> Three major periods are usually distinguished in its history: Old English (before c. 1100), Middle English (c. 1100-1500) and Modern English (after c. 1500). Many historians divide the Modern English period further into Early Modern and Late Modern English with 1700 as a dividing line.

It is also common that scholars (e.g. Rudanko 1989: 13; Rudanko 1998: 9; González-Díaz 2008), use another dividing line, namely of 1900, to distinguish between the periods of Late Modern English (1700-1900) and Present Day English (1900-until today). Rudanko (1989: 13) refers to twentieth century English as to "contemporary English […] of speakers who are alive today".

To sum-up, in the time period this dissertation looks at (1810-2009), two subperiods may be distinguished, namely a part of the Late Modern English period (in the data represented by the time period from approximately 1800 to 1900) and almost the whole Present Day English period (1900-until today). The studies are conducted both through the whole studied period and through the two subperiods separately. The aim is, apart from concentrating on the study and the description of grammatical obsolescence, to contribute to the better understanding of the similarities and differences between the language of Late Modern English and Present Day English.

4.2 Network of English purpose subordinators: frequency across time

The bar plots in Figs. 3-1– 3-2 and 3-4 – 3-6, which are presented as a collection of plots in Fig. 4-1, already give us an idea about the general developments of the frequency across time.

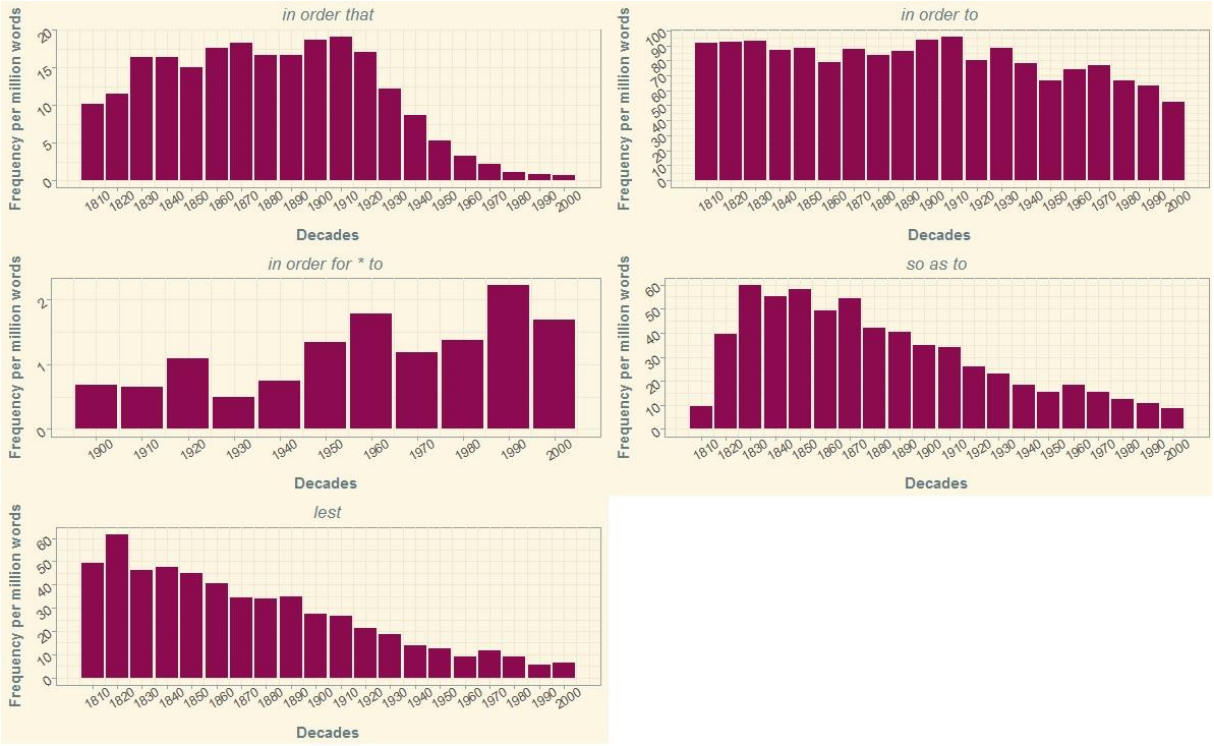


Figure 4-1: Bar plots presenting frequency developments over time for *in order that*, *in order to*, *in order for * to*, *so as to* and *lest* (Figs. 3-1 & 3-2 and 3-4 – 3-6 of the present work).

However, what is still missing is a bigger picture applying the same frequency scale to all of these constructions, which would present the whole constructional network in one plot. This bigger picture would enable direct comparisons between the particular constructions in the context of the frequency developments across time.

The present section addresses this issue. Firstly, a few words have to be said about the data set used to visualise trends of change in the time period 1810-2000. Secondly, the diachronic developments will be visualised, and, thirdly, first interpretations of the trends observed will be offered. The present section provides a step which is necessary (Gries 2013: 154) to get acquainted with the data before any statistical testing, such as correlation testing, can be done.

4.2.1 The data

The data were extracted from Corpus of Historical American English via its online interface. The values which are most interesting in the context of the present study are the normalised (per million words) frequencies of use. Table 4-1 contains the normalised frequencies of use[23] for the five studied constructions. Both positive and negative variants of each construction are included in the data set. Since in the case of non-finite purpose subordinators the negative variants are not added to the results of searches done for the default variant, the default variant being the positive version such as *in order to* and *so as to*, extra searches had to be done to adjust the results appropriately. To give an example, (16) presents a negative variant of the finite construction *in order that*, which is by default included in the frequency results of the construction *in order that*. In the case of *in order to* and *so as to* one would have to insert *not* between the prepositional phrases (*in order* and *so as*) and *to*, like in (17) and (18), to obtain the negative variant.

(16) *In order that they not take her completely for granted, Anouk needled Marianna.* (COHA: 1970; FIC: "Paris One")

(17) *In order not to be misunderstood, I need to be perfectly clear that I believe it is incumbent on us to live our lives in a way that takes into account all the consequences of our actions, including those to other people and the environment.* (COHA: 2000; MAG: USA Today Magazine)

(18) *He would like to fulfill them early on in his term so as not to erode his political capital.* (COHA: 1990; MAG: Time Magazine)

To conclude, in order to provide values for both positive and negative variants of non-finite constructions, two searches have been done for each of the non-finite constructions, one for the positive and one for the negative variant. Afterwards, the results were added. Because of this procedure, the frequency results for e.g. *in order to* cannot be reproduced by a single search in COHA, as is the case for e.g. *in order that*, but by two searches, namely, for *in order to* and *in order not to*. Figures depicting frequency changes presented

[23] Retrieved from COHA on October 20, 2017.

in Chapter 3 (3-1 and 3-2 and 3-4 to 3-6), and the set of plots in Fig. 4-1, also contain the values for both positive and negative variants for all the subordinators. In the case of *in order for * to* there are no frequency values for the time period 1810-1890 since the construction has just entered the core grammar of English in 1900 (see Section 3.2.3).

Decade	**Frequency per million words**				
	in order to	***in order that***	***in order for * to***	***so as to***	***lest***
1810	91.43	10.16	NA	9.31	49.10
1820	92.10	11.55	NA	39.69	61.64
1830	93.36	16.33	NA	59.68	46.17
1840	86.68	16.33	NA	55.02	47.42
1850	88.52	15.06	NA	58.34	45.11
1860	79.04	17.53	NA	49.26	40.69
1870	87.76	18.26	NA	54.30	34.64
1880	83.29	16.59	NA	41.89	34.11
1890	85.97	16.60	NA	40.34	34.85
1900	93.73	18.74	0.68	34.98	27.60
1910	95.72	19.07	0.66	34.06	26.74
1920	79.91	17.07	1.09	26.00	21.48
1930	88.04	12.15	0.49	22.97	18.90
1940	78.24	8.62	0.74	18.56	13.80
1950	66.78	5.34	1.34	15.64	12.55
1960	73.78	3.21	1.79	18.19	8.93
1970	76.50	2.18	1.18	15.41	11.59
1980	66.56	1.15	1.38	12.52	9.09
1990	63.49	0.79	2.22	10.70	5.69
2000	52.32	0.68	1.69	8.56	6.43

Table 4-1: Frequency per million words across the time period 1810-2009.

4.2.2 Visualisation of the general trends

Figure 4-2 presents a visualisation of the frequency data from Table 4-1 in the form of five line plots – one for each of the studied constructions. Each data point represents a normalised (per million words) frequency of use per given decade. The exact time period presented in Fig. 4-1 is 1810-2009.

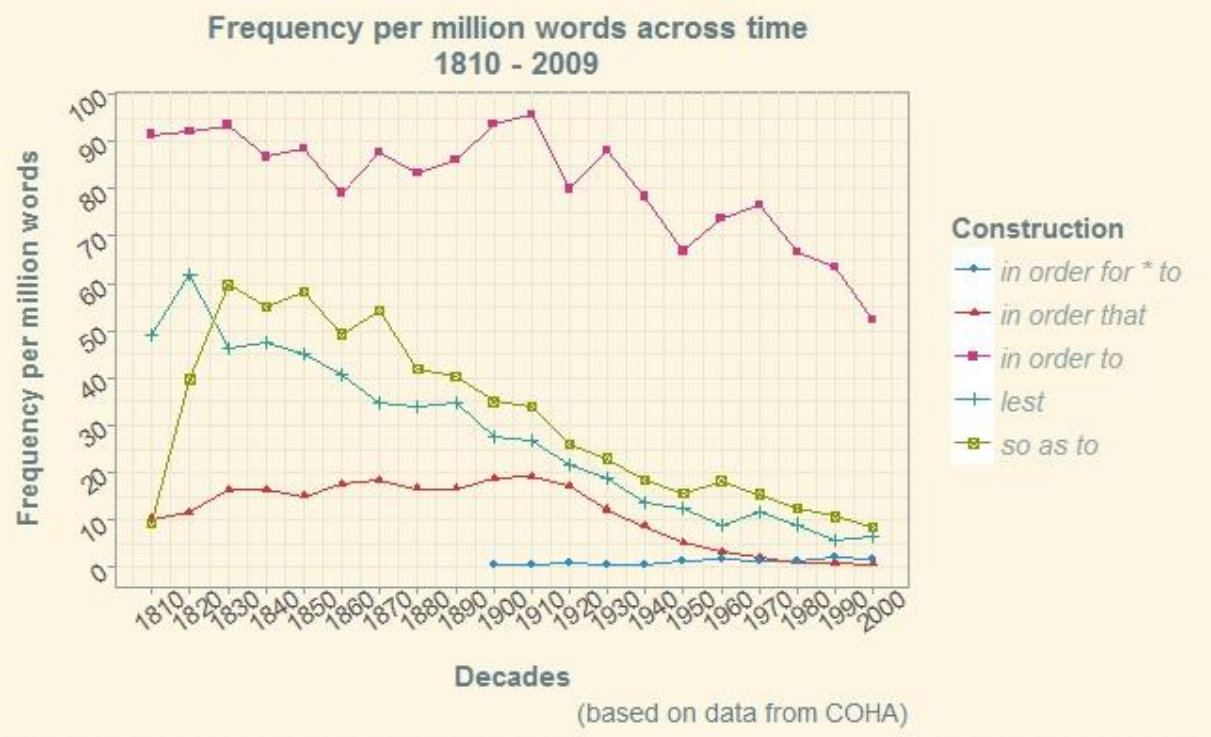


Figure 4-2: Diachronic trends for *order for * to*, *in order to*, *in order that*, *lest* and *so as to* in the time period 1810-2009.

The visual inspection of the frequency curves reveals some degree of an ongoing decrease in the frequency of use in the case of four out of five constructions, namely *in order to*, *in order that*, *lest* and *so as to*. *In order for * to*, on the contrary, seems to present an increase in the frequency of use, but can still be assessed as an infrequent construction, with its highest frequency of use amounting to a little over 2 instances per million words in the decade of 1990. The most frequent of the five constructions is *in order to* which, in the decade of 2000, is almost exactly six times as frequent as the second most frequent construction – *so as to* (52.32 per million words for *in order to* compared to 8.56 for *so as to*). The steepest form of decrease seems to be exhibited by *lest*, but *so as to* seems to follow an almost identical curve, the only difference being that the decrease seems to have started a bit later, namely in 1830. *In order to* seems to be fluctuating until 1900, its frequency

decreasing more visibly from around 1920. The same seems to be true for *in order that* which is shown to be slowly gaining frequency of use until 1910, before suddenly losing almost all of its popularity. Its frequency in 1910 equalled a little bit more than 19 instances per million words, whereas in the decade 2000-2009 it amounted to 0.68.

4.2.3 A close-up perspective: 1900-2009 and 1810-1890

The general trends observed and pointed to in the previous section make it clear that, in the case of all the studied constructions, the beginning of the twentieth century seems to be an important dividing line. For *in order that*, the decrease started around 1910; for *lest* and *so as to*, it continued with much less fluctuations than before; in the case of *in order to* fluctuations in the frequency of use were replaced by a more steady trend of decrease in the frequency. *In order for * to* as such has only come into existence around 1900 and has, since then, been very slowly increasing in the frequency of use. Fig. 4-3 presents a close-up perspective on the frequency developments from the beginning of the twentieth century, a time point which can also be referred to as the beginning of Present Day English period.

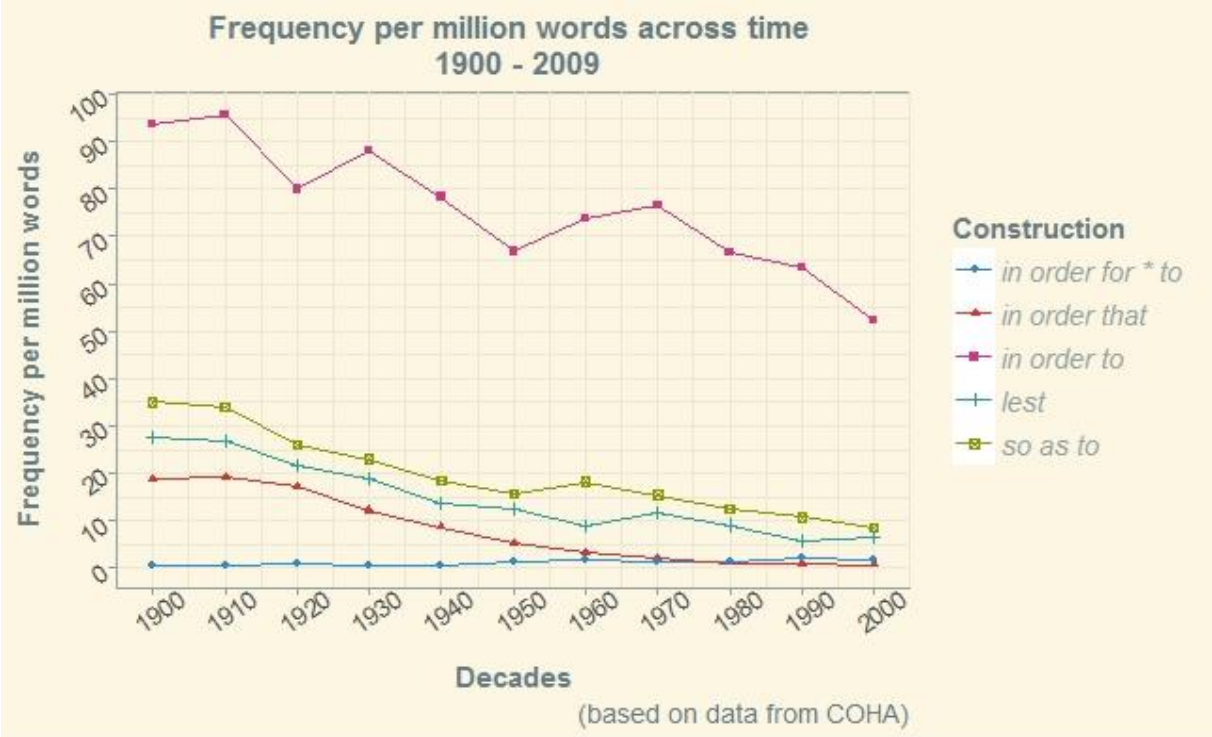


Figure 4-3: Diachronic trends for *order for * to, in order to, in order that, lest* and *so as to* in the time period 1900-2009.

By contrast, a close-up view on the developments from the start of the nineteenth century to the onset of the twentieth century (1810-1890), presented in Figure 4-4, shows a somewhat different picture. Out of five constructions represented in the plot, two (*so as to* and *in order that*) look as if they were increasing in the frequency of use, one (*lest*) is displaying a decrease and one seems to be fluctuating (*in order to*). *In order for * to* is depicted as having a zero frequency of use during the whole period as it only came into existence around the beginning of the twentieth century.

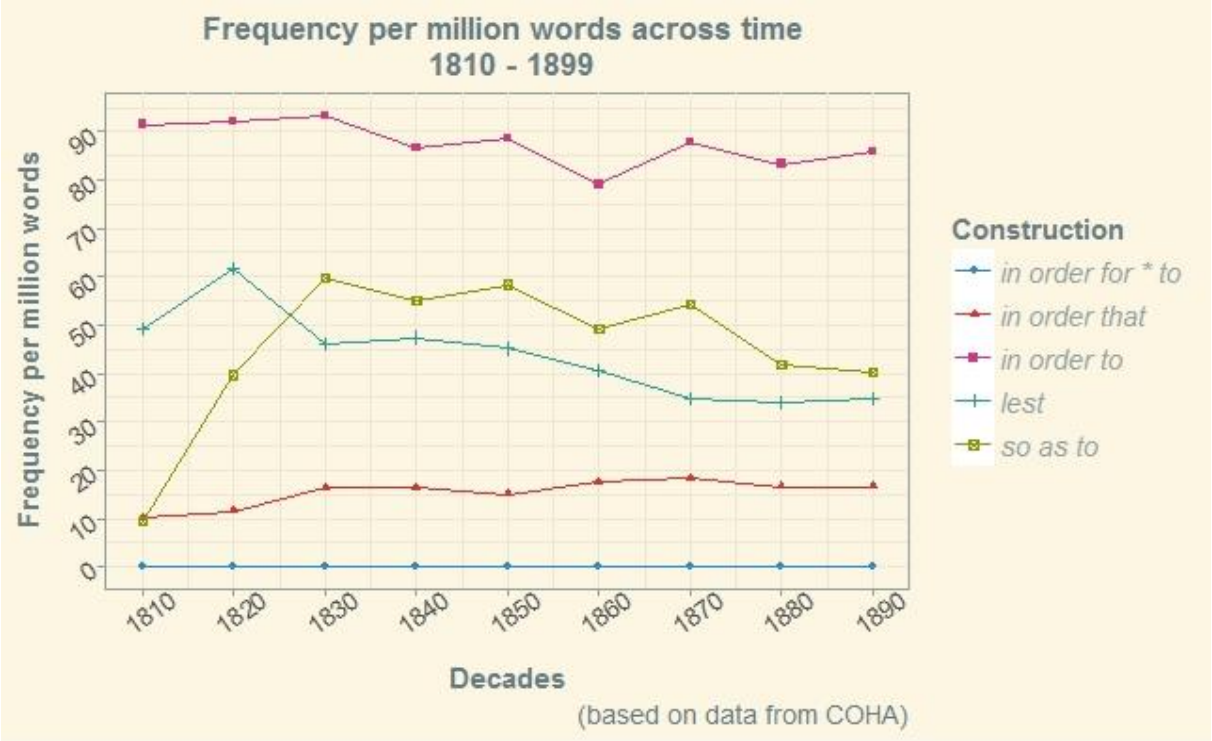


Fig. 4-4: Diachronic trends for *order for * to*, *in order to*, *in order that*, *lest* and *so as to* in the time period 1810-1899.

The English language of the time period of 1810-1890 counts as part of the Late Modern English period, whereas 1900-2009 is referred to as Present Day English. To conclude, the differences in the frequency distribution and evolution of the studied purpose subordinators observed between the two data sets (1810-1890 and 1900-2009) might thus be seen as changes characterising and distinguishing the two periods in the history of English under consideration.

For the majority of the studied constructions there has been some degree of decrease in the frequency of use observed. However, according to the theoretical approach of the present dissertation, the necessary condition for any construction to be seen as potentially

obsolescent is the presence of negative correlation between time and frequency of use. Looking at the downward frequency trends visualised in Figs. 4-2 and 4-3 we might expect some degree of negative correlation. What still has to be done, before proper correlation testing, is the choice and adjustment of statistical methods to make them most useful in the context of language change over time. The next section makes a first step towards this goal by offering a few pieces of information about correlation testing in general.

4.3 A few words about correlations

In statistics, correlation testing is done in order to learn how two different variables are related to each other. The relationship of the studied variables is characterised by two properties measured by correlation coefficients, namely, the *direction* and the *strength* of the correlation.

The *direction* of the correlation is reflected by the sign of the correlation coefficient. It can be either positive or negative. A positive correlation between two variables means that the values of both of them move, on average, in the same direction, which can be paraphrased by "the more…, the more…" (Gries 2013: 148) or "the less…, the less…" statements. Two examples of a positive correlation are provided by Urdan (2010: 79): "on average, the more time students spend studying, the higher their scores are on the test" and "on average, the less time they spend studying, the lower their scores are on the test". A negative correlation between two variables means that the values of both of them actually move, on average, in opposite directions. This relationship could be paraphrased by statements such as "the more…, the less…" or "the less…, the more…". Urdan (2010: 80) provides two examples of a negative correlation, which match his previous examples of a positive correlation, namely, "on average, the more time students spend studying, the lower their scores are on the test" and "on average, the less time students spend studying, the higher their scores are on the exam".

The *strength* of the correlation ranges from -1 to 1. When the correlation coefficient equals 0, there is no correlation between the investigated variables. As Urdan (2010: 80) says:

> A correlation coefficient of .00 indicates that there is no relationship between the variables being examined. That is, scores on one of the variables are not related in any meaningful way to scores on the second variable. The closer the correlation

coefficient to either -1 or +1, the stronger the relationship is between the two variables.

In order to shed more light on possible interpretations of *direction* and *strength* of correlation coefficients, Table 4-2 presents a handy sum-up. The coefficient which is included in the table is Pearson's product-moment coefficient which is also referred to as Pearson *r*. It is one of the most frequently used types of correlation measures (Gries, 2013: 153; Houser, 2014: 34).

Correlation coefficient	Labelling the correlation	Kind of correlation
$0.7 < r \leq 1$	very high	positive correlation:
$0.5 < r \leq 0.7$	high	the more/higher ..., the more/higher...
$0.2 < r \leq 0.5$	intermediate	the less/lower ..., the less/lower ...
$0 < r \leq 0.2$	low	
$r \approx 0$	no statistical correlation (H_0)	
$0 > r \geq -0.2$	low	negative correlation:
$-0.2 > r \geq -0.5$	intermediate	the more/higher ..., the less/lower ...
$-0.5 > r \geq -0.7$	high	the less/lower ..., the more/higher ...
$-0.7 > r \geq -1$	very high	

Table. 4-2: Pearson correlation coefficient and its interpretation (Gries 2013: 147).

Because of the way in which it is computed, Pearson's *r* can only be used with interval[24] or ratio-scaled[25] variables (Gries 2013: 153; Houser 2014: 34). An example of a situation when one could apply *r* is e.g. described in Gries (2013: 147), namely there are two ratio-scaled variables (reaction time in miliseconds and length of a word in letters) and the question is "whether there is a correlation between the reaction times in ms [miliseconds] of second language learners in a lexical decision task and the length of the stimulus words".

[24] A variable is interval when a magnitude of difference between its two values has an informative meaning, but the value of 0 does not. Temperature measured in degrees Celcius is interval because difference in temperatures is meaningful, though 0˚C is defined in an arbitrary way, based on physical properties of water.

[25] A variable is ratio-scaled when a magnitude of difference between its two values and the value of 0 both have an informative meaning. Temperature measured in degrees Kelvin is ratio-scaled because 0 K is defined in an absolute way, being the minimal possible temperature.

However, Pearson *r* correlation coefficient has a few limitations. If a relationship between two variables is non-linear, Pearson *r* will not necessarily provide us with a meaningful description of correlations. Along the same lines, because of the fact that it measures the degree of a linear relationship between two variables, it seems to be rather sensitive to outliers (Gries 2013: 154). Also if the variables do not have a normal distribution, one should refrain from using *r* in correlation-oriented hypothesis testing.

As Urdan claims (2011: 88, 89) there are also so-called specialised versions of Pearson's correlation coefficient which can be used e.g. when one of the variables is interval or ratio-scaled and the other one is a two-level categorical variable (point-biserial correlation coefficient) or when we want to know if two two-level categorical variables are correlated (phi coefficient).

If the two variables are ordinal (data are recorded or re-expressed as ranks[26]), it is appropriate to use rank-order coefficients such as Spearman rho (ρ) and Kendall's tau (τ). According to Urdan (2011: 89) Spearman rho is also a specialised form of the Pearson *r*. It seems, however to be used much less frequently than *r*, as "Pearson *r* is more sensitive to finding significant correlations" (Houser 2014: 34). Chalmer (1986: 200) explains the Kendall's τ coefficient as follows:

> Kendall's tau is another index of correlation that varies from -1 to +1. It, too, is sensitive to monotonicity of any kind, and like Spearman's rho, it works with ranks instead of the original scores. It differs from Spearman's rho in that Kendall's tau considers the degree to which pairs of points are "concordant" or "disconcordant". A pair of points is said to be concordant if the ordering of the two points on the first variable is the same as that on the second variable.

Which of these correlation coefficients are best suited for the present study?

4.3.1 Correlation between time and the frequency of use

Our primary task in this chapter is to test for the presence of correlation between the time and the frequency of use (per million words) for each of the studied constructions.

[26] Data are ranked when they have a natural ordering (are ordinal) and their values are (or have been replaced by) natural numbers corresponding to their positions after ordering. For instance, time of day, an ordinal variable with possible outcomes: "morning", "noon", "afternoon" and "evening", becomes ranked if all occurrences of "morning" are replaced by 1, all occurrences of "noon" are replaced by 2, etc.

The frequency of use is a ratio-scaled variable while time is, generally, by its nature, interval. However, it is usually beneficial (and is always done in the present study) to group the time points together, i.e. split the relevant time period into decades. Since particular decades, when looked at exactly – year by year, can have different frequency profiles, the informative power of differences between decades (also measured in decades) is not full. Still, one can say that between the decade 1810-1820 and the decade 1840-1850 there are three decades of difference, however, this might not be equivalent to the difference of three decades between 1910-1920 and 1940-1950. It is thus assumed here that time measured in decades is an ordinal variable.

Apart from this, the visual inspection of the data set reveals that the dependence between time and frequency (see Figures 4-2, 4-3 and 4-4) is not linear in general. This observation, along with the logic behind the decision to treat time as an ordinal variable, lead us to a conclusion that the rank-order correlation coefficients are a better choice for the investigation of grammatical obsolescence. This means that both Spearman rho and Kendall's tau seem to be equally good for our purpose. However, one of the advantages Kendall's tau has over Spearman rho is its interpretational simplicity, as the coefficient in question consists of the normalised difference between numbers of "concordant" and "disconcordant" pairs. And it is this fact that tips the balance in favour of the use of Kendall's tau correlation coefficient.

4.4 Correlation testing

This section presents some of the theoretical assumptions concerning the frequency developments of constructions in general; the procedure itself and the software used; the results and their possible interpretations in the context of obsolescence.

4.4.1 Obsolescence: history and frequency: some assumptions

As was already stated in Section 4.1, correlation testing will be done for both the whole time period 1810-2009, and the two roughly 100-year periods, namely 1810-1890 and 1900-2009. The idea behind this is to look at both the general trend concerning the whole period illustrated by the COHA data (Table 4-1) and the two subperiods representing Late Modern English and Present Day English.

It is assumed that in the context of potential obsolescence it does not matter how long a given construction has been present in the language. As Kortmann (1997: 303) states in his work on the typology and history of adverbial subordinators:

> [T]here is no need to assume that, in general, the later an item was added to the lexical stock of the language, the greater its chance will be still to form part of vocabulary in the current stage of the language. The facts from adverbial subordinators in Early Modern English prove that it may even be the other way round: the last item to come may be the first to go.

This assumption is considered important, since the network of purpose subordinators contains constructions which differ with regard to their "age". Some have been present in all periods of the history of English, such as *lest* (López-Couso 2007: 14), other entered the language towards the end of the seventeenth century, like *in order that*, or even, like *in order for * to,* in the beginning of the twentieth century.

From a theoretical point of view, it seems natural that if a construction entered the system of core grammar at a given point in time, and shows a strong decrease in the frequency of use at a different given point in time, it must have shown an increase in the frequency between the two previously mentioned points in time, namely its first attestation and the moment in which it already shows a decreasing frequency and popularity.

In the case of the network of purpose subordinators we study (Table 4-1, Fig. 4-2), we can clearly see that e.g. *in order that* was still increasing in the frequency of use throughout the nineteenth century until approximately the 1920, before losing almost all of its popularity (reflected by the frequency of use) in the following six decades. On the other hand, *lest* and *in order to* do not present any initial increase in the frequency of use in the time period depicted in Fig. 4-2, which means that the increase in the frequency of use must have taken place during the earlier period. It might also mean that for e.g. *lest* the decrease might as well have started before 1810. Looking only at the decrease visualised in Fig. 4-2, we do not see what has happened before, though we have an account of López-Couso (2007: 14), who says that *lest*, a construction present in all periods of the history of English, became significantly less resistant to obsolescence around the beginning of the eighteenth century. This might suggest that the decrease in the frequency of use in the case of *lest* might have indeed started even before 1810.

The considerations above, along with the observations made on the basis of Table 4-1 and Fig. 4-2 serve to justify the decision that correlation testing conducted in the present section is done strictly with reference to only the time periods chosen for the study. Whether the constructions are older or younger, or whether they are attested in Present Day English only, or in Middle English as well, does only play a minor role at this point, mainly in the description and interpretation of the results. The attested lifespan of the studied constructions, the length of which may vary, as it does between *lest* and *in order that*, is hence not taken into consideration in the correlation testing itself.

4.4.2 Hypotheses and p-values

For the present study we can formulate the following hypotheses:

Hypothesis 1 (H1): There is a correlation between time and the frequency of use of a given construction in a given time period.

Hypothesis 0 (H0): There is no correlation between time and the frequency of use of a given construction in a given time period.

As Gries (2013: 26) says, one central aspect of a statistical evaluation of the data set is that we do not try to show that the H1 is correct, but we try to show that H0 is wrong. This fact is crucial when it comes to the interpretation of the p-values we get while performing correlation tests.

In the majority of statistical analyses, the *p*-value of 0.05 is treated as the threshold for *significance* of an observed effect. As Gries (2013: 28) says, if the result we get is *significant*, it means that the observed effect (here, the correlation) is large enough for us to assume that, for a given construction in a given time period, there is a correlation between time and the frequency of use (our Hypothesis 1). Furthermore, Gries (2013: 28) points to the fact that even if, due to the results we obtain, we accept Hypothesis 1 it does not mean that Hypothesis 1 is *proven* – "[t]his is because there is still the probability of error *p* that the observed result has come about even though H0 is correct – the probability of error *p* is just small enough to accept H1, but not to prove it."

There are different ways of describing the results depending on the *p*-value. Accordng to Gries (2013: 29):

- *p*-value < 0.001 is sometimes referred to as *highly significant* and indicated with ***;
- 0.001 ≤ *p*-value < 0.01 is sometimes referred to as *very significant* and indicated with **;
- 0.01 ≤ *p*-value <0.05 is sometimes referred to as *significant* and indicated with *.
- 0.05 ≤ *p*-value < 0.01 is sometimes referred to as *marginally significant* and indicated with *ms* or a period.

Gries, however, advises against the use of expression marginally significant, since the *p*-values classified as such are larger than the standard *p*-value of 0.05 which is typically considered as the cutoff for significance.

4.4.3 Correlation testing in R

The programme of choice for the present study is R, a programming language and software environment for statistical computing and graphics[27]. In particular, R is used together with RStudio, a set of integrated tools for R. R is available for download at https://cran.r-project.org/mirrors.html and RStudio at https://www.rstudio.com/products/rstudio/download/.

The present section will not go into all of the technical details concerning the preparation of data for correlation testing, still, some parts of the code and programme's output will be presented.

Correlation testing in R can be performed with the use of cor or cor.test function. These functions test for association/correlation between paired samples. The first one computes the correlation coefficients, whereas the second one returns the correlation coefficient and, additionally, the significance level (or p-value) of the correlation. There are many arguments which one can specify while using cor.test. In the minimalistic version one can just specify two numeric vectors of data value (which have the same length)[28], and the choice of method, which is in our case Kendall's.

The first construction we are conducting the cor.test for is *in order to*. The time period is 1810-2009, the data are presented in Table 4-1. See Fig 4-5 for a screenshot containing the function and output from R.

[27] https://www.r-project.org/.
[28] https://www.rdocumentation.org/packages/stats/versions/3.4.1/topics/cor.test.

```
> cor.test(inorderto$Decade, inorderto$FreqPerMil, method="kendall")

        Kendall's rank correlation tau

data:  inorderto$Decade and inorderto$FreqPerMil
T = 38, p-value = 0.0001025
alternative hypothesis: true tau is not equal to 0
sample estimates:
 tau
-0.6
```

Fig. 4-5: Correlation test output; *in order to*; time period 1810-2009.

According to the output, there is a relatively high (tau = -0.6) and highly significant (*p*-value < 0.001) negative correlation between time and the frequency of use in the case of *in order to*. If we were to interpret this output in the ways Urdan (2011: 80) summarises the results of correlation testing, we could say "the later the decade, the less instances of *in order to* there are".

So even though *in order to* seems to be fluctuating during some parts of the studied period, Kendall's tau test detects the presence of a negative correlation. What if we now only look at the Present Day English period, in our data instantiated by the decades 1900-2009?

```
> cor.test(inorderto$Decade, inorderto$FreqPerMil, method="kendall")

        Kendall's rank correlation tau

data:  inorderto$Decade and inorderto$FreqPerMil
T = 5, p-value = 0.0001323
alternative hypothesis: true tau is not equal to 0
sample estimates:
       tau
-0.8181818
```

Fig. 4-6: Correlation test output; *in order to*; time period 1900-2009.

Figure 4-6 presents the output of the correlation test for the time period 1900-2009 for *in order to*. As we can see, the negative correlation is very high (tau =-0.818) and highly significant (*p*-value < 0.001).

However, for the time period 1810-1890 the result of Kendall's tau test is not statistically significant (Fig. 4-7), or, alternatively, it could be classified as marginally significant (ms) in the terminology presented by Gries (2013, see Section 4.4.2 of the present work), which should not be surprising given the relatively flat curve representing the development of frequency over time in Fig. 4-4.

```
> cor.test(inorderto$Decade, inorderto$FreqPerMil, method="kendall")

        Kendall's rank correlation tau

data:  inorderto$Decade and inorderto$FreqPerMil
T = 9, p-value = 0.07518
alternative hypothesis: true tau is not equal to 0
sample estimates:
 tau
-0.5
```

Fig. 4-7: Correlation test output; *in order to*; time period 1810-1890.

In an analogical manner, Kendall's tau test is performed for the rest of the studied constructions (*in order that*, *in order for * to*; *so as to*; *lest*) and for each of the studied time periods (1810-2009; 1810-1890; 1900-2009).

4.4.4 Correlation testing: results and their interpretation

Table 4-3 presents the results of correlation testing done for all of the studied constructions in the three time periods. In each field containing results we see the value of tau correlation coefficient and the *p*-value with an indication of significance. The pieces of information on correlation testing from Section 4-3 make the general interpretation of the correlation values relatively clear even though according to some works the values of tau and *r* should be interpreted in a slightly different manner. E.g. Helsel & Hirsch (2002: 212) say:

> Tau will generally be lower than values of the traditional correlation coefficient r for linear associations of the same strength (…). "Strong" linear correlations of 0.9 or above correspond to tau values of about 0.7 or above. These lower values do not mean that tau is less sensitive than r, but simply that a different scale of correlation is being used.

This observation, however, should not have an impact on the interpretation of results, since the correspondence between tau and r (for interpretations see Table 4-2) coefficient values, while not perfect, is still strong. Additionally, tau is just one of the results we have, the other ones being the *p*-value and the visualisation of the diachronic frequency trends (Fig. 4-2, 4-3 and 4-4).

Construction	**1810 - 2009**	**1810 - 1890**	**1900 – 2009**
in order to	tau = -0.6 p-value = 0.0001025 ***	tau = -0.5 p-value = 0.07518 *non-significant (or ms)*	tau = -0.8181818 p-value= 0.0001323 ***
in order that	tau = -0.3957797 p-value = 0.01491 *	tau = 0.6111111 p-value = 0.02474 *	tau = -0.9636364 p-value = 5.511e-07 ***
in order for * to	_____	_____	tau = 0.6363636 p-value = 0.005707 **
so as to	tau = -0.7052632 p-value = 2.126e-06 ***	tau = -0.05555556 p-value = 0.9195 *non-significant*	tau = -0.9636364 p-value = 5.511e-07 ***
lest	tau = -0.9263158 p-value = 4.973e-13 ***	tau = -0.7777778 p-value = 0.002425 **	tau = -0.8909091 p-value = 1.373e-05 ***

Table 4-3: Results of correlation testing in R.

The results seem to correspond perfectly to what we see in the visualisations of the frequency trends in Figs. 4-2 – 4.4. The most striking observation which can be made on the basis of Table 4-3 is that in the case of four out of five purpose subordinators (*in order to*; *in order that*; *so as to* and *lest*) we can see very high negative correlation between time and the frequency of use in the time period of 1900-2000. In the case of these constructions the results are highly significant (as indicated by ***). *In order for * to* which only came into being in 1900, shows a very significant positive correlation between time and the frequency of use. The *p*-values visible in the last column of Table 4-3 suggest that the chances that what we observe is not a correlation (so the H0 is true), are very small. Thus, in the case of *in order to*; *in order that*; *so as to* and *lest*, we can accept H1 – and say that there is a correlation between time and the frequency of use. For *in order for * to*, the correlation is positive, which means that the "later the decade, the more instances of *in order for * to* there are". In the case of constructions which show a negative correlation we could say that "the later the decade, the less instances of these constructions there are".

These results can also be interpreted as a presence of a considerable decrease in the frequency of use across time in the period of Present Day English (represented by our data from 1900-2009). In the case of *lest* it seems the decline must have started earlier, as the correlation coefficient and the *p*-value seem to be almost equally high in the time period 1810-1890. The visual inspection of Fig. 4-2 suggests that in the case of *so as to* the decline might have started in 1870 and, in the case of *in order to*, in 1920. *In order that* still presented a statistically significant positive correlation between time and the frequency of use in the time period of 1810-1890 before it started to lose its frequency of use around 1920.

In the whole time period of 1810-2009, four of the construction present a negative correlation between time and the frequency of use, at different levels of statistical significance. However, after the visual inspection of the correlation testing results from Table 4-3 and the visualisations of the frequency trends (Figs. 4-2, 4-3 and 4-4), we can say that the results for 1810-2009 are, very probably, a resultant of the different trends in the two subperiods of 1810-1890 and 1900-2009.

In the light of these results we might also say that time periods of 1810-1890 and 1900-2009 differ to a high extent with regard to the frequency trends concerning purpose subordinators.

4.5 Frequency trends in British and American English: a comparison

The present dissertation looks mainly at the developments in American English. However, as already indicated in Section 3.3, British English will also be looked at in order to provide some comparison between the frequency developments in the two varieties. Another goal of this section is to compare the results concerning the frequency developments we get while using a mega corpus (as represented by COHA) and small well-balanced corpora, represented here by the corpora belonging to the Brown family (see Section 2.4.4 of the present work).

Table 4-4 presents the frequency values for each of the studied construction in three almost equidistant time points for the two language varieties. The values from Table 4-4 are visualised as line plots in Figs. 4-8 and 4-9. The particular time points roughly indicate the year or time period in which the texts included in a given corpus were printed, however, one should avoid referring to them as "exact" time points as e.g. the Brown corpus (1961) contains indeed texts which were printed in the calendar year 1961, but, on the other hand, the BLOB-1931 "is sampled from the period 1928-1934, a window centring on 1931"[29].

As it has been done for the COHA data, see Section 4.2.1, here too, the values for the negative variants of the non-finite constructions (*in order not to* and *so as not to*) were added to the values for the default variants (*in order to* and *so as to*).

Fig. 4-8 presents the frequency developments in American English. We can see that the general frequency trends are very similar to the trends presented in Fig. 4.3 (based on data from COHA). The particular values differ slightly, e.g. in 1931 (B-Brown corpus) there are 137.1 instances of *in order to* (plus *in order not to*) per million words, compared to 88.04 instances in decade 1930 of COHA. On the whole, however, it seems there are more similarities between the data sets than there are differences. One of the striking similarities is the order of frequency of the studied constructions, *in order to* being the most frequent variant, followed by *so as to* and *lest*. *In order that* decreases in the frequency and in the final time point (1991) there are less instances of *in order that* than there are of *in order for * to* – exactly this tendency has been observed in the COHA dataset (see Table 4-1 and Figs. 4-2 or 4-3).

[29] http://www.helsinki.fi/varieng/CoRD/corpora/BLOB-1931/.

Construction	**Frequency per million words**					
	American English			**British English**		
	1931 B-BROWN	1961 BROWN	1992 FROWN	1931 BLOB-1931	1961 LOB	1991 F-LOB
in order to	137.1	103.4	90	150.1	97	100.9
in order that	35.5	7.1	1	21.6	8.1	4
in order for * to	2	2	2	0	0	6,1
so as to	31.46	22.3	14.14	51.4	27.27	23.21
lest	15.23	17.24	10.11	17.4	3	7

Table 4-4: Frequency per million words across the time periods represented by the Brown family of corpora.

Are the same trends visible in British English? As can be seen in Fig. 4-9 the pattern of decrease is not as marked as in the case of American English. Still, there is a decrease in the frequency of use between 1931 and 1961 in the case of *in order to*, *in order that*, *so as to* and *lest*. No instances of *in order for * to* have been found in the two time points representing BLOB-1931 and LOB (1961).

Between 1961 and 1991 the decrease in the frequency of use, although still noticeable, is less steep for *so as to* and *in order that*, whereas in the case of *in order to* and *lest*, we even see some degree of increase. For both *in order to* and *lest* there are 4 instances (per million words) more in 1991 than there were in 1961. In the data for 1991 *in order for * to* is present for the first time and its frequency amounts to a little bit more than 6 instances per million words (this being more than the number of the instances of *in order that* in the same time period).

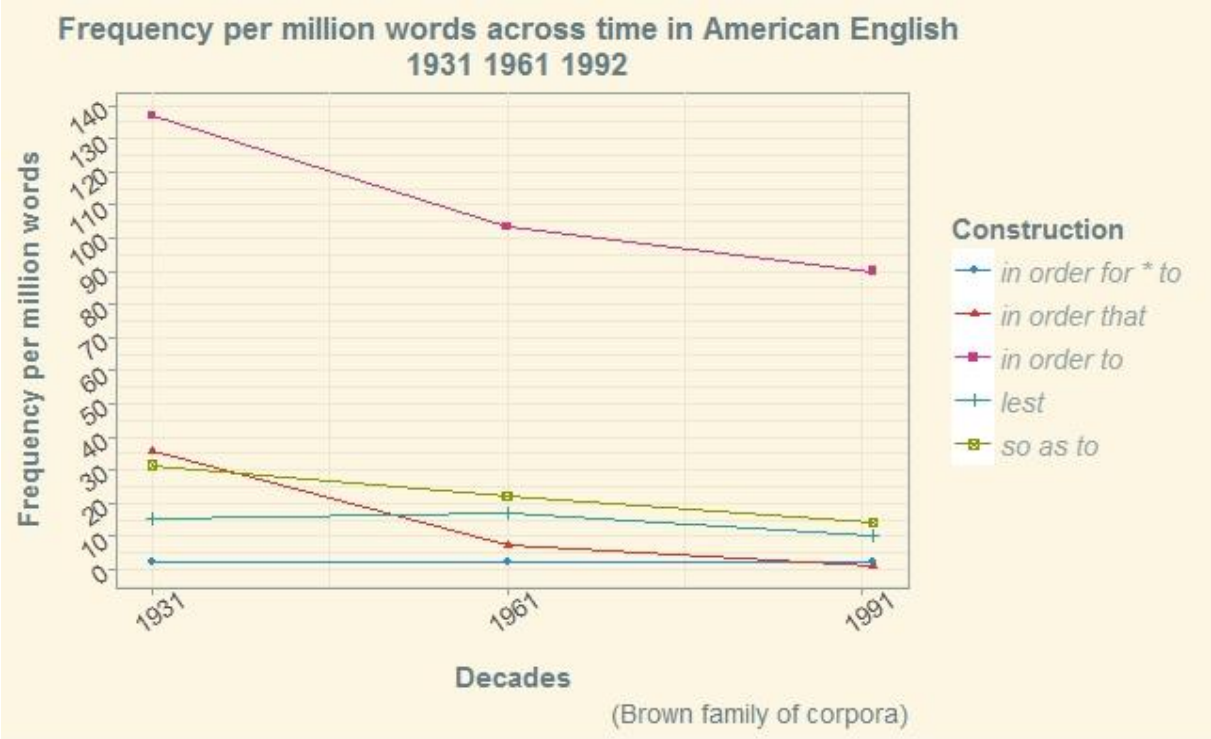


Fig. 4-8: Diachronic trends for *order for * to*, *in order to*, *in order that*, *lest* and *so as to* in American English (1931; 1961; 1992).

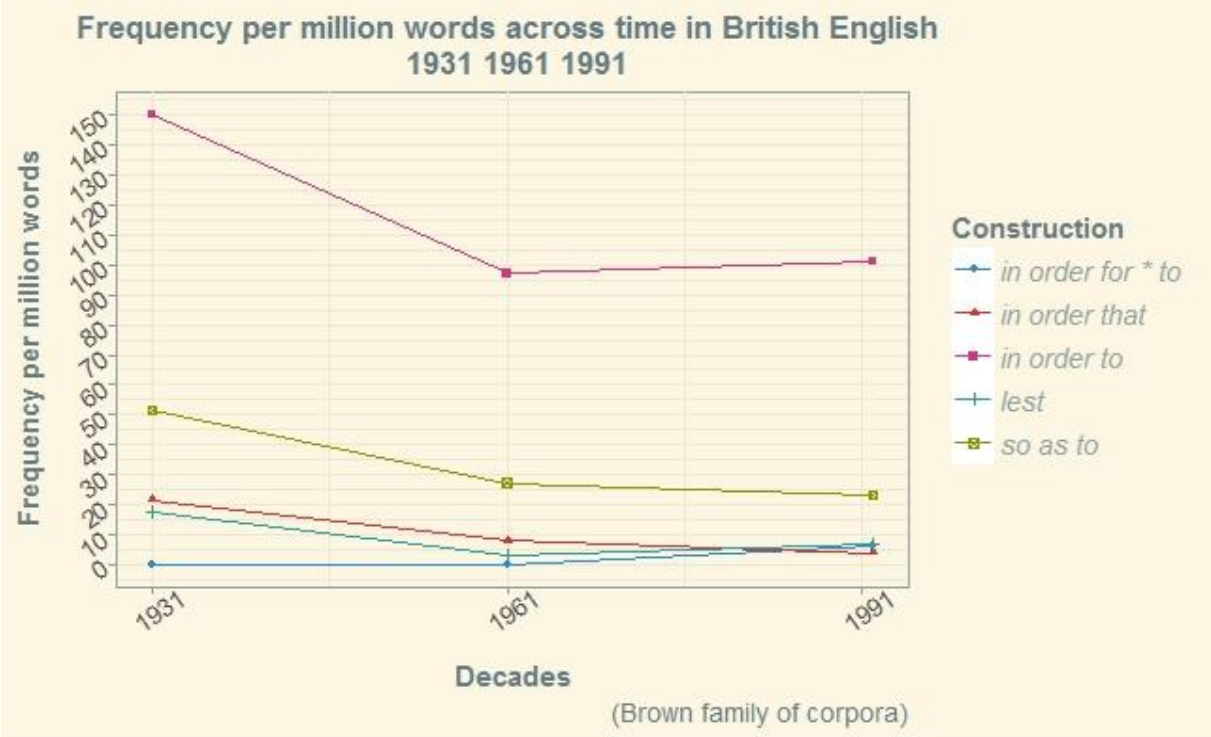


Fig. 4-9: Diachronic trends for *order for * to*, *in order to*, *in order that*, *lest* and *so as to* in British English (1931; 1961; 1991).

Considering these observations, can we say that the trends in American English and British English seem to go in opposite directions?

While there are some signs of differences in the diachronic trends visible in Fig. 4-8 and 4-9, it certainly cannot be said at this point that these developments go in different directions. The most striking frequency developments in the British English dataset can be seen between 1931 and 1961, and these developments are very similar to what can be observed in the analogical period in American English. On the whole, the rate of frequency decrease between 1961 and 1991 seems to generally be slower in British English compared to American English (for the constructions decreasing in the frequency of use). Whether the slight increase in the frequency of *in order to* and *lest* does mean that the 1931-1961 drop was just a fluctuation remains open and should be looked at as soon as there are new members of the Brown family of corpora which would ideally contain texts from around 2021. Or, alternatively, one could use a different diachronic corpus and trace the developments somewhat sooner than in 2020s.

4.6 Summary

If the presence of negative correlation between time and the frequency of use is a necessary condition to consider a construction as potentially obsolescent, four of the investigated constructions (*in order to*; *in order that*; *so as to* and *lest*) do fulfil it (see Table 4-3 and Section 4.4.4). The decrease in the frequency of use is most striking in the time period 1900-2009, however, in the case of at least one of the constructions, namely *lest*, the decrease has very probably started already in the beginning of the nineteenth century or even earlier. *So as to* started to lose its frequency of use in the middle of the nineteenth century. For *in order that* and *in order to* the decrease started in the early decades of the twentieth century.

To sum up, for the period of 1900-2009 there is a (highly significant) negative correlation between time and the frequency of use for *in order to*, *in order that*, *so as to* and *lest*. In the case of *in order for * to* there is a positive correlation observed.

Even though according to both the visual inspection of the Figs. 4-2, 4-3 and 4-4 and the results from Table 4-3 it is clear that the decline in the frequency of use is most marked in the time period 1900-2009, the whole period of 1810-2009 will still be looked at in the rest of this work (see Fig. 2-2, other criteria being e.g. competition or distributional

fragmentation). The assumption behind this is the fact that the developments visible after the beginning of the twentieth century are very likely to have roots in other developments which might have started earlier, such as e.g. the rise of some competing constructions.

The comparison of British and American data (see Section 4.5), conducted with the use of data from the Brown family of corpora, shows that the diachronic developments in the two varieties follow similar patterns between 1931 and 1961, however, the decrease seems to be less pronounced in the British English between 1961 and 1991 and in the case of some constructions previously decreasing in the frequency of use (*in order to* and *lest*) there even is a slight increase in the frequency of use. The trends visualised with the use of Brown family data for the American English bear many similarities with the trends observed in the COHA data.

5. Competition on the lower (constructional) level

Dog does not eat dog

Competition on the constructional level can be defined as a situation in which two or more competing forms exist for the same function and one is eventually selected at the expense of the other(s). It is often listed among the causes for language change in general (e.g. Sweet 1903; Lass 1997; Los 2005; Rissanen 2007; Hundt & Leech 2012; Hundt 2014; Barðdal & Gildea 2015; Traugott 2015; Smirnova 2015), and it is one of the most intuitive causes of obsolescence in language (see Section 1.4 and Fig. 1-7).

The present chapter focuses on competition as a phenomenon possibly accounting for the observed decreases in the frequency of use in the network of purpose subordinators in the time period 1810-2009. Firstly, the prerequisites for treating competition between constructions as a serious cause of change are presented. Secondly, the potential competitors of *in order to*, *in order that*, *so as to* and *lest* are introduced and discussed. Thirdly, the consecutive stages of the investigation of potential competition are shown, together with justifications of the methodological choices and visualisations of results. The chapter ends with a summary painting a bigger picture of the constructional network of subordination of purpose by pointing to larger trends which only become visible after many smaller trends have been investigated, analysed and compared.

5.1 Potential competitors among English subordinators of purpose

As Hundt (2014: 171) has said, there are two prerequisites for competition to be seen as a plausible factor playing a role in an observed language change process. The (potentially) competing constructions have to be functionally equivalent (Lass 1997), and there has to be a direct reflection of competition in the observed frequencies of use of the two (potentially) competing constructions (Hundt & Leech 2012: 176).

Do we see any likely competitors in the network of purpose subordinators? Let us start from the first abovementioned condition and refer to Section 3.1 of the present work, which described some typological aspects of purpose clauses and the distinctions that can be made between different types of purpose constructions. As stated by Schmidtke-Bode

(2009: 199-201), one of the most natural distinctions that can be made is that between finite and non-finite purpose clauses. However, in the context of competition the structural differences between those two types of purpose constructions do not matter as much as the functional ones. As Lass (1997) said, the competitors have to be equivalent with regard to their function, so finite and non-finite purpose clauses should not be seen as direct competitors. According to the typology of Schmidtke-Bode (2009: 200), they can be viewed as complementary, with the latter generally being used in same-subject situations and the former in situations in which the participants have to be made overt (e.g. different-subject situations).

This suggests that e.g. *in order to* and *so as to* cannot be treated as a competitors for the functional niche occupied by *in order that*. On the other hand, competition between *in order to* and *so as to* does seem perfectly plausible. The major problem with the idea of competition between *in order to* and *so as to* is, however, the fact that the second condition mentioned by Hundt (2014) is not fulfilled: there is no reflection of competition between these two constructions in their frequency patterns (see e.g. Figs. 4-2 and 4-3). Both *in order to* and *so as to* present a steady decrease in the frequency of use, at least in the recent decades. Thus, they should not be seen as competitors even though the first condition is fulfilled – they are, to a large extent, functionally equivalent.

A look at Fig. 4-2 and Fig. 4-3 reveals that in the network of purpose subordinators as represented by the five constructions *in order to, in order that, in order for * to, so as to* and *lest*, we only see one pair of competitors, namely, *in order that* and *in order for * to*. They are both used almost exclusively for different-subject situations and the latter shows an increase in the frequency of use just around the same time as the former starts to display a decrease – so the two prerequisites for competition are fulfilled. Section 5.3 looks at the potential competition between *in order that* and *in order for * to*.

One other construction which could be competing with finite subordinators of purpose such as *in order that* is *so (that)*. According to OED Online[30] *so that* is used to denote result or logical consequence and is sometimes used with the same meaning as *in order that*. Since not all of the instances of *so that* have the same purpose-related function as *in order that*, one needs to assess the data in a qualitative way first. Section 5.4 focuses on the purposive *so that* as a potential competitor of *in order that*.

[30] OED Online, s.v. *so that*, retrieved on December 5, 2017 from http://www.oed.com.

What about the same-subject (non-finite) constructions represented by *in order to* and *so as to*? One of the potential competitors is *to*-infinitive, which has a very long history of being used to denote purpose. However, since the purpose-related function is not its only use in the English language, the frequency pattern cannot be depicted as easily as in the case of e.g. *in order to*. It is impossible to simply check for the normalised frequencies of use of the *to*-infinitive across the studied period and draw conclusions from what we see. Decidedly more work needs to be done in order to check whether the purposive context of the use of *to*-infinitive has become more pronounced in the last few decades. Section 5.2 presents a methodological approach to this problem.

When it comes to the competitors of *lest*, they are not that obvious either and not a single potential competitor can be seen in Fig. 4-2. Among the constructions with a similar meaning, there are e.g. the negative forms of *in order to, so as to, so that* and *in order that* along with constructions such as *in case, for fear (that),* or even the verb *to avoid*. Section 5.5 looks for correlations of frequency patterns between *lest* and its functional equivalents.

As a handy sum-up, Table 5.1 presents the pairs/groups of potentially competing constructions, the relation between which is investigated in the present chapter. For each set of competitors the adequate section is indicated.

Function	**Competitors**
Same-subject situations	*in order to* and *so as to* vs. purposive *to*-infinitive Section 5.2
Different-subject situations	*in order that* vs. (*in order) for * to* Section 5.3
Different-subject situations	*in order that* vs. *so (that)* Section 5.4
Negative purpose	*lest* vs. functional equivalents Section 5.5

Table 5-1: Potential competitors in the network of purpose subordinators.

5.2 In order to *and* so as to *vs.* to-*infinitive*

This section aims at answering the question whether *to*-infinitive used in the purposive context competes with *in order to* and *so as to* for their functional niche and can thus, at

least partly, be viewed as the cause for the observed decrease in the frequency of use of *in order to* and *so as to* (see Fig. 4-2 and 4-3).

According to Los (2005: 27) the original function of the *to*-infinitive was that of a purpose adjunct, namely "a constituent that is an adverbial rather than a complement (i.e. it is not an argument of the matrix verb) and expresses an intended result of the action of that main verb". As we already know (see Section 3.2.1), the purpose subordinator *in order to* entered the core grammar of English around the beginning of the seventeenth century, and *so as to* around the middle of the fifteenth century. As Schmidtke-Bode (2009: 174) said, the addition of *in order* in front of the *to*-infinitive might have fulfilled the need for reinforcement after the use of the *to*-infinitive extended greatly during the late Old and Middle English periods. It is thus easy to see that the two more elaborate constructions are secondary to the *to*-infinitive.

Moreover, it seems that at the beginning of their history as subordinators of purpose, *in order to* and *so as to* might have taken over some of the functions expressed by the *to*-infinitive, and one could as well say they were competing with the original variant. However, a few centuries later, the frequency of use of *in order to* and *so as to* is shown to be steadily decreasing. One of the potential causes of what we see might actually be that the purposive *to*-infinitive is now increasing in the frequency of use, thus regaining some of the "purposive territory" occupied in the recent centuries by *in order to* and *so as to*. The following subsections put this hypothesis to the test.

5.2.1 Data and Methodology

To check for the approximate number of the *to*-infinitives used in the purposive context and to check if any increase over time can be observed, the present work proposes the use of a random sample of one hundred *to*-infinitives per each decade from 1810 to 2009 and a qualitative assessment of the contexts in which each *to*-infinitive in the sample is used. The aim of this qualitative assessment is to mark all *to*-infinitives in the samples as having a purposive or a non-purposive context. After all the *to*-infinitives included in the random samples are classified, visualisation of the results can be conducted with an aim of searching for any frequency trends such as e.g. an increase or a decrease in the frequency of use. Each random sample along with the source and genre information is stored for future reference.

The procedure is repeated for each decade and, in the end, twenty random samples, one for every decade in the time period 1810-2009, each containing one hundred *to*-

infinitives, are analysed. As has already been said, the question in the analysis is whether the context in which a given *to*-infinitive is used is or is not purpose-related. The definition of purpose relation by Schmidtke-Bode (2009: 1) is used as basis for the assessment; according to this definition a situation in the matrix clause has to be performed with the intention of bringing about the situation described by the purpose clause. Exemplary sentences in which the *to*-infinitives (underlined) were classified as used in the purposive context are given in (19)-(21).

(19) *One day a handsome, dark, young lieutenant of infantry, Don Edmundo by name, came out to the Cliff House to celebrate his recent promotion*. (COHA: 1870; FIC: "The Fiend's Delight")

(20) *Here and there along the bluff, vast stretches had already been cleared to make way for plantations-to-be*. (COHA: 1950; FIC: "The Tontine, Volume 1")

(21) *A few months into the pregnancy, I wanted to put the house on the market to move to a neighborhood with better schools*. (COHA: 2000; FIC: "The Christmas Shoes")

Among the cases which were not classified as purpose-related there are e.g. *to*-infinitives used to express result or consequence of states and not actions, such as (22) or (23) and all the contexts which clearly do not have anything to do with purpose such as (24) and (25).

(22) *I'm the youngest, you know; the rest of the family were old enough to be weaned.* (COHA: 1890; FIC: "Paste Jewels")

(23) *Yes, we are old enough to remember that color.* (COHA: 2000; FIC: "The Dress Lodger")

(24) *Anybody can see who is going to win, perhaps*. (COHA: 1850; FIC: "The Autocrat of the Breakfast-Table")

(25) *Why did we have to attend?* (COHA: 2000; FIC: "A Rose for the Crown")

If a *to*-infinitive included in the sample happened to be part of one of the investigated constructions such as e.g. *in order to*, like in (26), the case was deleted from the sample and replaced by a new sentence, extracted from a new random sample.

(26) *She didn't need anybody else* <u>*in order to be*</u> *happy.* (COHA: 1990; FIC: "Are you mine?")

5.2.2 Results and Discussion: 100 instances per decade

Table 5-2 presents the results of the qualitative assessment. For every 100 instances of randomly selected *to*-infinitives the majority was used in contexts different than purpose. The number of purposive *to*-infinitives ranges from 4 (in 1820 and 1950) to 15 (in 1960 and 2000). In this subsection, whenever a reference to a *number* of purposive *to*-infinitives is made, it is the raw number in a given sample that is meant, unless otherwise specified. Fig. 5-3 shows a visualisation of results in the form of a bar chart. Each bar represents one COHA decade.

Decade	Purposive	Non-purposive
1810	14	86
1820	4	96
1830	5	95
1840	7	93
1850	8	92
1860	11	89
1870	10	90
1880	8	92
1890	7	93
1900	7	93
1910	9	91
1920	7	93
1930	12	88
1940	10	90
1950	4	96
1960	15	85

1970	8	92
1980	13	87
1990	12	88
2000	15	85

Table 5-2: Number of purposive *to*-infinitives per decade (random sample 100/decade).

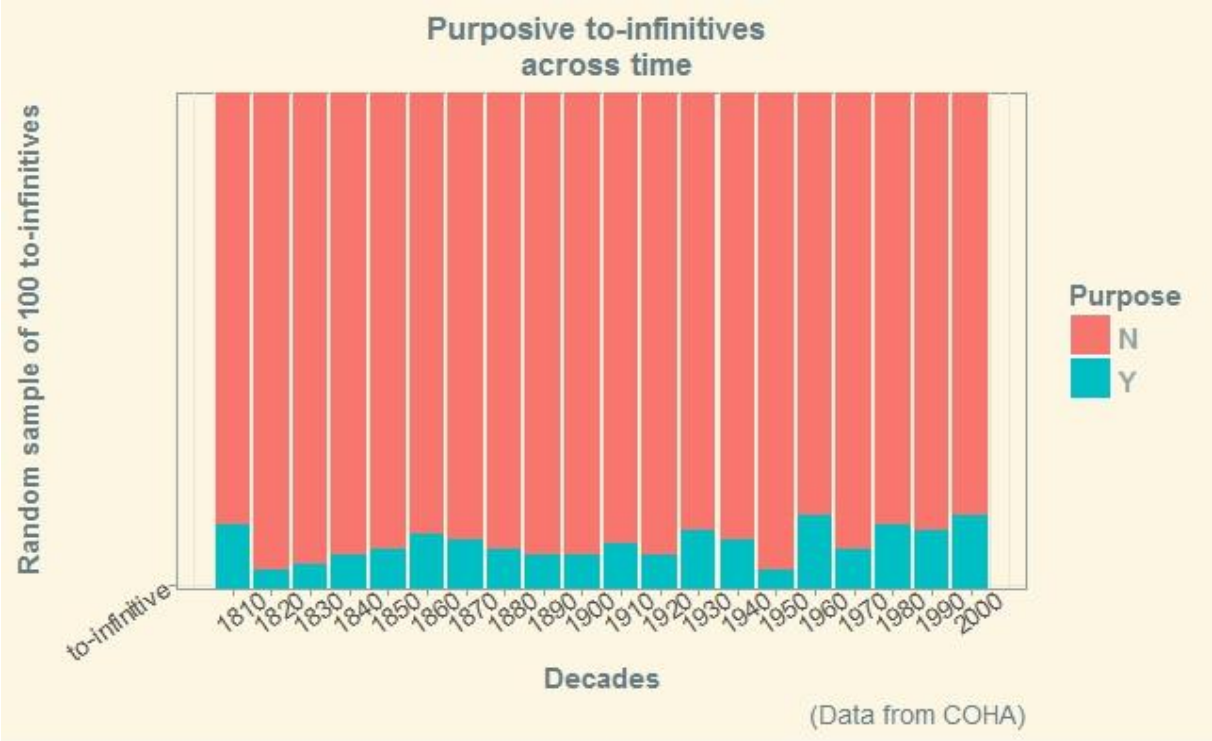


Fig. 5-3: Purposive *to*-infinitives across time; Y (blue) stands for "yes" and N (red) for "no" with regard to the purpose-related context of use.

A visual inspection of the plot does not reveal any stable or marked frequency pattern. The number of purposive *to*-infinitives seems to be fluctuating slightly. There are ups and downs both in the first half of the studied period (1810-1890) and in the second half (1900-2000). It does seem that there are less downs than there are ups from 1960 onwards, but it is hard to say whether this is due to chance or if it already shows a certain tendency.

Thus, the results seem, to a large extent, inconclusive. There are two possible explanations for what we observe. The first possibility is that we do not see any trend because there is none. The number of purposive *to*-infinitives is not increasing or decreasing. There are some small fluctuations but nothing major. The second possibility is that the samples we looked at were too small and maybe we would be able to see more if we analysed more instances of *to*-infinitives. The only way to test for the second possibility

is to look at bigger samples, and to compare the result we get with the result for 100 instances per decade. If no frequency trend can be detected with a bigger sample, it probably means that the first of the two possible explanations is true, namely the number of purposive *to*-infinitives has stayed relatively stable since 1810, which is the beginning of our studied period.

5.2.3 Results and Discussion: 300 instances per decade

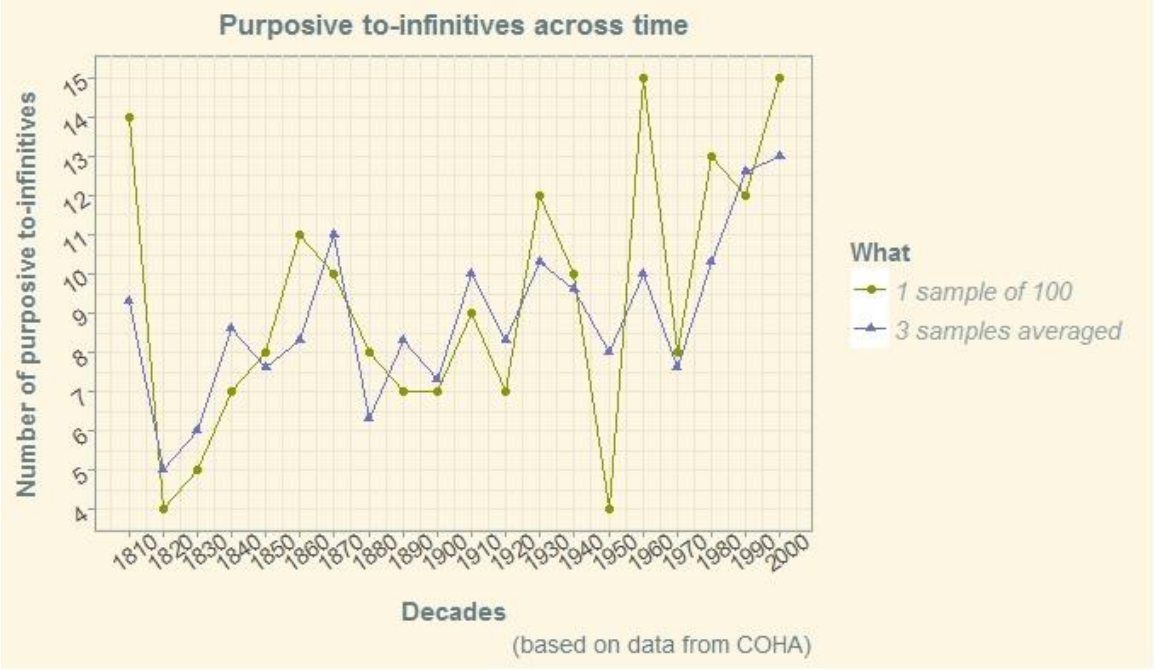
In order to include more data into the picture, two additional random samples of 100 instances per decade were analysed. The selection procedure was the same as before (see Section 5.2.1). In total, more than 4000 new cases were analysed (200 sentences for each decade + replacement sentences if the *to*-infinitive in question happened to be e.g. part of a construction such as *so as to*). The results of the new analysis were then added to the results of the first study and averaged (divided by three, since we had three samples of 100 instances each) to get a number comparable with the results from the first sample of 100 instances per decade only. Table 5-3 presents the results obtained for one sample, for three samples and the averaged result for the total of three samples. "Y" stands for "yes" and "N" for "no" with regard to the purpose-related context of use

Decade	**Y sample 1**	**N sample 1**	**Y per 3 samples**	**N per 3 samples**	**Y averaged per 100 instances**
1810	14	86	28	272	9.3
1820	4	96	15	285	5
1830	5	95	18	282	6
1840	7	93	26	274	8.6
1850	8	92	23	277	7.6
1860	11	89	25	275	8.3
1870	10	90	33	267	11
1880	8	92	19	281	6.3
1890	7	93	25	275	8.3
1900	7	93	22	278	7.3
1910	9	91	30	270	10
1920	7	93	25	275	8.3
1930	12	88	31	269	10.3

1940	10	90	29	271	9.6
1950	4	96	24	276	8
1960	15	85	30	270	10
1970	8	92	23	277	7.6
1980	13	87	31	269	10.3
1990	12	88	38	262	12.6
2000	15	85	39	261	13

Table 5-3: Number of purposive *to*-infinitives per decade – a sum-up.

The first two columns, to the right of the "Decade" column contain the very same figures as Table 5-2, while the next two columns to the right contain the collective results for the three samples of 100 instances per each decade. The final column to the right features the averaged numbers of purposive instances of *to*-infinitives per each decade in the time period 1810-2009. Fig. 5-4 is a visualisation of the results for one sample (second column to the right, Table 5-3) and of the averaged result for three samples (final column to the right, Table 5-3).



5-4: A comparison: 1 sample of 100 instances and 3 samples averaged per 100.

As we can see, the two line plots in Fig. 5-4 seem to follow the same pattern, but the violet line representing the averaged results for the three samples is a slightly smoother version

of the green line presenting the results of one sample of 100 instances. The distances between particular data points are smaller in the case of the violet line plot. The results seem to follow a more or less stable pattern between 1830 and 1970 and a trend of increase in the numbers of purposive *to*-infinitives is still visible in the final decades depicted in the plot for the averaged three samples.

What we have seen in Tables 5-2 – 5-3 and in Figs. 5-3 – 5-4 are the raw numbers of purposive *to*-infinitives per 100 instances and not normalised frequencies per e.g. million words. However, to check whether the second prerequisite for competition is fulfilled, it would be best to use normalised frequencies and then directly compare the diachronic frequency trends of *in order to* and *so as to* with the *to*-infinitive used in the purposive context.

5.2.4 Purposive to-*infinitive per million words*

For a normalised frequency per million words of a *to*-infinitive used in the purposive context, we need the raw numbers of purposive *to*-infinitive per each decade and the already normalised number of all *to*-infinitives, used in all possible contexts, per decade. As the raw number we will use the results for the 3 averaged samples (see Table 5-3, final column to the right). The overall frequency per million words of a *to*-infinitive per each decade is provided by the COHA online interface, after we type "to _v?i*" in the search box and select the chart view. What still needs to be done is the calculation of the fraction of all *to*-infinitives taken by the *to*-infinitives used in the purposive context for each decade.

As an example let us use the decade of 1950. To get a normalised (per million words) frequency of a purposive *to*-infinitive in the 1950 decade we need to take 14519.27 (frequency per million words of all *to*-infinitives in 1950) and multiply it by 0.08 (8% of the averaged sample for 1950 was constituted by *to*-infinitives used in the purposive context). The result is approximately 1161.54. This procedure needs to be repeated for every single decade in the studied time period. Table 5-4 contains the approximate frequencies per million words of purposive *to*-infinitives in the time period 1810-2009.

With these normalised results it is now possible to compare the frequency trends of the three, potentially competing, constructions. Fig. 5-5 contains three line plots, each of them illustrating the diachronic frequency developments of purposive *to*-infinitive, *in order to* and *so as to*. For the exact frequency figures for *in order to* and *so as to* see Table 4-1 (Section 4.2.1).

Decade	Purposive *to*-infinitive per million words	Decade	Purposive *to*-infinitive per million words
1810	1358.62	1910	1496.61
1820	782.68	1920	1194.3
1830	869.37	1930	1482.82
1840	1192.06	1940	1382.41
1850	1122.98	1950	1161.54
1860	1211.65	1960	1463.45
1870	1655.55	1970	1126.584
1880	929.97	1980	1512.82
1890	1194.12	1990	1870.94
1900	1053.88	2000	1899.83

Table 5-4: Normalised number of purposive *to*-infinitives per decade.

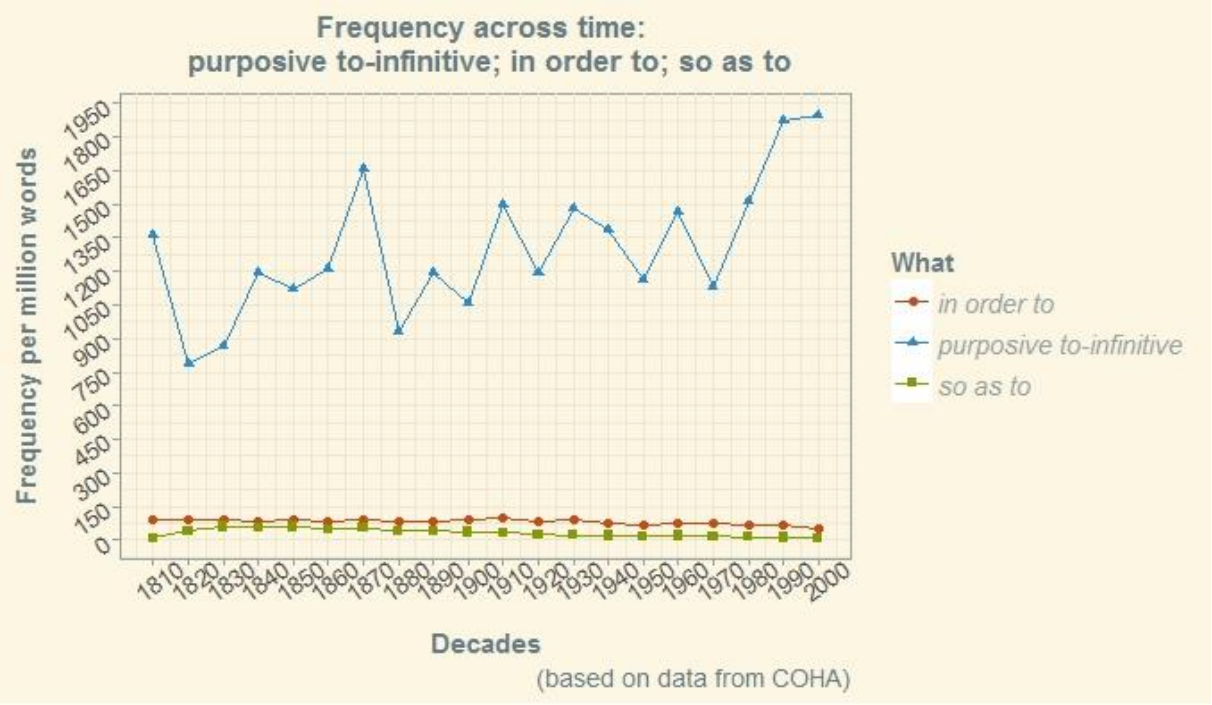


Fig. 5-5: Frequency across time: purposive *to*-infinitive, *in order to* and *so as to*.

What, already at the first glance, seems striking is how big the difference in the frequency of the 3 constructions is. *In order to*, the more frequent of the two more elaborate variants, does not cross the frequency mark of 100 per million words at any point, whereas the purposive *to*-infinitive's lowest frequency is 782.68 per million words (see Table 5-4, decade 1820).

The highest frequency per million words of the purposive *to*-infinitive is 1899.82 which

is 36.3 times the frequency of *in order to* in the same decade (2000). The difference in the frequency ranges occupied by the three variants is so big that the clearly decreasing frequency patterns of *in order to* and *so as to*, visualised in Fig. 5-7, are not visible at all in Fig. 5-5.

Figure 5-6, on the other hand, offers a close-up view for the time period 1900-2009, in which *in order to* and *so as to* show the steepest form of decrease. As was previously the case, the plots for both *in order to* and *so as to* seem to follow a stable, rather than a decreasing frequency pattern.

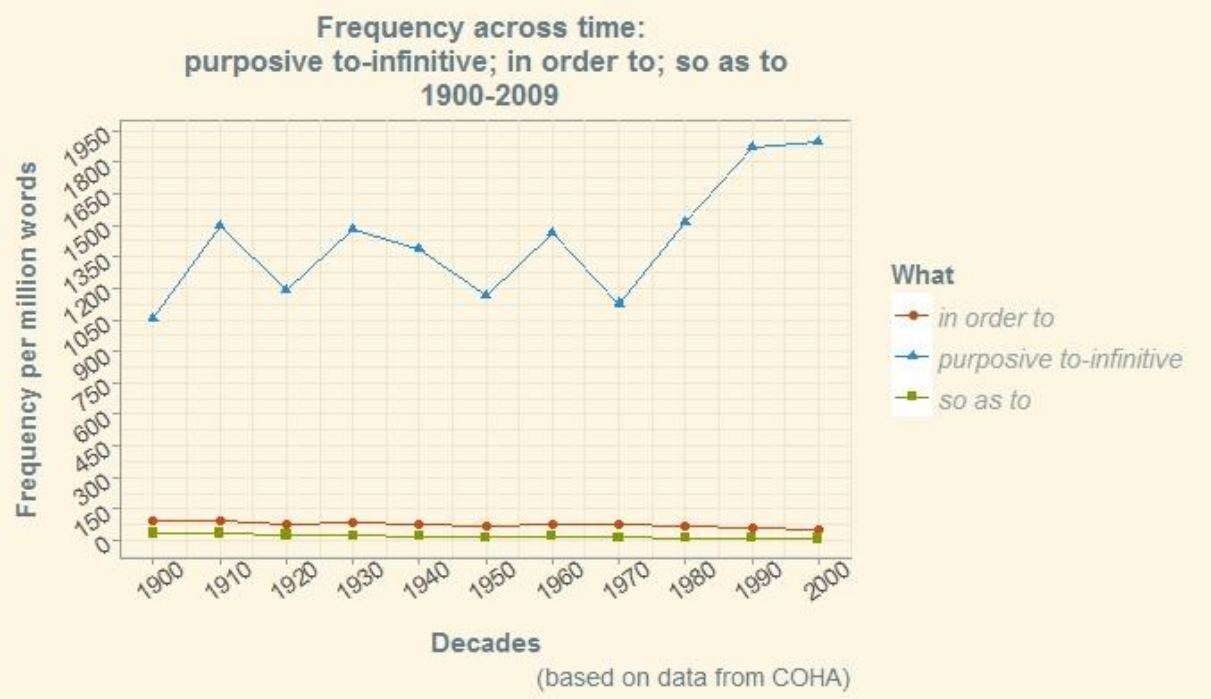


Fig. 5-6: Frequency across time: purposive *to*-infinitive, *in order to* and *so as to*; in the time period 1900-2009.

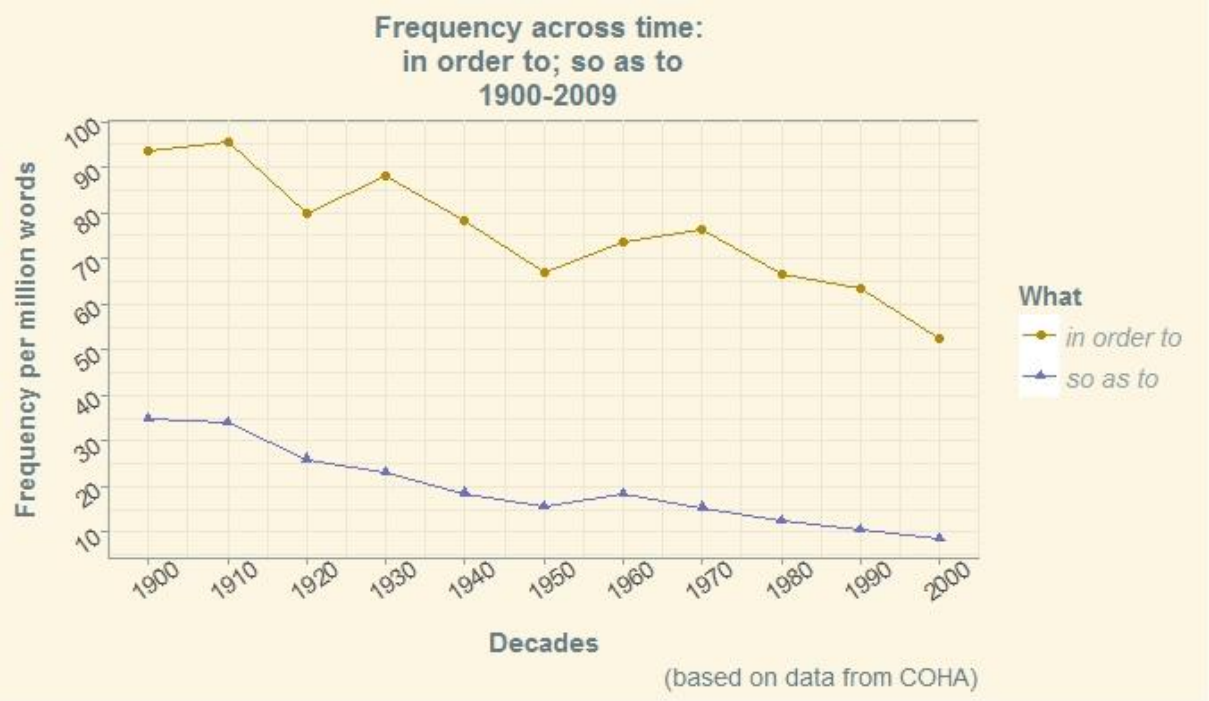


Fig. 5-7: Frequency across time: *in order to* and *so as to*; in the time period 1900-2009.

What about the *to*-infinitive itself? Could an increase in the number of purposive *to*-infinitives be attributed to an increase in the number of the *to*-infinitive as such, in all possible contexts? COHA gives a negative answer to this question, as after typing of "to _v?i*" into the search box of the online interface of the corpus, we get an almost straight line – no major ups and downs in the last 200 years[31].

5.2.5 Conclusions: in order to *and* so as to *vs. purposive* to*-infinitive.*

The frequency of use of *in order to* and *so as to* has been shown (see e.g. Fig. 4-2 or Fig. 5-7) to be visibly decreasing. In the case of *in order to* the rate of decrease was fastest in the time period 1930-2009, for *so as to*, the decrease seems to have started a bit earlier – about 1860. Do we see any reflection of these frequency changes in the frequency of the purposive *to*-infinitive?

First of all, one has to say that the frequency decreases observed in the case of *in order to* and *so as to* are negligibly small when we look at the overall frequencies of the purposive *to*-infinitive. The differences between particular decades are in the case of the purposive *to*-infinitive larger than the highest frequency of *in order to* in the study period. Even if we assume that the results we got for the purposive *to*-infinitive are not exact and,

[31] A search done in COHA on December 27, 2017.

because of all the potential limitations of the method used, may only at best be assessed as approximate, the difference between the share of the purpose-related situations realised by the purposive *to*-infinitive and *in order to* and *so as to* is really huge.

The overall frequency trend of the purposive *to*-infinitive (Fig. 5-5 & 5-6) seems to be going in a slightly upward direction despite the many fluctuations which can be observed on a decade-to-decade basis. However, in the last three decades, namely 1980, 1990 and 2000, there is a definite trend of increase which looks very stable. Correlation testing (Kendall's tau test, see Section 4.4.3) done for the whole period of 1810-2009 yields a statistically significant (p-value = 0.0073) result pointing in the direction of an intermediate positive correlation between time and the frequency of use (tau = 0.431). Could it be that *in order to* and *so as to* lose their frequency of use because of this slightly upward frequency trend of the purposive *to*-infinitive? It might, very likely, be the case. On the other hand, the observed increase in the frequency of use of the purposive *to*-infinitive cannot be explained solely by the decrease in the frequency of use of *in order to* and *so as to*, as it is much larger than the corresponding decrease in the frequency of the studied subordinators.

Table 5-5 presents a sum-up of frequency gains and losses in the case of purposive *to*-infinitive, *in order to* and *so as to* in the last three decades of the studied period. During this time the frequency of the purposive *to*-infinitive seems to have assumed a clearer upward orientation than before and the two studied subordinators reach their lowest frequencies in the whole studied period.

Decade	**Frequency gains and losses; from decade to decade; per million words**		
	purposive *to*-infinitive	***in order to***	***so as to***
1970-1980	+386.24	-9.94	-2.89
1980-1990	+358.12	-3.07	-1.82
1990-2000	+28.29	-11.17	-2.14
In total	+772.65	-24.18	-6.85

Table 5-5: Frequency gains and losses across the time period 1970-2000.

As we can see in Table 5-5, the approximate increase in the frequency observed in the case of purposive *to*-infinitive between 1970 and 1980 is almost 25 times larger than the total decrease of *in order to* and *so as to*. Thus, even if we attribute the decrease in the frequency of use of *in order to* and *so as to* to the increase in the frequency of the purposive *to*-infinitive, this clearly is not the full picture of the changes happening in the functional niche of the relations of purpose. Chapter 8 (Sections 8.1 and 8.2), which focuses on higher-order processes in language, offers possible explanations for the observed developments.

5.3 In order that *vs.* (in order) for * to

The present section focuses on potential competition between two constructions used in different-subject situations, namely *in order that* and *(in order) for * to*. The brackets are used to indicate that, next to the more elaborate version with the syntagm *in order* in front of the *for * to*-infinitive, the shorter variant is discussed as well. However, these two potential competitors of *in order that* are looked at separately. *In order for * to* is investigated in Sections 5.3.1-5.3.3 and *for * to*-infinitive used as an adjunct of purpose in Sections 5.3.4 – 5.3.6.

5.3.1 In order that *vs.* in order for * to

Theoretically, *in order that* and *in order for * to* could be perceived as natural competitors. They both are used in the same functional niche, namely subordination of purpose in different-subject situations (see Sections 3.2.2 and 3.2.3 of the present work), so the first prerequisite for competition suggested by Hundt (2014: 171) after Lass (1997) is fulfilled. Also the second condition, by Hundt & Leech (2012: 176), seems to be, at least at the first sight, met. As could be seen in Figs. 4-2 and 4-3, the former construction started to lose frequency of use just about the same time the latter came into being. Additionally, in the last three decades, *in order for * to* has a higher frequency of use than *in order that*, which might be a strong suggestion as to which one of the two is winning the assumed competition.

5.3.2 A closer look at the frequencies of use

However, a closer look at the frequency developments reveals that the decrease in the frequency of use of *in order that* is much higher than the increase in the frequency displayed by the new potential competitor, *in order for * to*. Fig. 5-8 shows a close-up

perspective on the diachronic frequency changes of the two studied constructions. While the search for the frequency values of *in order that* is relatively simple, *in order for * to* can take a subject of different word length – see (27), (28) and (29) for examples of one-word, two-word and three-word subjects. Thus, in order to maximise precision and recall in the search for *in order for * to*, the input into the search box of COHA was just the pattern "in order for". This pattern, from 1900 onwards, is, in most of the cases, used as part of the purposive construction in question.

(27) *Once this condition of grain size contrast obtains, it is necessary, in order for germination to proceed, that the metal be held at a temperature where the rate of growth of the larger grains is very great as compared with that of the smaller grains among themselves*. (COHA: 1924; NF: "The Science of Metals")

(28) *If I understand it correctly, in order for American companies to operate internationally, there sometimes has to be some bending of local rules, which results in a hybrid market*. (COHA: 1992; MAG: "Going global")

(29) *Clearly, in order for students with disabilities to fully participate in large scale assessments, they must have greater opportunities to learn the content in the general education curriculum and they must have appropriate accommodations to fully participate in the general education curriculum*. (COHA: 2006; NF: "Assessment and Students with Disabilities: Issues and Challenges with Educational Reform")

The frequency patterns visualised in Fig. 5-8 make it clear that even though *in order for * to* seems to have been steadily increasing in the frequency of use, the degree of decrease shown by *in order that* since approximately the time *in order for * to* was first attested, cannot be solely accounted to the occurrence of the new construction. The frequency data used for the plots in Fig. 5-8 are taken from Table 4-1 and were extracted from COHA.

Table 5-6 presents the frequency gains and losses of *in order that* and *in order for * to* in the time period 1900-2009. The reason behind the choice of this time period is the fact that *in order for * to* used as a functional equivalent of *in order that* has only been

attested since the early twentieth century (see Section 3.2.3). Note that the figures in Table 5-6 were obtained by searching for the pattern "in order for" in COHA, so the results contain subjects of various word length, as in (27), (28) and (29), and not only cases with a one-word subject (as the use of single * could suggest). Figure 5-9 presents the visualisation of results.

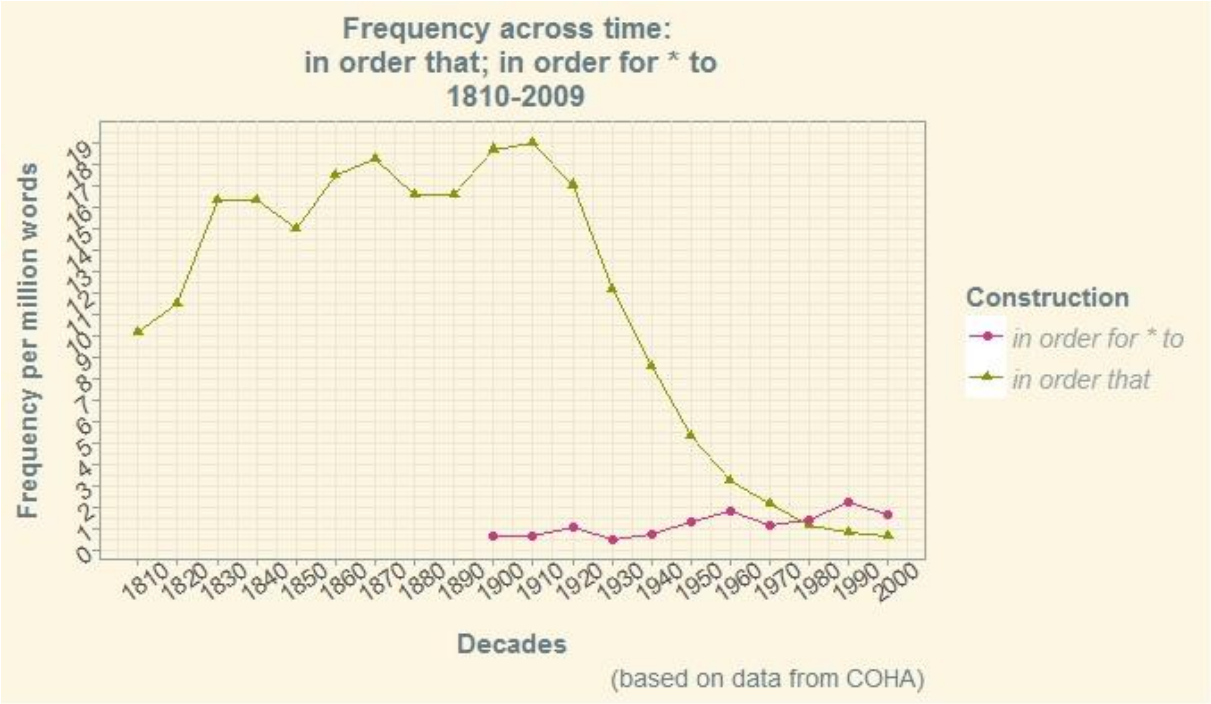


Fig. 5-8: Diachronic trends for *order for * to* and *in order that* in the time period 1810-2009.

Decade	**Frequency gains and losses; from decade to decade; per million words**	
	in order that	***in order for * to***
1900-1910	+0.33	-0.02
1910-1920	-2	+0.43
1920-1930	-4.92	-0.6
1930-1940	-3.53	+0.25
1940-1950	-3.28	+0.6
1950-1960	-2.13	+0.45

1960-1970	-1.03	-0.61
1970-1980	-1.03	+0.2
1980-1990	-0.36	+0.84
1990-2000	-0.11	-0.53
In total	-18.06	+1.01

Table 5-6: Frequency gains and losses across the time period 1900-2009.

According to the results in Table 5-6, throughout this period, *in order that* decreased in the frequency of use by 18.06 (per million words), whereas *in order for * to* displayed an increase by only 1.01. The plots in Fig. 5-9 show that the frequency pattern of the latter construction has also been characterised by fluctuations. It is only in the last three decades of the twentieth century that *in order for * to* seems to have replaced *in order that*. Still, the frequency of *in order that* in these three decades is very low in comparison to its frequency in the early 19th century.

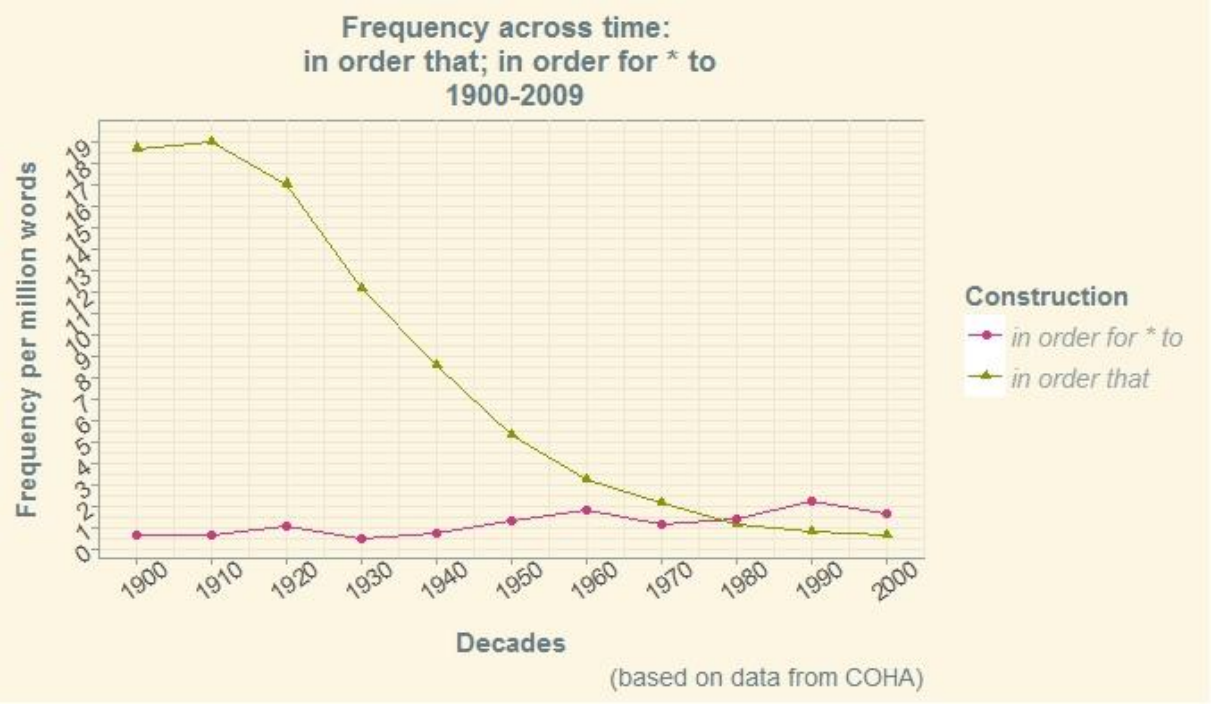


Fig. 5-9: Diachronic trends for *order for * to* and *in order that* in the time period 1900-2009.

5.3.3 In order for * to *as a likely result of diffusional spreading*

As has already been suggested in Section 3.2.3, *in order for * to* might have entered the language as a result of a larger trend in which infinitival clauses with notional subjects introduced by *for* get more popular and frequent, a trend noticed and addressed by Mair & Leech (2006: 336) and De Smet (2013: 79).

*For * to*-infinitives are, next to integrated participial clauses and gerund complements, investigated by De Smet as instantiations of the process of diffusional spreading. In the same work, De Smet (2013: 72) develops hypotheses about the principles of diffusional spreading in the language:

> A new construction establishes a gravitational pole that can attract new items (cf. Krug 2000). Presumably, the more frequent the construction gets, the stronger its gravitational pull, and the more items it can recruit, thus spreading to an ever-growing number of environments. The diffusion to new environments does not occur in an unprincipled way […]. In general, the environments that first "fall victim" to the spreading pattern are expected to be the environments for which the new pattern is most strongly sanctioned, on the basis of existing constructions and their frequencies as well as any other factors that also affect synchronic usage.

Table 5-7 (taken from De Smet) presents the frequencies of use of internally unambiguous *for * to*-infinitives in six different syntactic environments across three historical periods. As we can see, in the early 16th century, the most frequent function of the *for * to*-infinitive was that of a purpose adjunct. The only additional function it had was noun complement. By the early 18th century the construction has started to spread across all the functions included in the table, namely additionally to functioning as an adjunct of purpose and noun complement, it also spread across the following syntactic functions: relative clause, adjunct of comparison, verb complement and subject complement. In the late 20th century *for * to*-infinitives are most frequently used as verb and noun complements, followed by the function of an adjunct of comparison and purpose.

If we take into consideration the fact that the function of an adjunct of purpose has been one of the earliest functions of the *for * to*-infinitive, and since diffusional spreading of syntactic patterns occurs first in environments in which "the new pattern is most strongly sanctioned" (De Smet 2013: 72), the introduction of *in order for * to* in the early twentieth

century might very likely be associated with the diffusional spreading of the *for * to*-infinitives.

The addition of *in order* in front of the *for * to*-infinitive could suggest that the construction has been coined as a more elaborate variant of the *for * to*-infinitive used to convey purposive semantics, with an aim of offering an alternative to the finite *in order that*.

Moreover, the "birth" of *in order for * to* and the subsequent decline of *in order that* could be compared to what Kortmann (1996: 310) says about the use of *that* as a placeholder or as a complementiser and the final element of an adverbial subordinator:

> *[T]hat* as a placeholder or the final element of adverbial subordinator became much rarer and, in some contexts, an obsolete phenomenon in Early Modern English or, at the latest, in Late Modern English (cf. Beal 1988: 50-55). Only in two functions does this complementizer still play an important role for adverbial subordinators in Modern English: as an addition (first obligatory, later optional) to new members of the inventory of adverbial subordinators "recruited" from other syntactic categories; second and far less importantly, as a marker which helped (...) to distinguish between the use of a connective as a coordinator or as a subordinator.

Thus, one might hypothesize that *that* as the final element of *in order that* has never reached the optionality stage, but as the *for * to*-infintives continued to spread across different functional environments, the replacement of *that* with a *for* turned out to be a good option.

Still, one has to note that even though *in order for * to* and purposive *for * to*-infinitive are both used to convey purposive semantics, they are not identical in terms of syntactic integration. Example (30) contains a purposive *for * to*-infinitive which shows a high degree of integration in the sentence. Here, it would not be possible to insert *in order* in front of the *for * to*-infinitive without adding *it* functioning as an object at the very end of the sentence, as in (31).

(30) *Could you bring the baby here <u>for me to see</u>?* (COHA: 1991; Play Script: "Necessities")

(31) *Could you bring the baby here <u>in order</u> <u>for me to see it</u>?*

This tighter integration of *for* * *to*-infinitive in the structure of the sentence might be resulting from the fact that *in order for* * *to* is secondary to it – both in terms of its history in the language and as a rarer and "more elaborate" variant.

Absolute and relative frequencies (per million words) of internally unambiguous *for* ... *to* -infinitves over six syntactic environments in three periods

Syntactic function	1500-1570 (PPCEME)		1710-1789 (CLMET)		1961/1990s (LOB/FLOB)	
	ABS	REL	ABS	REL	ABS	REL
Relative clause	0	0.0	7	2.1	9	4.5
Adjunct of purpose	3	5.2	4	1.2	31	15.5
Noun complement	1	1.7	6	1.8	44	22.0
Adjunct of comparison	0	0.0	18	5.3	29	14.5
Verb complement	0	0.0	1	0.3	90	45.0
Subject complement	0	0.0	1	0.3	15	7.5

Table 5-7: *For* * *to*-infinitives over six syntactic environments (De Smet 2013: 79).

5.3.4 For * to-*infinitive as a competitor of* in order that*?*

The increase in use of *for* * *to*-infinitives in the last few centuries observed by Mair & Leech (2006: 336) and De Smet (2013: 79) also suggests that the purposive *for* * *to*-infinitive itself (without the syntagm *in order* in front) might be competing against *in order that*.

The results obtained by De Smet (2013) and presented in Table 5-7 strongly suggest that some competition between *for* * *to*-infinitive and *in order that* might actually be taking place. *For* * *to*-infinitive has, in the last few centuries, not only spread across different syntactic functions, it also became a more frequent choice in its oldest functions, such as the function of an adjunct of purpose (see Section 5.3.1 and Table 5-7). Still, one has to note that, in his study, De Smet investigated two of the British members of the Brown family of corpora, namely LOB and FLOB, but the construction is said to be more common in American English than in British English (Quirk et al. 1985; Mair 1987: 545) and the trend of increase in the frequency of use across time is without doubt also visible in American English, as presented in Table 5-8 and visualised in Fig. 5-10.

The frequency data presented in Table 5-8 were extracted from COHA via the online interface. There were two searches run, namely "for * to _v?i*" and "for * * to _v?i*" to account for one and two items between *for* and the *to*-infinitive. Note that the figures in Table 5-8 stand for all possible functions and syntactic environments *for * to*-infinitive and *for * * to*-infinitive is used in. Thus, among the results we see are cases such as (32), (33) and (34).

(32) *I pray every night for things to get happier around here.* (COHA: 1979; FIC: "Silver Ghost")

(33) *Brand nodded, finding his head almost too heavy for his neck to move.* (COHA: 1931; FIC: "The Red Hell of Jupiter")

(34) *While looking for things to do in her area to list on her site, she discovered a community band.* (COHA: 2006; MAG: "Freely offering to do something")

Decade	**Approximate frequency per million words**	
	***for * to*-infinitive**	***for * * to*-infinitive**
1810	122.76	99.05
1820	137.72	108.27
1830	115.58	108.17
1840	128.61	107.86
1850	142.61	115.84
1860	154.97	122.49
1870	168.73	128.76
1880	174.84	135.02
1890	166.55	129.41
1900	175.4	136.26
1910	187.31	137.49
1920	173	134.8
1930	175.35	136.25
1940	174.06	136.36

1950	182.28	136.73
1960	173.46	136.38
1970	180.26	136.68
1980	180.32	136.95
1990	202.96	135.39
2000	207.86	136.26

Table 5-8: Frequency of use per million words of *for* * *to*-infinitive and *for* * * *to*-infinitive.

The line plots in Fig. 5-10 representing the normalised frequency of use of the *for* * *to*-infinitive, with one and two items between *for* and the *to*-infinitive show a definite trend of increase. This trend seems to be more marked when there is just one item between *for* and the *to*-infinitive. The frequency of use takes off from the middle of the nineteenth century.

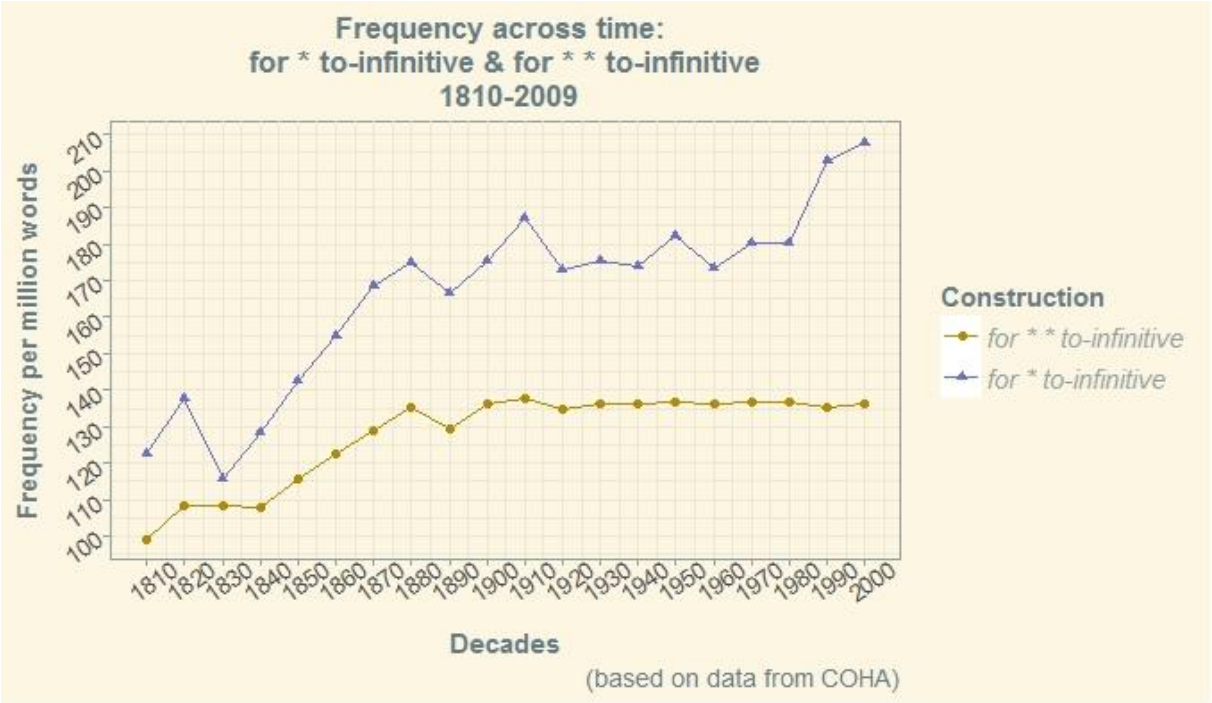


Fig. 5-10: Diachronic trends for *for* * *to*-infinitive and *for* * * *to*-infinitive in the time period 1810-2009.

Given the size of COHA and the tendencies observed by Mair & Leech (2006: 336) and De Smet (2013: 79, presented in Table 5-7) it seems fair to assume that a significant

increase in the number of *for * to*-infinitives is indeed happening, even if among the results there were cases such as (34), which could be eliminated from the data only by a careful qualitative assessment of each case.

5.3.5 Conclusions: in order that *vs.* (in order) for * to

It seems very likely that the rise of *for * to*-infinitive across different semantic functions and its growing popularity can be viewed as one of the causes of the decline of *in order that*. Also, the introduction of the construction *in order for * to* to the English language in the beginning of the twentieth century is probably a result of the rise of *for * to*-infinitives in general. Since the function of a purpose adjunct has always (see Table 5-7) been one of the default functions of this constructional pattern, *in order for * to* might have started its linguistic existence as a more "elaborate" version of a *for * to*-infinitive, the "elaborate" feeling coming from the use of syntagm *in order* in front.

As Mair (1987: 552-553) said "*for + NP + to-inf*. clauses are a full-fledged structural alternative to *that*-clauses in the sense that the former can in principle perform all the syntactic functions of the latter". Given the normalised frequency of use of *for * to*-infinitives, it is more likely that *in order that* is being replaced by the use of *for * to*-infinitive than by the longer variant – *in order for * to*, which is still infrequent and which notes a rather small increase in the frequency of use (see Table 5-6 and Fig. 5-9).

5.4 In order that *vs.* so (that)

Another construction which occupies the same functional niche as *in order that* is *so that*. This construction introduces finite clauses of purpose. Thus, in addition to having the same function, it also shares grammatical features with *in order that*. According to Huddleston & Pullum (2002: 727), *so that* is one of the two subordinators capable of introducing finite purpose clauses in Present Day English (the second one being *in order that*). Huddleston & Pullum emphasise the fact that *that* following *so* can be omitted and in such case the purposive semantics is conveyed only by the means of *so* + finite clause of purpose.

Nykiel (2016: 342) suggests that *so that* is "either explicitly pointed at or only alluded to as a main and most frequent purpose subordinator in PDE [Present Day English]". Additionally, Nykiel (2016: 357) claims that the first function of *so that* was to introduce clauses of result and it took on the function of a purpose subordinator later.

Today, *so that* introduces both clauses of result and purpose. If we want to check whether it competes with *in order that*, and, at least to some extent, accounts for the decrease in the frequency of use of this finite subordinator (see e.g. Fig. 4-2 – 4-3 or Table 5-6), we have to be able to differentiate between *so that* used in the context of result and purpose.

The differentiation between these two functions of *so that* is easier than in the case of the *to*-infinitive or *for* * *to*-infinitive, since, as Schmidtke-Bode (2009: 30) writes:

> [T]he [purpose] clause usually also contains a modal auxiliary, so that the construction is sufficiently different from a result clause, a semantically closely related concept that lacks the purposive characteristics of hypotheticality.

Figure 5-10 contains a schematic illustration of the formal gestalt features of an English finite purpose clause (taken from Schmidtke-Bode, 2009: 30, who adapted it from Croft, 2001: 18).

According to Schmidtke-Bode (2009: 30), the unique constellation of gestalt features (i.e. formal properties) is what makes up a particular construction and differentiates it sufficiently from other constructions in a given language.

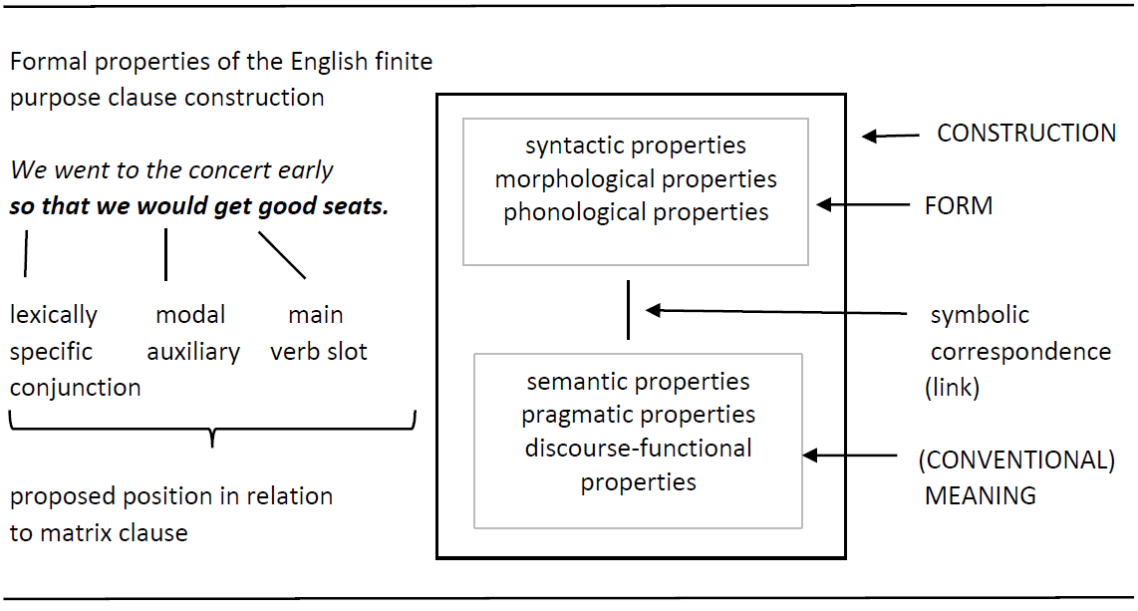


Fig. 5-10: Formal (gestalt) features of an English finite purpose clause (Schmidtke-Bode, 2009: 30, adapted from Croft, 2001: 18).

5.4.1 So that*: Data and Methodology*

The previous section has already pointed at the method of differentiating between *so that* used to introduce clauses of purpose and of result. According to Schmidtke-Bode (2009: 30), a finite purpose clause introduced by *so that* will usually contain a modal auxiliary. COHA gives us a possibility of specifying the pattern we are searching for in great detail. In order to maximise precision and recall we have to conduct at least three searches. In the first search the pattern "so that * _vm*" is typed into the search box of COHA. This gives us all the examples where there is just one word between *so that* and the modal auxiliary. The second search, "so that * * _vm*", differs from the first one with regard to the number of items between *so that* and the modal verb – this time we look for two. Also, a search for "so that * * *_vm" is conducted. The visual inspection of the results of the searches proves that the vast majority of results are indeed clauses of purpose introduced by *so that*, such as (35) – (37), with one lexical item between *so that* and the modal auxiliary, and (38) – (39) with two lexical items in between and (40) with three. Of course we cannot fully exclude the possibility that there is some pollution of the data or that some of the instances would require us to search for even four or five items between *so that* and the finite clause. Nevertheless, since the frequency of relevant instances rapidly decreases with the number of words between *so that* and the modal verb (for e.g. decade 1900: 69.30% is realised by "so that * _vm*", while 20.53% by "so that * * _vm*" and 10.17% by "so that * * *_vm"; these figures being similar for other decades as well, e.g. for 2000 it is 74.95% vs. 16.98% vs. 8.07%) it is hoped that the majority of appropriate instances are included in the data set and that the test is efficient in terms of precision and recall.

(35) *The structure should always be designed so that it can be properly waterproofed, and the waterproofing should always be applied on the side of the wall on which the pressure exists.* (COHA: 1916; NF: Civil Engineering)

(36) *By and by there was to be a party in a neighboring town, and he wrote my uncle telling him his feelings, and asking him to drive me over in his buggy and let him (Barrett) drive me back, so that he might have that opportunity to propose.* (COHA: 1917; MAG: "Mark Twain's letters")

(37) *Those murderers and witches ambushed him in the forest, so that they could take over the throne.* (COHA: 1992; Play Script: "Njinga the Queen King")

(38) *I crossed my hands over them so that the Host wouldn't fall in between*. (COHA: 1976; FIC: "Ratner's Star")

(39) *He pulled over so that his wife could inquire the way to the cemetery, and there were no townspeople of hers to talk to, just men and women, boys and girls.* (COHA: 1983; FIC: "Last respects")

(40) *The frequency was set so that any molecule that might have formed would dissociate into m f = - 9/2 and m f = - 7/2 atoms.* (COHA: 2003; NF: "Ultracold Fermionic Atoms Team up as Molecules: Can They Form Cooper Pairs as Well?")

5.4.2 So that*: Results and Discussion*

Table 5-9 presents the frequency figures for *so that* used as a subordinator of purpose with one, two and three items between the subordinator and the model auxiliary and the frequency of *so that* without any function specified (the query being just "so that"). Figure 5-11 is a visualisation of the data set from Table 5-9 and contains two line plots with frequencies of use per million words. The data were extracted from COHA.

Decade	**Frequency per million words**	
	***so that* (in all contexts)**	***so that* (purposive context)**
1900	179.07	67.65
1910	202.11	77.27
1920	182.39	70.47
1930	200.51	77.06
1940	196.69	79.8
1950	179.96	69.71
1960	170.08	66.14

1970	167.41	68.19
1980	141.69	57.64
1990	129.7	52.32
2000	107.99	43.63

Table 5-9: Frequency across time of *so that* in general and in the purposive context.

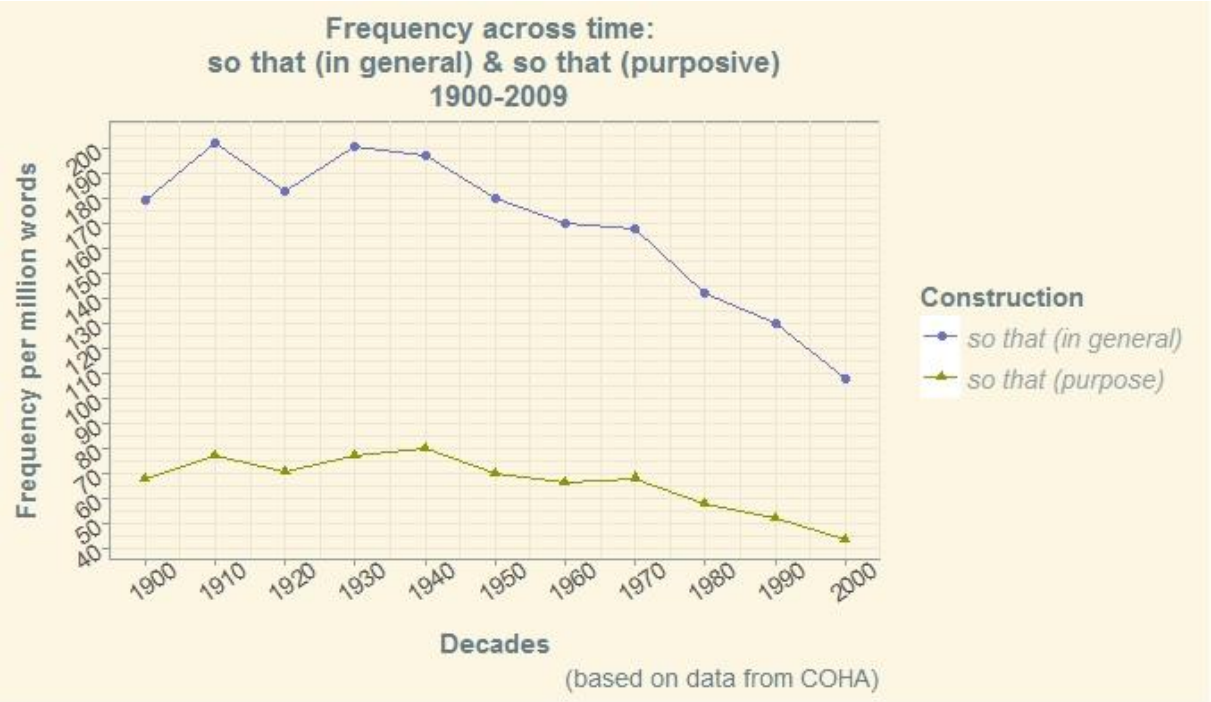


Fig. 5-11: Diachronic trends for *so that* (in general) and *so that* (subordinator of purpose) in the time period 1900-2009.

As we can see in Table 5-9 and Fig. 5-11, both *so that* used in all possible contexts and *so that* used to only denote purposive semantics decrease in the frequency of use. The pattern of decrease is less defined in the case of the subordinator of purpose, however, the highest frequency in the investigated time period is also much lower for this variant, namely 77.27 in decade 1910. The lowest frequency of *so that* used as subordinator of purpose is 43.63 instances per million words in decade 2000. If we take this highest frequency as point of departure, *so that* used as a subordinator of purpose has, by the end of decade 2000, decreased by 33.64 instances per million words, whereas the general frequency of *so that* dropped by almost half (100 instances per million words). According to the data in Table

5-9, *so that* used as a subordinator of purpose shows a steady decrease in the frequency of use and there are no significant fluctuations between particular decades.

5.4.3 Conclusions: in order that *vs.* so that

Even though, at first glance, *so that* seems to be a very plausible potential competitor of *in order that*, it cannot be proved to be one, since there is no reflection of the potential competition between these two subordinators in their frequency developments. Both of them display a decrease in the frequency of use. In the case of *so that* this decrease is less dramatic than in the case of *in order that* (see e.g. Table 4-1 and Fig. 5-8), nevertheless, it still is perfectly observable.

5.4.4 So*: Data and Methodology*

According to Huddleston & Pullum (2002: 727) *that* following *so* can readily be omitted and the purposive semantics realised just by the use of *so* * + finite clause. Also according to OED Online[32] *so* can be used on its own, without *that*, and can denote "result or logical consequence" and sometimes be synonymous with *in order that*, thus fulfilling the functions of *so that*. Could it be that the shorter variant of *so that*, namely *so* * + finite clause is getting more popular with regard to denoting purposive semantics? The following subsections are focused on exploring this possibility.

Purpose clauses with *so that* were relatively easy to determine (see Section 5.4 and 5.4.1). When it comes to *so* * + finite clause, the situation is a little bit more complicated. Even if we applied the principles described by Croft (2001: 18) and by Schmidtke-Bode (2009: 30) to search for the approximate frequencies of use, as we did with *so that*, the results we get this time are not equally convincing.

After typing "so * _vm*", "so * * _vm*" and "so * * * _vm*", we get many purposive results, however in a large number of cases what we see is the construction being used to denote result or logical consequence such as (41), (42), (43) and (44).

(41) *She's twenty-five years old, so she must know everything.* (COHA: 2002; FIC "Bronte's Egg")

[32] OED, s.v. *so* def. 23 retrieved on December 29, 2017 from http://www.oed.com.

(42) *Okay, well, I'm leaving work now so you can try my cell, or just call me at home later.* (COHA: 2004; Movie Script: "The Grudge")

(43) *The park's connecting trails are well-marked with mile markers, so a hike can be as long or as short as you like.* (COHA: 2001; NEWS: Atlanta Journal Constitution)

(44) *Ha ha The baby's fed and dried, so I guess I can kick off my shoes for twenty minutes.* (COHA: 2000; Play Script: "Boy Times Man")

To solve this problem and get at least an approximate picture of the situation, a procedure analogical to what has been done with the *to*-infinitive will be performed (for details see Section 5.2.1). This time 100 random instances of "so * _vm*" in three time points in the time period of 1900-2009, namely 1900, 1950 and 2000, are analysed. The numbers of purposive uses of *so* * + finite clause are then normalised and compared with the general trend for *so* * + finite clause.

5.4.5 So*: Results and their interpretation*

According to the results of the qualitative analysis of the three random samples containing 100 instances of *so* * + finite clause each, which are given in Table 5-10, there seems to be a very marked trend of increase in the number of purposive uses of the pattern. These figures, though, can only be treated as an approximation, as chances are that if we took a bigger sample or e.g. analysed cases in which there were more items between *so that* and the modal verb, we could get slightly different results. Nevertheless, a trend of increase is distinct enough to assume that it would still be there even if we analysed more samples. Figure 5-12 presents the results in a form of stacked bar charts. If we now normalise the results from Table 5-10, we get the approximate number of purposive *so* * + finite clause per million words. The normalisation procedure is conducted identically as in the case of purposive *to*-infinitive (see Section 5.2.4 of the present chapter).

Decade	Purposive semantics	
	Purposive	**Non-purposive**
1900	23	77
1950	39	61
2000	48	52

Table 5-10: Number of purposive *so* * + finite clause in 1900, 1950 and 2000 (random sample 100/decade).

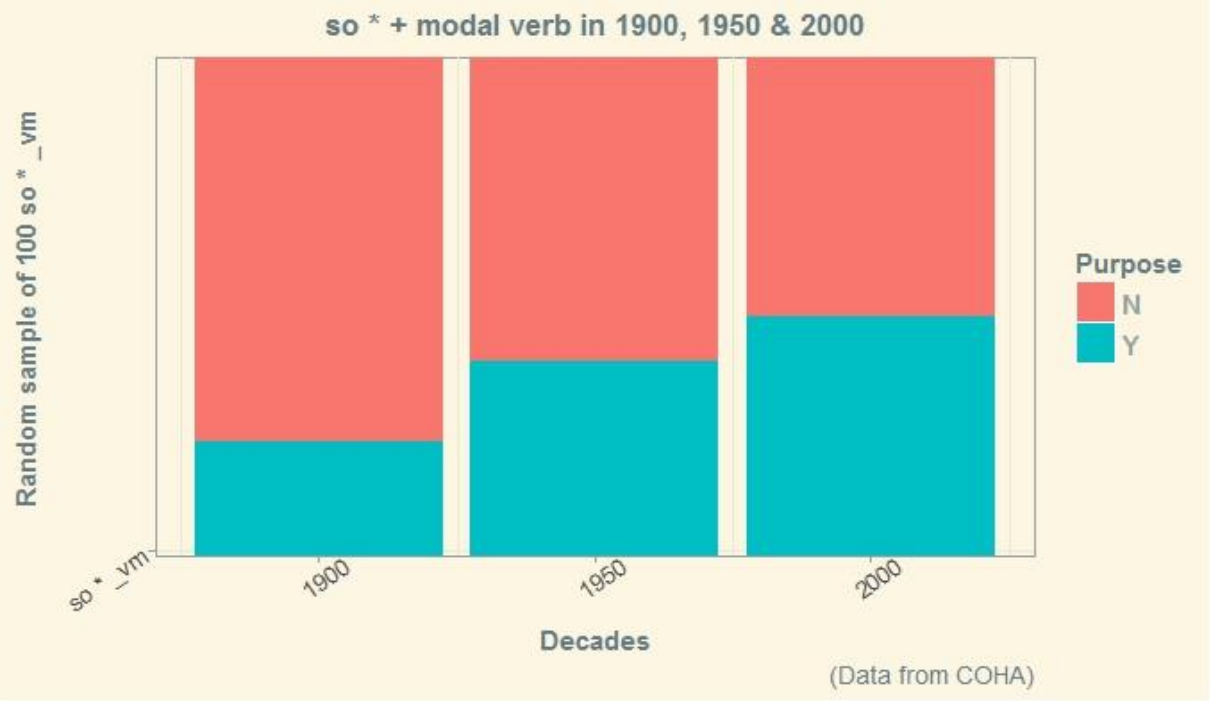


Fig. 5-12: Purposive *so* * + finite clause across time; Y (blue) stands for "yes" and N (red) for "no" with regard to the purpose-related context of use.

Figure 5-13 contains two line plots, one representing the approximate numbers per million words of purposive *so* * + finite clause, the other one representing the frequency per million words of the pattern in general (purposive + all the non-purposive contexts). The figures for the first line plot were calculated with the use of data from Table 5-10 and the frequencies per million words of "so * _vm*" as given by COHA and are included in Table 5-11.

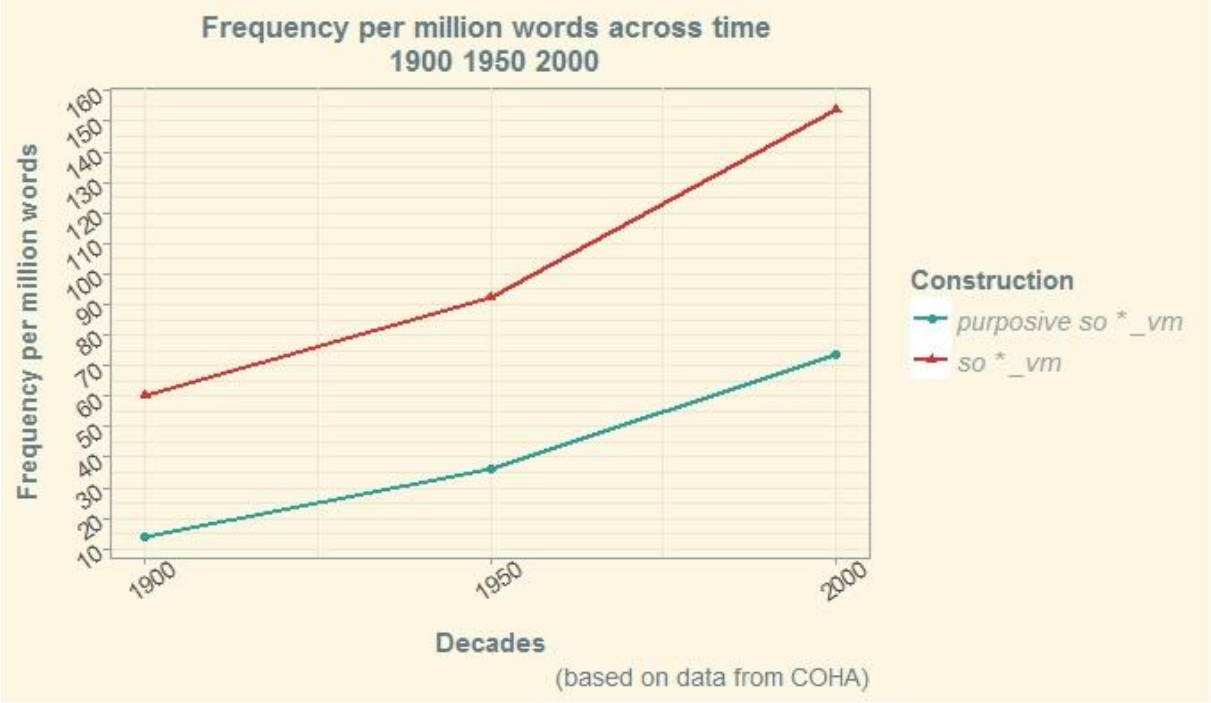


Fig. 5-13: Diachronic trends for *so* * + finite clause (used as subordinator of purpose) and *so* * + finite clause (all contexts) in 1900, 1950 and 2000.

Decade	**So * + finite clause Frequency per million words**	
	Purposive semantics	General results
1900	13.87	60.32
1950	35.99	92.28
2000	73.88	153.92

Table: 5-11: Normalised numbers of purposive and non-purposive *so* * + finite clause in 1900, 1950 and 2000.

As shown in Table 5-11, the normalised frequency per million words of "so * _vm*" used in purposive context increases. However, the pattern *so* * + finite clause as such (in all possible contexts) also shows an increase. This increase seems to be higher between 1950 and 2000 than between 1900 and 1950, but in both 50-year periods it is very

noticeable. Interestingly, the two line plots, one for the purposive and one for the general context, follow an almost identical pattern.

5.4.6 Conclusions: in order that *vs.* so

Quite surprisingly, *so* * + finite clause seems to be the most likely competitor of *in order that*. At the same time one has to note that the decrease in the frequency of use observed for its longer version, namely *so that* might also result from the growing popularity of the shorter variant, especially in the recent decades. As can be seen in Fig. 5-13, the increase in the frequency of *so* * + finite clause is very marked, both in the purposive context, and of the constructional pattern as such, in all possible contexts.

5.5 Lest *vs. "the rest of the world"*

Lest is used to express the so-called "negative purpose", namely an intention to prevent or guard against something. OED Online[33] gives two definitions of *lest* used in Present Day English:

1. a. Used as a negative particle of intention or purpose, introducing a clause expressive of something to be prevented or guarded against; = Latin nē, English that..not, for fear that.

2. Used after verbs of fearing, or phrases indicating apprehension or danger, to introduce a clause expressing the event that is feared; equivalent to the Latin nē, and in English often admitting of being replaced by that (without accompanying negative).

Thus, the frequency results we get if we type *lest* in the search box of the online interface of COHA contain *lest* used in the two abovementioned contexts. Since *lest* in the second context is usually preceded by verbs of fearing, one could check if *lest* preceded by different forms of the word *fear* takes up a large share of the frequency of *lest* used in all its contexts. In order to quickly check for it, we type "fear* lest" into the search box of COHA to get the figures for *lest* preceded by different forms of the word *fear* (e.g. combinations such as *feared lest, fears lest, fear lest*) and compare the results for the general context and the

[33] OED Online, s.v. *lest*, retrieved on December 27, 2017 from http://www.oed.com.

context associated with verbs of fearing. Other words semantically related to *fear* such as e.g. *frighten*, *scare* or *afraid* do not even cross the threshold of 0.5 word per million words in any decade, so only the combination of different forms of *fear* and *lest* is checked for. Table 5-12 sums up the results.

Decade	**Frequency per million words**	
	***lest* preceded by verbs of fearing**	***lest* in general**
1850	3.82	45.11
1860	3.05	40.69
1870	4.79	34.64
1880	3.45	34.11
1890	3.69	34.85
1900	2.9	27.6
1910	2.78	26.74
1920	2.1	21.48
1930	1.46	18.9
1940	0.74	13.8
1950	0.57	12.55
1960	0.25	8.93
1970	0.29	11.59
1980	0.08	9.09
1990	0.07	5.69
2000	0.1	6.43

Table 5-12: Frequency per million words of *lest* in COHA – the two meanings given by OED Online.

As we can see, *lest* preceded by different forms of the word *fear* occupies a rather marginal share of all instances of *lest*, especially in the last few decades. Thus, for the present investigation its general frequency of use per million words will be used.

5.5.1 The potential competitors of lest

In the first definition quoted in the beginning of Section 5.5, OED Online suggests *for fear that* as a potential functional equivalent of *lest*. Ramaswamy (2007: 463) also gives the negative variant of *in order that* and *in case* as synonyms. What other functional equivalents of *lest* are there? The examples (45) – (47) contain *lest* used to denote negative purpose and were retrieved from COHA:

(45) *She hung up in haste, lest her disappointment be audible on the other end of the wire.* (COHA: 1950; FIC: "Cast a Cold Eye")

(46) *" But it's very moving, " Mr. Fish added hastily, lest Dan and I be offended to hear our religion described as " primitive " and " barbaric. "* (COHA: 1989; FIC: "Other Side")

(47) *Then, lest he seem overeager and boyish, James strolled around the corner, looking to kill time, looking for amusement*. (COHA: 2009; FIC: "The brothers Boswell")

Each of these examples could also be potentially reformulated with the use of *in order not to, so as not to, so (that) (not), in order that (not), in order to avoid* or even (in some of the cases) the infinitive *to avoid*. Examples (48) – (51) contain some of the possible reformulations of (45) – (47):

(48) *She hung up in haste, so (that) her disappointment would not be audible on the other end of the wire.*

(49) *" But it's very moving, " Mr. Fish added hastily, in order that Dan and I would not be offended to hear our religion described as " primitive " and " barbaric. "*

(50) *Then, so as not to seem overeager and boyish, James strolled around the corner, looking to kill time, looking for amusement*.

(51) *Then, (in order) to avoid seeming overeager and boyish, James strolled around the corner, looking to kill time, looking for amusement*.

To summarise, we have the following potential competitors of *lest*: *for fear (that)*; *in order that (not)*; *in case*; *so (that) (not)*; *so as not to*; *in order not to*, *in order to avoid* and the infinitive *to avoid*. Since we already know that *in order that* and *so that* decrease in the frequency of use (see e.g. Sections 5.3.2 and 5.4.2), we will not look at these two at this stage, the same deals for *so* (without *that*), which was shown to increase in the frequency of use (see Section 5.4.7).

5.5.2 Lest *and potential competitors: the frequency trends*

Since the constructions selected in the previous section can be treated as functional equivalents, the first prerequisite for competition by Lass (1997) is fulfilled. The next thing that needs to be looked at is whether there is any reflection of a frequency increase between the potential competitors (Hundt & Leech 2012). Table 5-13 presents the data and Figure 5-14 shows the visualisation of the frequency patterns.

Decade	**Frequency per million words**						
	lest	***for fear (that)***	***in order not to***	***so as not to***	***in case***	***in order to avoid***	***to avoid***
1810	49.1	17.78	0	1.69	23.7	3.39	48.26
1820	61.64	8.95	0.72	1.15	21.51	1.44	40.56
1830	46.17	10.6	0.44	2.18	24.76	2.18	37.82
1840	47.42	9.53	0.25	2.87	21.68	1.37	31.53
1850	45.11	12.63	0.91	2.85	20.76	1.64	30.78
1860	40.69	12.55	1.06	3.17	28.14	0.59	25.97
1870	34.64	12.77	0.97	3.23	26.07	2.05	29.04
1880	34.11	10.39	0.74	3.1	29.34	1.58	27.27
1890	34.85	12.14	0.92	2.57	31.89	1.55	25.73
1900	27.6	11.22	1.86	2.49	23.17	2.13	26.79
1910	26.74	10.75	1.32	3.44	25.37	1.72	29.21
1920	21.48	10.41	1.64	2.26	27.68	1.52	26.9
1930	18.9	10.04	1.46	2.97	27.88	2.48	33.74
1940	13.8	9.49	1.11	3.24	25.01	1.72	34.13

1950	12.55	7.46	1.39	4.64	24.93	1.22	37.12
1960	8.93	8.17	0.88	3.63	21.94	1.75	41.79
1970	11.59	7.64	0.88	4.53	25.11	1.55	46.86
1980	9.09	7.54	0.71	3.91	19.67	1.66	47.44
1990	5.69	5.73	0.89	4.76	22.26	1.43	45.74
2000	6.43	5.72	0.37	3.72	26.75	1.05	48.26

Table 5-13: Frequency of use of *lest* and its potential competitors in the time period 1810-2009.

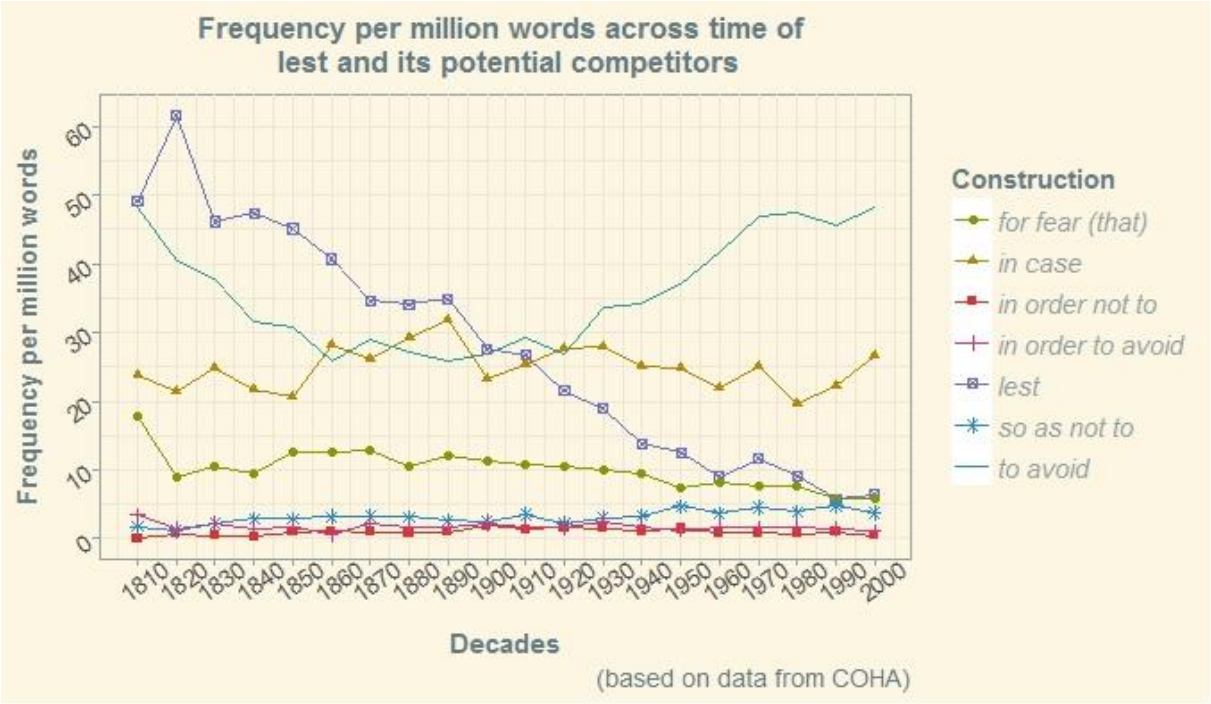


Fig. 5-14: Diachronic frequency trends for *lest, for fear (that), in case, in order not to, so as not to, to avoid* in the time period 1810-2009.

The frequency patterns visualised in Fig. 5-14 show that out of all six potentially competing variants included, only the frequency of the infinitive *to avoid* seems to, at least to some extent, reflect the decrease displayed by *lest*, still, this development is only true for the twentieth century, since throughout the nineteenth century the frequency of use of *to avoid* drops down, a trend which is reversed in the early twentieth century. None of the other constructions plotted in Fig. 5-14 seems to note an increase marked enough to consider it a serious competitor of *lest*.

5.5.3 Conclusions: lest *vs. potential competitors*

The trend of increase visible for the infinitive *to avoid* might suggest that *lest* is replaced by the use of a structurally simpler construction, namely an infinitive of a verb which by itself means "to stay away from someone or something[34]" and "to prevent something from happening or to not allow yourself to do something[35]". However, to treat this frequency trend as a simple competition and replacement situation would be an oversimplification, since the reasons for the big frequency fluctuation of *to avoid* during the nineteenth century are not clear. Additionally, the decrease in the frequency of *to avoid* between 1820 and 1900 follows almost exactly the same pattern as the one displayed by *lest*.

Since we also know that *so* * + finite clause denoting purpose does increase in the frequency of use (see Section 5.4), we might as well assume that this increase encompasses cases in which *so* * + finite clause is used to denote "negative purpose" such as (52) and (53).

(52) *Then I kill some more cows and cut them up into pieces, and some pigs and some sheep and pack' em up carefully so they won't spoil.* (COHA: 1940; FIC: "In the Money")

(53) *I think he did this to appear cooperative, so we wouldn't make trouble*. (COHA: 1998; FIC: "Roundup")

*5.5.4 "*Lest we forget*"*

Another point which should be made with reference to *lest* is the presence of a fixed, almost idiomatised expression, namely *lest we forget*.

In order to check for any signs of idiomatic expression building three identical searches were conducted in three different corpora – namely COHA, COCA and NOW[36]. The search input was simply "*lest"* and the goal was to find and compare most frequent collocates to the right of *lest*. The number of words to the right was limited to three.

[34] Cambridge Dictionary Online, s.v. *avoid* def. B1 retrieved on December 28, 2017 from https://dictionary.cambridge.org/dictionary/english/avoid.
[35] Cambridge Dictionary Online, s.v. *avoid* def. B2 retrieved on December 28, 2017 from https://dictionary.cambridge.org/dictionary/english/avoid.
[36] https://corpus.byu.edu/now/.

Number	Most frequent collocates					
	COHA		COCA		NOW	
1	SHOULD	2771	BE	349	WE	4227
2	MIGHT	535	THEY	306	FORGET	3331
3	FALL	138	THINK	143	THEY	2516
4	LOSE	108	FORGET	124	YOU	1859
5	BECOME	94	ANYONE	80	THINK	918
6	FORGET	81	SHOULD	64	ANYONE	569
7	THOU	74	BECOME	55	GET	455
8	BETRAY	52	LOSE	36	BECOME	369
9	SEEM	50	FALL	25	LOSE	238
10	DISTURB	48	SEEM	25	ACCUSED	194

Table 5-14: Ten most frequent collocates of *lest* to the right in COHA, COCA and NOW.

Since COHA is a historical corpus, both the most frequent collocates of *lest* from the past and the present can be found among the ten most frequent collocates. Of course, because of the fact that *lest* used to be far more frequent in the past than in the recent decades, one can safely assume than what we see in Table 5-14 for COHA is rather representative of the nineteenth than of the twentieth century. In the case of COCA, we see that the three most frequent verbs collocating with *lest* are *be*, *think* and *forget*. The most recent of the three corpora – NOW – lists *we* and *forget* as the two most frequent collocates. Furthermore, the frequency of *forget* as a collocate of *lest* is, in the NOW corpus, more than three times higher than of the second most frequent verb collocating with *lest*, namely *think*.

This might suggest that *lest* is becoming increasingly more idiomatic – as a part of the phrase *lest we forget*, which in modern North American English is being used in a few different contexts. According to the Macmillan Dictionary[37] *lest we forget* is a phrase which is "used when reminding people of something very important" and which is often used in a humorous way. However, it is not uncommon to hear the words *lest we forget* with

[37] https://www.macmillandictionary.com/dictionary/american/lest-we-forget, search conducted on April 4, 2018.

reference to Remembrace Day (Canada) or Veterans Day (United States). As Creasey (2014: 31) writes:

> *Lest we forget* is a phrase from the poem "Reccessional" written by Rudyard Kipling in 1897 for Queen Victoria's Diamond Jubilee (…). In the poem, the words referred to the importance of remembering the sacrifice of Jesus Christ, but ever since the First World War, the phrase has been used to inspire us to remember, and to "never forget" the sacrifices made for us in war by these brave men and women.

Thus, there are a few possible contexts in which *lest we forget* might be used. Given the relatively low frequency of use in the most recent decades of COHA (see Table 5-13 and Figure 5-14), it seems plausible that *lest* is on the way to becoming a part of a fixed idiomatic expression. This possibility is once more addressed in Chapter 9, in the section revising the potential outcomes of obsolescence. Furthermore, Chapter 6 explores some of the genre-related issues concerning the subordinator *lest*.

5.6 Summary and the bigger picture

In the present chapter we have looked at potential competitors in the network of subordinators of purpose. The main aim was to explore the possibility whether the decrease in the frequency of use visible in the case of *in order to*, *in order that*, *so as to* and *lest* (see Fig. 4-2 or 4-3 in Chapter 4) is caused by competition on the constructional level.

For the two constructions introducing non-finite purpose clauses, *in order to* and *so as to*, we focused on potential competition with the *to*-infinitive, which has "always" been used to convey purposive semantics (see Section 5.2 of the present chapter). After a qualitative analysis of three random samples each containing 100 instances of a *to*-infinitive, we normalised the results to have a look at the approximate frequency trends. Contrary to the *to*-infinitive as such (in all possible uses and contexts), which is not shown to increase in frequency of use over the last two hundred years, the purposive *to*-infinitive displays a certain degree of increase, especially in the last three decades of the twentieth century (see Fig. 5-5). The most striking observation concerning the purposive *to*-infinitive is, however, the fact how much it dominates the picture of non-finite purpose clauses (see e.g. Fig. 5-6 in Section 5.2). Fig. 5-14 shows the shares of purpose-related same-subject situations realised by *in order to*, *so as to* and the purposive *to*-infinitive in 1810, 1900 and

2000. The percentages were calculated by taking the frequencies per million words of the three constructions, adding these frequencies to obtain the figure standing for the 100% and checking for the percentage each of the constructions realises. In comparison to the amount of purposive semantics being conveyed with means of a *to*-infinitive, the most popular non-finite subordinators, *in order to* and *so as to* seem to situate themselves on the margins of this functional niche.

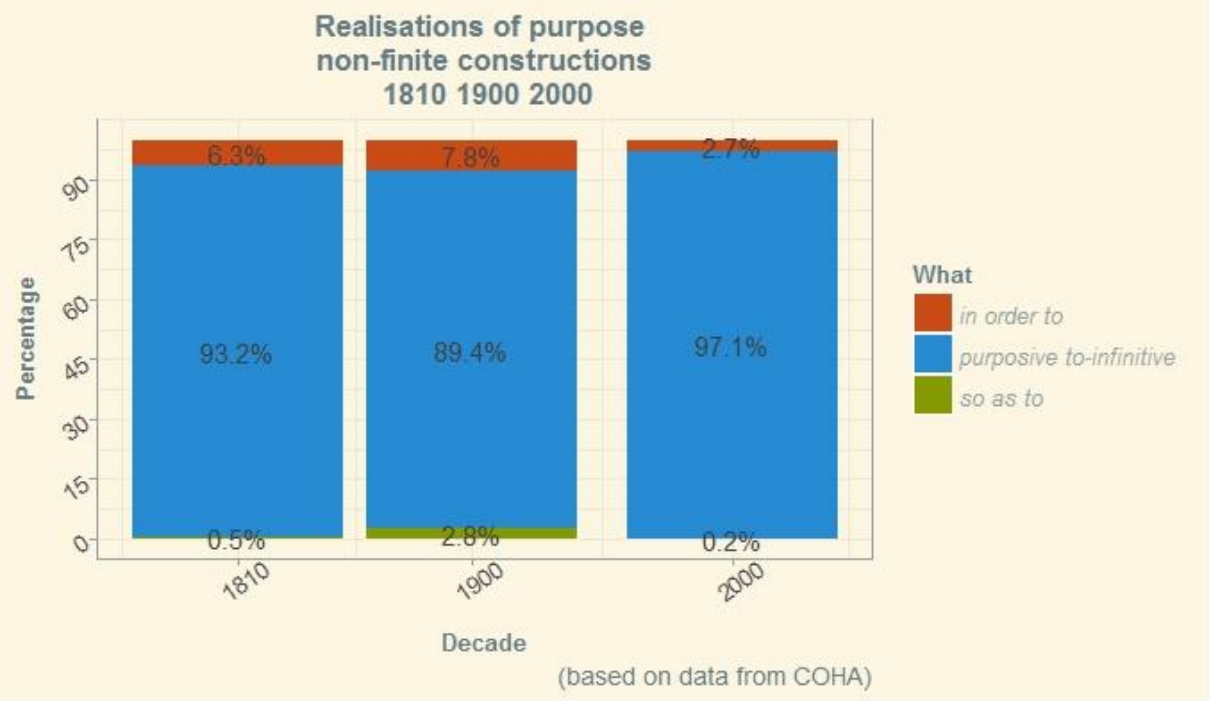


Fig. 5-14: Realisations of purpose by non-finite purpose clauses in 1810, 1900 and 2000.

For the finite purpose subordinator which has shown probably the most dramatic decrease in the frequency of use, namely *in order that*, there were four potential competitors discussed and analysed, namely, *in order for * to*, *for * to*-infinitive, *so that* and its shorter version *so*. Even though *in order for * to* seemed to be the most natural of the competitors, the analysis of frequency gains and losses (see Table 5-6) has not shown it to be the case. Even though *in order for * to*, which is discussed to have potentially started out due to diffusional spreading of *for * to*-infinitives, a process described by De Smet (2013, see Section 5.3.3), might nowadays look as if it was replacing *in order that*, the increase in the frequency of use displayed by this construction is too low to account for the decrease observed in the case of *in order that*. However, *for * to*-infinitive itself, which is by Mair & Leech (2006) and De Smet (2013) shown to be increasing in the frequency of use and

popularity, seems to be a more likely competitor of *in order that* (see Section 5.3.4). The data from COHA show a clear trend of increase in the frequency of use of the pattern *for* * *to*-infinitive and *for* * * *to*-infinitive (see Fig. 5-10). Furthermore, the data analysed by De Smet show that also the number of *for* * *to*-infinitives conveying purposive semantics is on the increase (see Table 5-7). All in all, this suggests that *for* * *to*-infinitive might actually be a more likely competitor of *in order that* than *in order for* * *to*.

Two more potential competitors of *in order that* have been analysed, namely, *so that* (see Section 5.4) and its shorter version *so* * + finite clause of purpose. For the estimation of frequency figures for *so that*, used to denote purpose, and not purpose and result, the observations on the gestalt features of finite purpose clauses in Schmidtke-Bode (2009) and Croft (2001) were used. According to Schmidtke Bode (2009: 30) what differentiates clauses of purpose from clauses of result is the presence of a modal auxiliary in the former ones, this being necessary to convey a hypotheticality typical for purposive semantics. While *so that*, used to denote purpose and both purpose and result, has been shown to decrease in the frequency of use (see Fig. 5-11), *so* * + finite clause has been shown to note a very marked increase (see Fig. 5-13), both when it comes to the purposive and general context. Even though the results are only an approximation, since one sample of 100 instances for each of the three time points (1900, 1950 and 2000) has been analysed, it does seem very plausible that if we analysed more samples, the increase would still be visible.

When it comes to the only subordinator used for the expression of negative purpose, namely *lest*, the visual inspection of the frequency trends of the functional equivalents revealed the presence of only two potentially serious competitors – the infinitive *to avoid* and *so* * + (negated) finite clause (see Section 5.5.3). The former is shown to decrease in the frequency of use throughout the 19th century, before displaying an increase from the beginning of the 20th century onwards. The increase in the frequency of use of the latter (see Fig. 5-13) is big enough to potentially account also for some degree of replacing *lest*. Nevertheless, we shall not forget that both potential competitors of *lest* are constructions which are structurally very different from the construction they might be replacing. To look at the decline of *lest* just in terms of competition on the constructional level would be an oversimplification. Moreover, it does seem very plausible that *lest* itself is on the way to becoming a part of a fixed, idiomatic expression – *lest we forget* (see Section 5.5.4).

To summarise the developments in the whole constructional network, the constructions which are likely to be winning the competition with the variants shown to

decrease in the frequency of use, all share one characteristic: they are shorter and less elaborate than the subordinators which are observed to decrease. To some extent, one might be even tempted to say that the variants which are shown to increase are indeed shorter versions of the variants which decrease, e.g. *so* * + finite clause could be potentially replaced by *so that* + finite clause or *in order that* + finite clause; a purposive *to*-infinitive could have *in order* or *so as* in front; *for* * *to*-infinitive could, in many cases, be replaced by *in order for* * *to* (which itself increases in the frequency of use, though very slowly and with the frequency figures still being very low, see Table 4-1) or reformulated and expressed by the use of *in order that*.

At this point it is fair to say that all these developments should not be viewed as independent mini-trends on the constructional level. This seems to be a larger trend, which is only detected after we have seen the bigger picture and explored the question of competition on the constructional level. For now it is clear, that even though some of the observed developments do fulfil the two prerequisites for competition (see Section 5.1) discussed by Hundt (2014: 171), and taken from Lass (1997) and Hundt & Leech (2012), the observed trends and tendencies need to be explored in greater depth in the following chapters.

6. Changes in the distribution across genres and contexts

Better be alone than in bad company

The present chapter deals with genre-related phenomena which might be seen as symptoms of obsolescence. The major aim is to study whether, with regard to the investigated constructions, there are any signs of distributional fragmentation, a phenomenon which Leech et al. (2009: 81) refer to when a given construction is "increasingly restricted to certain genres and, within those genres, to certain texts" instead of showing a more or less even distribution across all genres represented in the corpus. As was already indicated in Section 2.2, an example given by Leech et al. (2009) is the modal *shall*, which is, with third-person subjects, predominantly attested in official and administrative documents.

The formal nature of the genres which attract the potentially obsolescent constructions is something worth emphasising, since probably all of the works that observed and described some form of distributional fragmentation (Leech et al. 2009; Hundt and Leech 2012; Hundt 2014; Hopper & Traugott 2003) did so with reference to the "more elevated", formal, official or specialised genres. However, the fact that a construction is predominantly present in one or two particular genres is not enough to treat it as obsolescent, since, as Leech et al. (2009: 81) say, the construction has to be "increasingly restricted to certain genres". Thus, the restriction has to be a result of a recent diachronic process.

There are four constructions which will be investigated with regard to their genre-related distribution, namely *in order to*, *in order that*, *so as to* and *lest*. *In order for * to* will not be looked at, since it does not fulfil the necessary condition for obsolescence – its frequency does not show a negative correlation with time (see e.g. Table 4-3 or Section 4.6).

The first part of the present chapter offers a synchronic view of distributional fragmentation and discusses the distribution of the constructions in the Corpus of Contemporary American English (COCA). The second part aims at providing a diachronic approach to distributional fragmentation, seen as a process in time, by investigating the changes of the genre-related distribution across time. For the second part, the corpus of choice is COHA. The third part approaches the issue of genre-related phenomena from yet

a different angle and presents a collexeme analysis (a variant of collostructional analysis) of *in order to* at two different points in time to offer insights into the semantic contexts in which the constructions in question occur. Since, if one possible sign of obsolescence is a situation in which a construction is "increasingly restricted to certain genres" (Leech et al. 2009), another sign could, by analogy, be a growing restriction of a construction to certain contexts and certain ranges of meaning.

6.1 Distributional fragmentation – a synchronic view

What is the distribution of *in order to*, *in order that*, *so as to* and *lest* across the different genres in Present Day English? A natural way to check this is to refer to a multi-genre corpus of contemporary American English, such as COCA, which contains more than 560 million words of text (20 million words for each year from 1990 till 2017)[38]. The corpus is balanced between the following five genres: *spoken*, *fiction*, *popular magazines*, *newspapers* and *academic texts*. Due to this property, the task of investigating the distribution of the constructions in question across different genres in the time period represented by the corpus (1990-2017) does seem relatively easy in principle. Still, a few words should to be said about the COCA genres first.

6.1.1 COCA genres

As has already been indicated, COCA contains five genres and the words of text are almost evenly divided among those genres. However, if we look closely, we can see there are some differences in the number of words of the particular sections, e.g. the genre *popular magazines* contains over 118 million words of text, whereas *academic journals* (interchangeably referred to as *academic texts*) contains almost 112 million words. The difference of more than 6 million words might seem large, but given the overall size of the particular COCA sections it amounts to just over 5% of the largest of them (*fiction*). Moreover, the online interface is able to calculate the normalised frequency of use of a given word or construction, so the slight differences in size between particular sections are not expected to interfere with the results.

Naturally, the COCA genres differ with regard to their contents. According to the information on the webpage, the genre *spoken* contains transcripts of unscripted

[38] https://corpus.byu.edu/coca/.

conversations from over 150 different TV and radio programmes such as *The Today Show* (NBC TV Network) and *Good Morning America* (ABC Television Network). The section *fiction* contains first chapters of first editions of books from 1990 onwards, short stories and plays from literary magazines, children's magazines and play scripts. The *popular magazines* genre is composed of texts from almost 100 different magazines focused around various domains such as health, sports, home & gardening, news etc. Among the magazines represented in COCA there are e.g. *National Geographic*, *Harper's Bazaar*, *Vegetarian Times*, *Jezebel* and *Vanity Fair*. The *Newspapers* genre contains a mix of different sections of ten newspapers from across the United States, such as *The Christian Science Monitor*, *The New York Times* and *The Denver Post*. The texts belonging to the genre of academic texts were chosen with the aim of covering all the categories distinguished by the Library of Congress classification system. In practice, this means that to each source of text there is a letter assigned which classifies it as representing one of the twenty categories, such as *E – History of the Americas*, *G – Geography, Anthropology, Recreation*, *R – Medicine* etc. As is stated on the COCA webpage, the texts in this genre were selected from nearly 100 different peer-reviewed journals such as e.g. *The Journal of Sport Behavior*, *The Chronicle of Higher Education* and *Ear, Nose and Throat Journal.*

6.1.2 Data and Methodology

The simplest way of checking the distribution of a particular construction is to type it into the search box of the online interface of COCA (https://corpus.byu.edu/coca/), and to select the "chart view". The results are given in the form of raw and per million words frequencies per each genre. Also, the exact number of words per section is indicated. These results can be used to check for the percentage distribution of each construction across the genres. Note that, as has been done for similar calculations in previous chapters (see e.g. Section 4.2.1), for *in order to* and *so as to*, both the default and the negative variant (*in order not to*; *so as not to*) were searched for and their frequency figures added to each other.

6.1.3 Results and Discussion

Table 6-1 sums up the frequencies per million words of *in order to, in order that, so as to* and *lest* across the different COCA genres. The results are given in the form of percentages in Table 6-2. The visual inspection of the figures reveals that in the case of three out of four subordinators the most popular linguistic environment is the genre

academic texts. Only for *lest* does the distribution look more or less even and there is no single genre that dominates the picture. Figures 6-1 – 6-4 present the results in the form of percentage bar charts.

COCA genres	**Frequency per million words**			
	in order to	***in order that***	***so as to***	***lest***
spoken	76.11	0.47	2.3	1.37
fiction	37.69	0.58	12.17	6.92
popular magazines	75.23	0.72	6.95	5.44
newspapers	41.71	0.25	3.81	2.89
academic texts	199.77	2.03	17.62	5.41

Table 6-1: Frequency per million words of *in order to*, *in order that*, *so as to* and *lest* across five COCA genres.

COCA genres	**Distribution across genres in percentage**			
	in order to	*in order that*	*so as to*	*lest*
spoken	17.68%	11.6%	5.37%	6.22%
fiction	8.75%	14.32%	28.4%	31.4%
popular magazines	17.47%	17.78%	16.2%	24.7%
newspapers	9.7%	6.18%	8.9%	13.12%
academic texts	46.4%	50.12%	41.13%	24.56%

Table 6-2: Distribution of *in order to*, *in order that*, *so as to* and *lest* across five COCA genres.

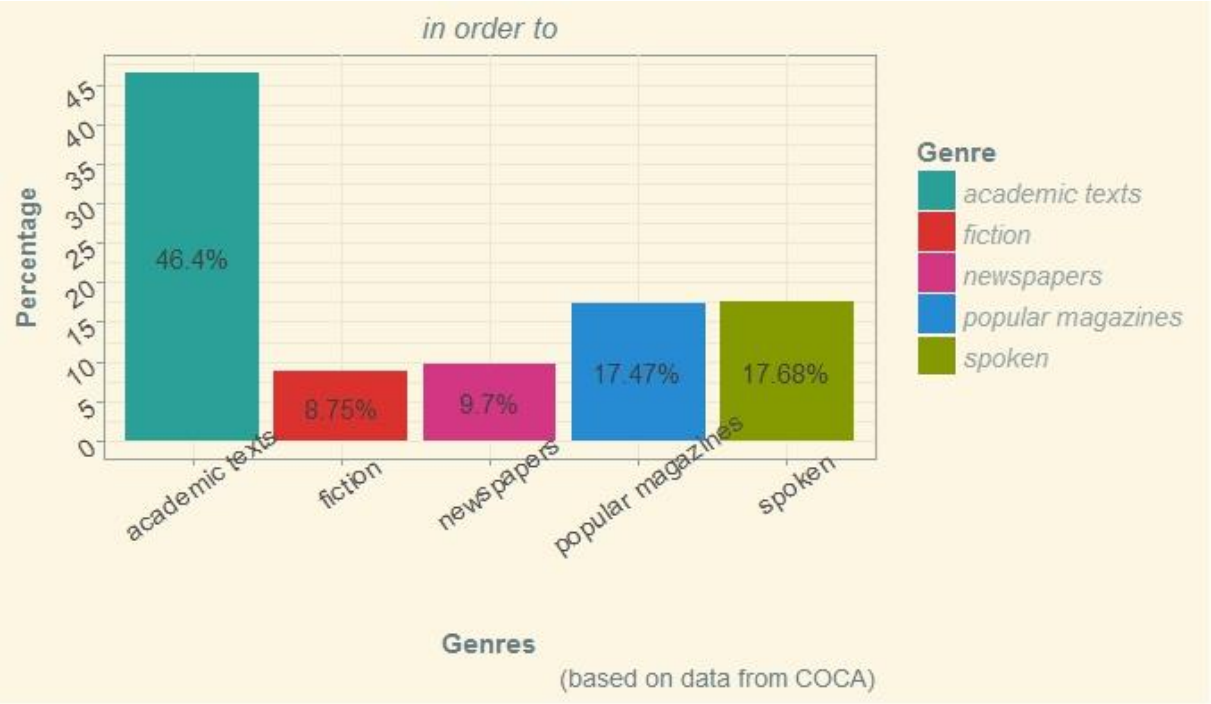


Fig. 6-1: The distribution of *in order to* across COCA genres in the time period 1990-2017.

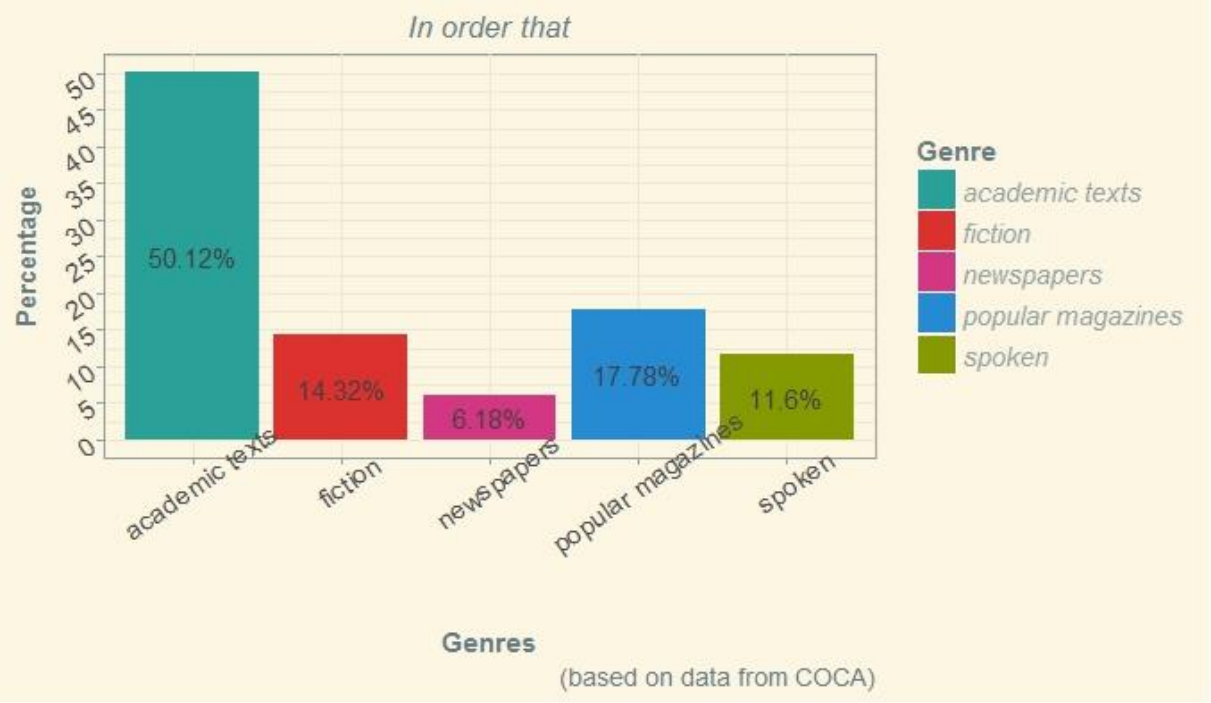


Fig. 6-2: The distribution of *in order that* across COCA genres in the time period 1990-2017.

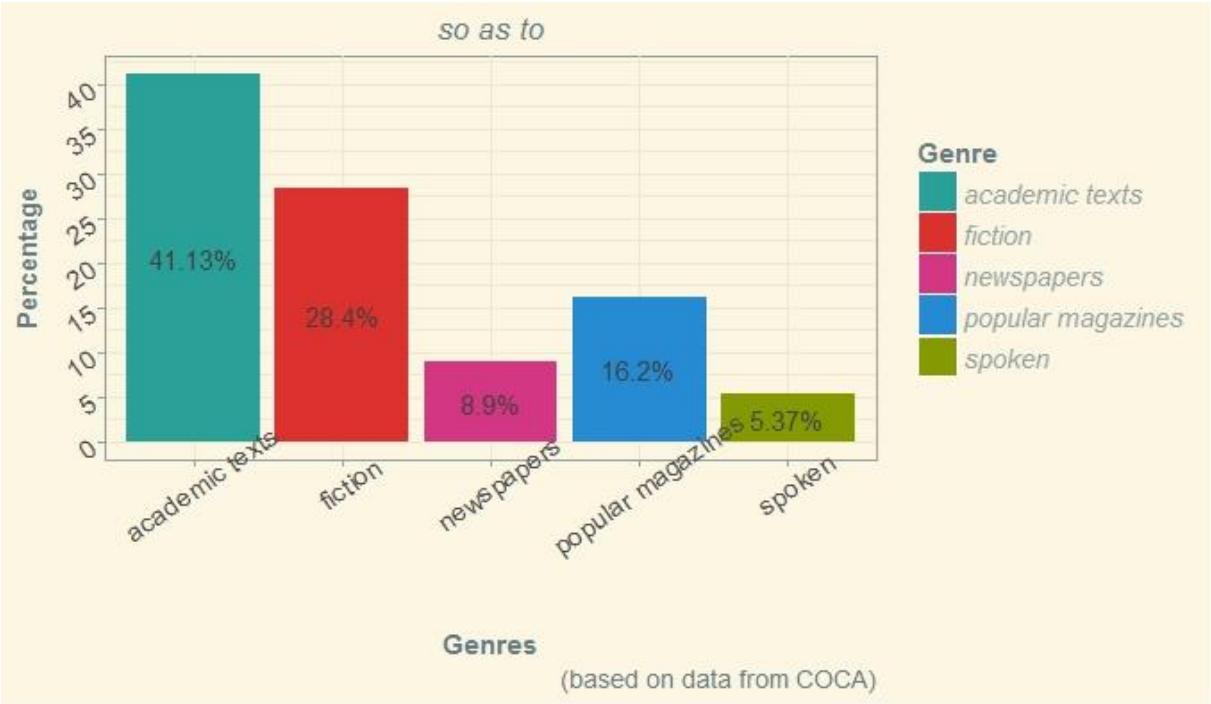


Fig. 6-3: The distribution of *so as to* across COCA genres in the time period 1990-2017.

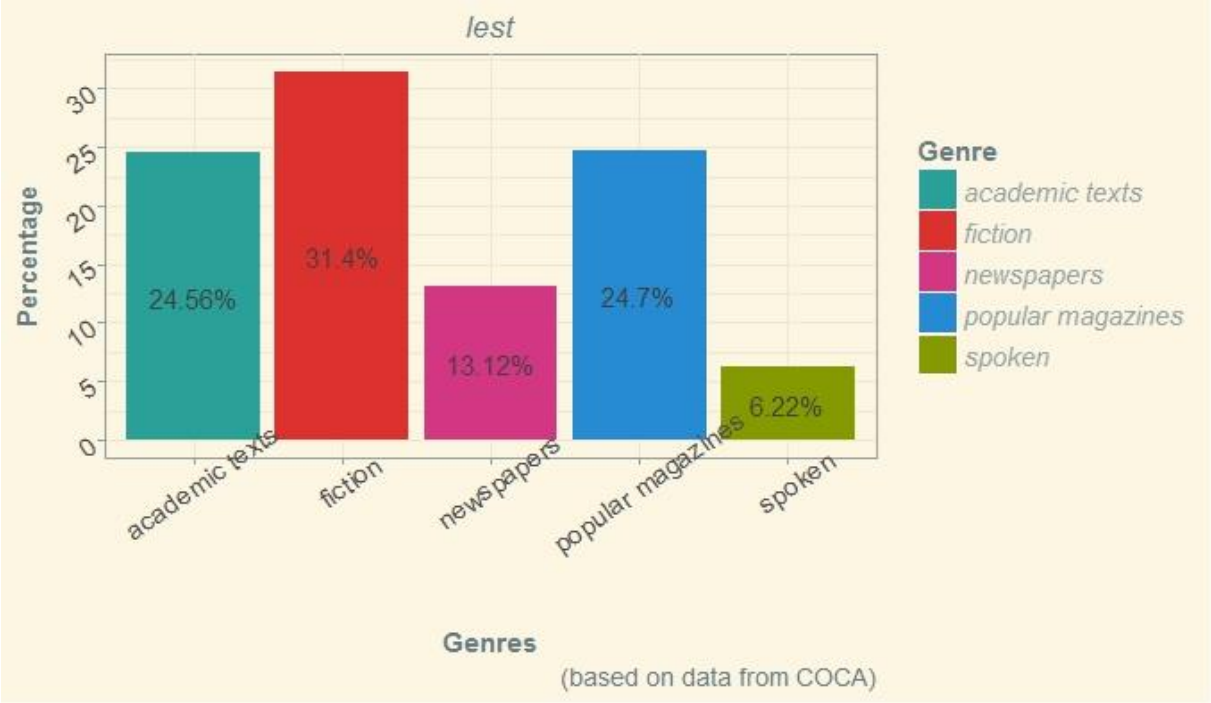


Fig. 6-4: The distribution of *lest* across COCA genres in the time period 1990-2017.

As we can see in Fig. 6-2, in the case of *in order that*, more than 50% percent of instances can be found in the *academic texts* genre. The trend is very similar for *in order to* and *so as to*, see Figs. 6-1 and 6-3 respectively, as approximately 46.4% of all instances of *in order to* and 41.13% of *so as to* can be found the academic genre. The lowest number of instances of *in order to* can be found in *fiction* (8.75%), of *in order that* in *newspapers* (6.18%), and of *so as to* in the *spoken* genre (5.37%). In the case of *lest* the most "densely inhabited" genre is *fiction*, which gathers 31.4% of all its instances, closely followed by *popular magazines* (24.7%) and *academic texts* (24.56%).

This, more or less even distribution of *lest* across the COCA genres may seem surprising given the overall tendency towards distributional fragmentation noted in the case of *in order to*, *in order that* and *so as to*. However, a more in-depth analysis of the particular subsections of the three genres with the highest numbers of *lest* reveals that there actually is some contextual preference, that is in the genre of *fiction*, 31.25% of all instances of *lest* occur in the books classified as *SciFi/Fant* (science-fiction/fantasy), in the genre of *popular magazines* 26.99% occur in sources focused around the domain of *religion*, and, in the genre of *academic texts*, the section with the highest number of *lest* is classified as *Phil/Rel* (covering topics such as philosophy and religion). Table 6-3 presents the more in-depth percentage distribution of *lest* across the three COCA genres with the highest rate of occurrence in terms of frequency per million words (*fiction*, *popular magazines* and *academic texts*). Each genre is treated as 100% and the subsections of the particular genres show the fraction of the whole number of occurrences of *lest* per given genre.

Subsections	**Percentage of instances of *lest* per subsection of a given genre**	**Subsections**	**Percentage of instances of *lest* per subsection of a given genre**
Subsections of *magazines*		FIC: Gen (Jrnl)	22.03%
MAG: News/Opin	12.13%	FIC: SciFi/Fant	31.25%
MAG: Financial	9.44%	FIC: Juvenile	18.91%
MAG: Sci/Tech	7.09%	FIC: Movies	5.57%
MAG: Soc/Arts	9.83%	**Subsections of *academic texts***	
MAG: Religion	26.99%	ACAD: History	11.15%
MAG: Sports	6.36%	ACAD: Education	6.87%

MAG: Entertain	6.69%	ACAD: Geog/SocSci	8.12%
MAG: Home/Health	6.82%	ACAD: Law/PolSci	11.41%
MAG: Afric-Amer	2.21%	ACAD: Humanities	14.51%
MAG: Children	6.85%	ACAD: Phil/Rel	20%
MAG: Women/Men	5.59%	ACAD: Sci/Tech	3.66%
Subsections of *fiction*		ACAD: Medicine	4.73%
FIC: Gen (Book)	22.23%	ACAD: Misc	19.55%

Table 6-3: Percentage of *lest* across different subsections of *magazines*, *fiction* and *academic texts*.

6.1.4 Conclusions

In order to, *in order that* and *so as to* all show some degree of distributional fragmentation. They concentrate in *academic texts*. However, in the COCA data, each of these subordinators is still present across all the genres represented by the corpus. Their presence is attested even in the least formal and most colloquial COCA genre of *spoken*.

Lest presents a slightly different pattern of distribution, as there is no single genre that dominates the distributional picture. However, across all genres there is a certain preference for *lest* in authors dealing with topics such as religion and philosophy. Can this already be viewed as a tendency? As has already been indicated in Section 3.2.5, *lest* is often perceived as an archaic and very formal piece of linguistic structure (Greenbaum & Quirk 1990: 323; Schmidtke-Bode 2009: 130). Furthermore, *lest* as such might be in the process of becoming largely restricted to one specific idiomatic expression, namely *lest we forget* (see Section 5.5.4), which itself can be associated with topics such as religion, history and politics. What is more, *lest*, used as a subordinator of negative purpose, is very frequently followed by a verb in the form of present subjunctive (Urata 2005: 262) and subjunctive is nowadays often judged as overly-formal and somewhat unusual (Lury 2016). Some authors of style guides and manuals for writers discourage their readers from the use of subjunctive, as, e.g., Hudson (2016):

> [M]ost people seldom use the subjunctive in ordinary speech, which means it is appropriately avoided in most dialogue. (…) As stated elsewhere, don't make characters speak like English professors unless they actually are. Similarly, any book written in a colloquial or highly personal voice should probably not use a lot of verbs in the subjunctive mood, unless the author has a particular erudite tone that demands it.

Thus this observed preference of authors to use *lest* in texts associated with religion and philosophy and in science-fiction & fantasy books might have to do with its deliberate application – be it as a marker of style – or be it with an aim of giving the text a certain degree of sophistication.

6.2 Distributional fragmentation – a diachronic view

The previous section showed that *in order to*, *in order that*, *so as to* and *lest* have certain "preferences" when it comes to genres they occur in. But has it always been like that or are these preferences really a sign of distributional fragmentation understood as process happening over time? In order to answer this question we can consult a multi-genre diachronic corpus of English, such as COHA (for more information on COHA genres see Section 2.4.1).

The simplest option to see whether *in order to*, *in order that*, *so as to* and *lest* are becoming more concentrated in some genres than in others would be to check for the normalised frequencies of occurrence per decade and per genre. Still, it needs to be noted that in contrast to COCA (see Section 6.1 and 6.1.1), the contents of COHA are not equally divided between the represented genres, and the division in terms of the number of words is not even close to being balanced. For example, in the decade of 1960, 55.5% of the contents are taken up by *fiction*, 26% by *magazine*, 17% by *non-fiction* and 1.5% by *newspaper*, whereas for the decade 2000, the proportions are 49% for *fiction*, 26% for *magazine*, 14 % for *newspaper* and 11% for *non-fiction*. This uneven distribution is, however, not a very big problem with regard to the frequencies of use, since COHA offers an option of searching for words and language patterns in only one genre and the results are shown both as raw figures and figures normalised with regard to the sample size (and not to the corpus size as a whole).

However, things become problematic if one is willing to conduct a comparison between different genres, mainly because of the fact that the constructions we are investigating have been shown to decrease in the frequency of use and, in the case of some of them, such as for example *in order that*, the observed decrease is really dramatic (see Table 4-1, Fig. 4-2). For the now very infrequent variants chances are that if we operated with the normalised frequency values, we would not be able to observe a direct concentration increase in any genre (an immediate symptom of genre-related concentration), because of the overall and very strong trend of decrease in the frequency of use.

Thus, in order to measure genre-related concentration, I will extrapolate the frequencies as if each of the four genres actually made up 25% of the corpus. Due to this approach the fact that the constructions decrease in the overall frequency of use will not interfere with what we want to observe. An additional advantage of looking at distributional fragmentation in terms of probabilities (represented as percentages) is the possibility of making comparisons with the percentage distributions in COCA (Figs. 6-1 – 6.4).

6.2.1 Data and Methodology

There are two research questions: i) what probability of coming across the investigated variants would we have for each COHA genre if these genres were of equal size, and ii) does this probability change with regard to certain genres over time?

The data we need for the present study include the exact size of each genre for each decade and the raw frequency of the constructions we investigate (per each decade and per each of the four genres). The data can be easily extracted from the online interface of COHA.

The probability of coming across a random word in each of the COHA genres (*fiction*, *newspaper*, *magazine* and *non-fiction*) is calculated and then rescaled so that each genre represents 25% of the whole. Next, the probability of coming across the construction in question is calculated with the use of the rescaled genre-partition we got in the previous step. For each of the investigated constructions we need to calculate the probability of occurrence of a given construction for each of the studied decades and in each of the four genres.

The present study only deals with the time period of 1860-2009, since before the decade 1860 the genre *newspaper* is not included in the contents of COHA. There are four

decades (serving as time points) chosen at which we look for any tendencies and developments, namely 1860, 1900, 1940, 2000.

The variants we investigate are: *in order to*, *in order that*, *so as to*, *lest*, *in order not to* and *so as not to*. The separation of the negative variants of *in order to* and *so as to* from their default version serves the purpose of answering the question whether they would show a different distributional pattern than their positive counterparts.

6.2.2 Results and Discussion

Table 6-4 presents part of the results – for every construction the figures for four decades (1860, 1900, 1940 and 2000) and for each genre within those decades are given. Figures 6-5 – 6-10 present the visualisations of results for all the investigated variants.

Decade	**Genre**	**Probability across genres in percentage**					
		in order to	***in order that***	***so as to***	***lest***	***in order not to***	***so as not to***
1860	***fiction***	8.64%	8.66%	11.87%	33.42%	9.09%	34.62%
	newspaper	28.99%	28.23%	33.43%	11.38%	0%	0%
	magazine	30.97%	29.73%	23.04%	27.24%	24.22%	23.06%
	non-fiction	31.4%	33.38%	31.65%	27.95%	66.69%	42.33%
1900	***fiction***	8.61%	9.41%	11.75%	28.57%	8.52%	33.43%
	newspaper	23.43%	26.98%	20.14%	17.35%	7.03%	15.75%
	magazine	28.01%	23.12%	22.24%	24.61%	12.14%	20.42%
	non-fiction	39.95%	40.49%	45.87%	29.47%	72.31%	30.4%
1940	***fiction***	9.46%	8.63%	10.75%	21.9%	30.91%	43.02%
	newspaper	26.3%	26.62%	31.93%	22.48%	27.64%	18.7%
	magazine	22.12%	13.43%	14.05%	31.12%	25.32%	19.58%
	non-fiction	42.12%	51.32%	43.27%	24.49%	16.13%	18.71%
2000	***fiction***	11.25%	14.97%	27.04%	30.13%	15.74%	40.33%
	newspaper	15.66%	0%	5.98%	4.94%	0%	17.13%
	magazine	21.18%	0%	15.14%	23.44%	29.39%	15.06%

	non-fiction	51.91%	85.03%	51.83%	41.49%	54.87%	27.48%

Table 6-4: Probability of finding a given construction across genres for four decades – 1860, 1900, 1940 and 2000.

Let us start by looking at *in order to* and its negative variant *in order not to*. As we can see in Fig. 6-5, between 1860 and 1890 the probability that a random *in order to* belongs to either *newspaper* or *magazine* or *non-fiction* was equally high. It was, however, visibly lower for *fiction*. From the decade 1900, the genre *non-fiction* is shown to be taking the lead. From 1920 onwards, there is a clear upward tendency for this genre. In the last decade of the studied period the probability amounts to over 50%, which means that for a random[39] *in order to*, in the decade of 2000, there is a 50% chance that it belongs to the *non-fiction* genre. At the same time, there is a decrease in the probability for *magazine* and *newspaper*. *Fiction*, on the other hand, shows a low probability of around 10% throughout the entire period.

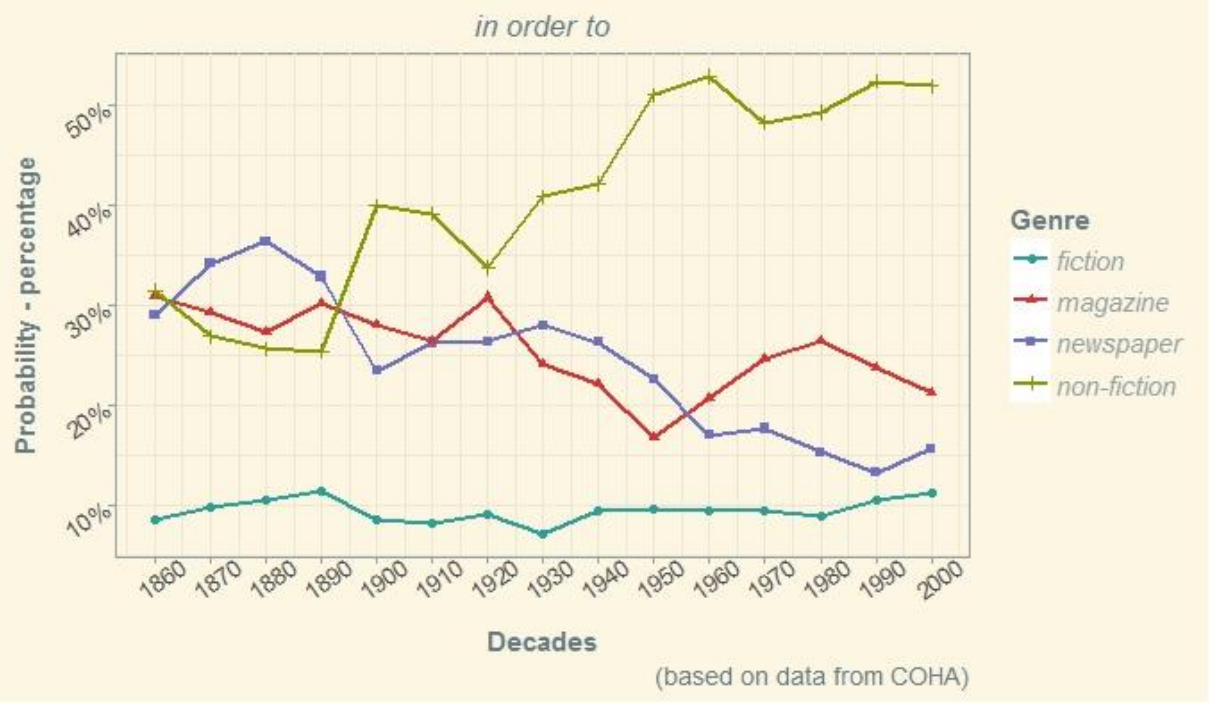


Fig. 6-5: Probability of coming across *in order to* in different genres of COHA.

[39] It is worth to emphasise that a random occurrence of a particular construction in a given decade does not refer to its occurrence in the COHA data, but to a predicted occurrence in the idealised data, rescaled to evenly represent all involved genres, see Section 6.2.1.

The diachronic development of probabilities for the negative variant, *in order not to*, is visualised in Fig. 6-6. The picture is very different from what we have seen in Fig. 6-5. The figures are shown to be fluctuating, there are many ups and downs and no clear tendencies. Given the fact that *in order not to* is, in general, much rarer than *in order to* (see Section 7.2), this might mean that even the dataset obtained from a mega-corpus such as COHA was to small to provide us with enough representative results. It is, however, also possible that there are simply no observable tendencies towards the dominance of one particular genre in the picture.

Fig. 6-6: Probability of coming across *in order not to* in different genres of COHA.

Figures 6-7 and 6-8 present the probability trends for *so as to* and *so as not to*. The line plots in Fig. 6-7 show a tendency quite similar to what we have seen for *in order to* (Fig. 6-5). Starting from the decade 1900, there is a clear increase of probability of occurrence of *so as to* in the genre of *non-fiction*. In the decade 1990, it peaks and reaches the mark of 60%, which means that for a random *so as to* found in COHA in the decade of 1990, there is 60% of chance that it can be found in the *non-fiction* genre. In the case of the other three genres, there is a downward trend. However, it is less pronounced than in the case of *in order to*.

Fig. 6-7: Probability of coming across *so as to* in different genres of COHA.

Fig. 6-8: Probability of coming across *so as not to* in different genres of COHA.

For *so as not to* (see Fig. 6-8), the trends are, again, less clearly defined than they are for the positive variant. Still, *so as not to* does seem to be slightly more typical for the genre of *fiction* than for any other genre, at least from the early twentieth century onwards.

For both *in order not to* and *so as not to*, the differences in terms of values between the particular points in time are much larger than for the default positive variants, which gives the line plots a somewhat random look, at least in comparison to the smooth line plots of *in order to* (Fig. 6-5) and *so as to* (Fig. 6-7).

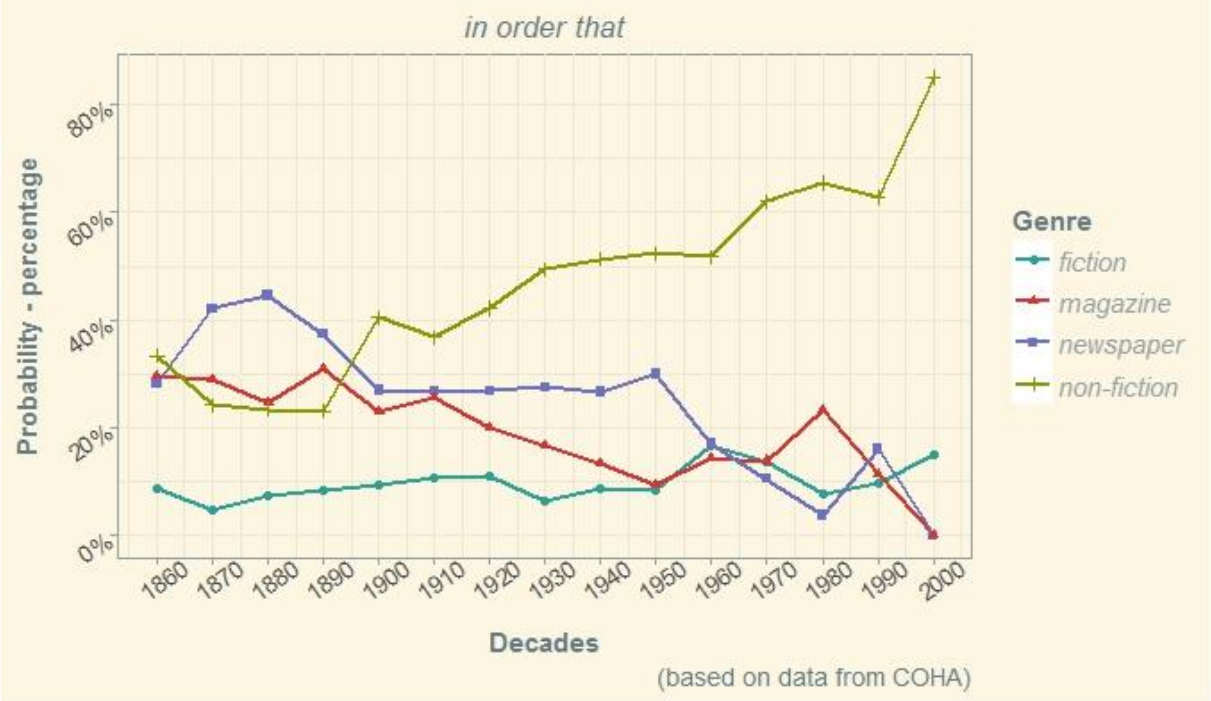


Fig. 6-9: Probability of coming across *in order that* in different genres of COHA.

Figure 6-9 presents the results for *in order that*. The observed increase of probability of occurrence per genre is, without doubt, very defined. The tendency for *in order that* to occur, above all, in the *non-fiction* genre can be observed from the early twentieth century onwards and has got stronger since then. In the decade of 2000 we have more than 85% of chance that a random *in order that* found in the corpus belongs to the *non-fiction* genre. In the case of *newspaper* and *magazine*, the probability of occurrence gradually goes down and in the decade 2000 it equals zero. In general, the visualisation of results for the time period of 1860-1900 looks strikingly similar for both *in order that* and *in order to* (see Figs. 6-5 and 6-9). Surprisingly, the genre of *fiction* presents a more or less stable pattern for

both *in order that* and *in order to* (see Fig. 6-5). One educated guess to explain this situation would be to relate what Hudson (2016) said with reference to *lest* (see Section 6.1.4) to the fact that in literature there is room for all kinds of different personalities and characters. Some of them would certainly also speak in more "elaborate" and "sophisticated" ways, and some of them could really portray English professors.

The results for *lest* are presented in Fig. 6-10. The line plots for the four genres do not show any coherent trends. Even though there are many fluctuations, the mark of 50% is not crossed at any time by any genre. In the second half of the twentieth century there is a strong downward trend for *lest* in the genre *newspaper*, however, one has to note that it was preceded by an equally strong upward trend between 1930 and 1950.

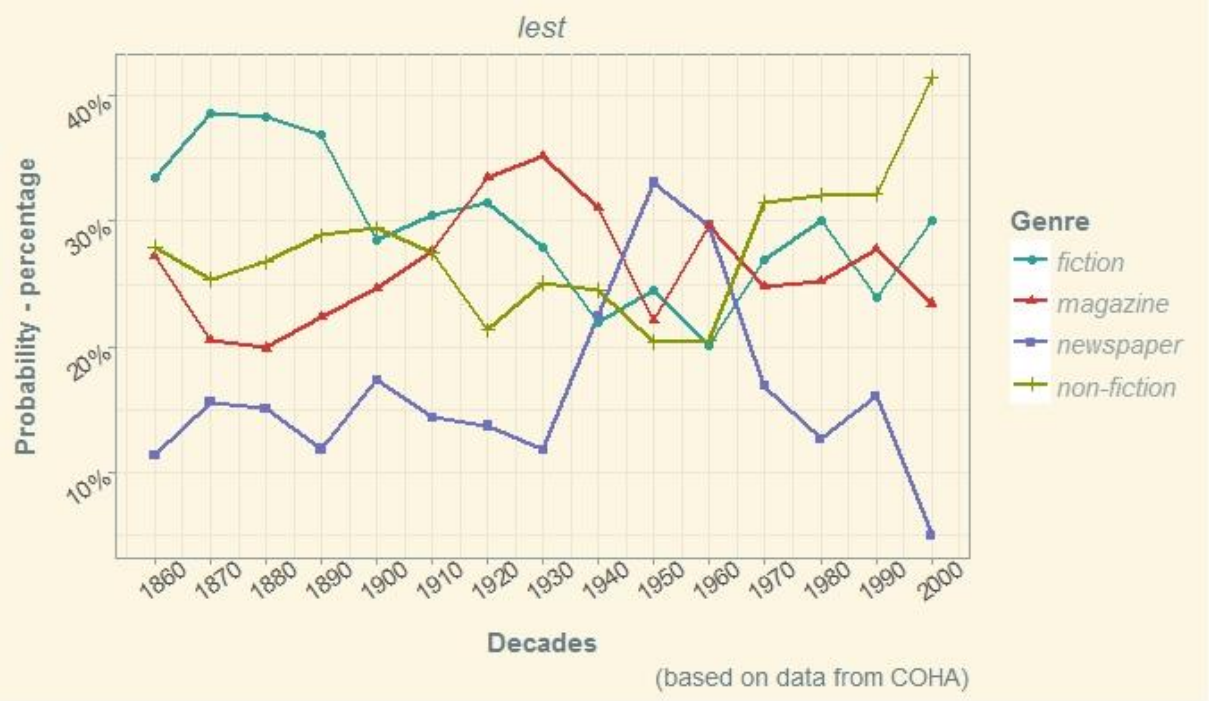


Fig. 6-10: Probability of coming across *lest* in different genres of COHA.

6.2.3 Diachronic genre-related concentration

Section 6.2.2 has presented a method of looking at distributional fragmentation from a diachronic perspective. Since we already have the probability distributions for each of the constructions per each decade in the time period 1860-2009, we can, by conducting a visual inspection of the plots in Figs. 6-5 – 6-10, qualitatively assess whether these constructions become concentrated in a particular genre or not.

To substantiate the impressionistic observations by quantitative means, one can[40] find the second moments of the probability distributions in question (not to be confused with the second moment of the involved variable), which we will now treat as a measure of genre-related concentration and simply refer to as *concentration*. In basic terms, this measure is the sum of squares of all given probabilities. For example, the probabilities (expressed in percentages) for *in order that* to occur in the four genres of COHA in 1860 are (they sum up to 100%): 8.66%, 28.23%, 29.73% and 33.38% (see Table 6-4). Squares of these four numbers are: 0.7500%, 7.9693%, 8.8387%, 11.1422% respectively, so that their sum equals 28.7003%.

The values of concentration may vary between the reciprocal (one divided by the number of the items we have) of the number of probabilities, which is the minimum, and the maximum which is equal to 100%. Here we deal with four genres, so the minimum equals 25%. If the value of concentration is close to its minimum, this means that the probabilities are more or less even. On the other hand, when the value of concentration is higher (closer to 100% than to the minimum of 25%), most of the probability is assigned to a single genre. In the discussed example of *in order that* in 1860 the probability distribution was rather even for three genres and substantially smaller for the fourth one. Quite intuitively, such a scenario is characterised by a low value of concentration, namely 28%, which is very close to the minimum. Note that we do not point to any particular genre, it is only the process of concentration itself that is addressed. Table 6-5 sums up the results for the six variants we look at, while Figure 6-11 presents the results in the form of six line plots.

Decade	**The value of concentration across time**					
	in order to	***in order that***	***so as to***	***lest***	***in order not to***	***so as not to***
1860	28.09%	28.7%	27.92%	27.7%	51.17%	27.7%
1870	28.38%	32.15%	33.01%	27.95%	25.11%	27.95%
1880	28.09%	31.91%	26.31%	28.05%	38.54%	28.05%
1890	28.09%	29.64%	26.21%	28.37%	33.06%	28.37%
1900	30.25%	29.91%	31.43%	25.92%	54.98%	25.92%
1910	30.25%	28.44%	27.69%	26.56%	30.2%	26.56%
1920	29.16%	30.22%	30.68%	27.56%	27.02%	27.56%

[40] Below it is explained why this is a good choice.

1930	31.36%	35.19%	31.95%	27.89%	25.57%	27.89%
1940	30.25%	35.98%	32.05%	25.53%	26.2%	25.53%
1950	34.81%	38.01%	39.43%	25.95%	29.96%	25.95%
1960	36%	34.57%	38.46%	25.88%	28.56%	25.88%
1970	33.64%	43.31%	34.98%	26.12%	29.43%	26.12%
1980	34.81%	48.89%	36.47%	27.28%	32.02%	27.28%
1990	36%	44.16%	48.87%	26.4%	27.33%	26.4%
2000	34.81%	74.55%	36.83%	32.04%	41.22%	32.04%

Table 6-5: The values of concentration for each variant across the time period 1860-2009.

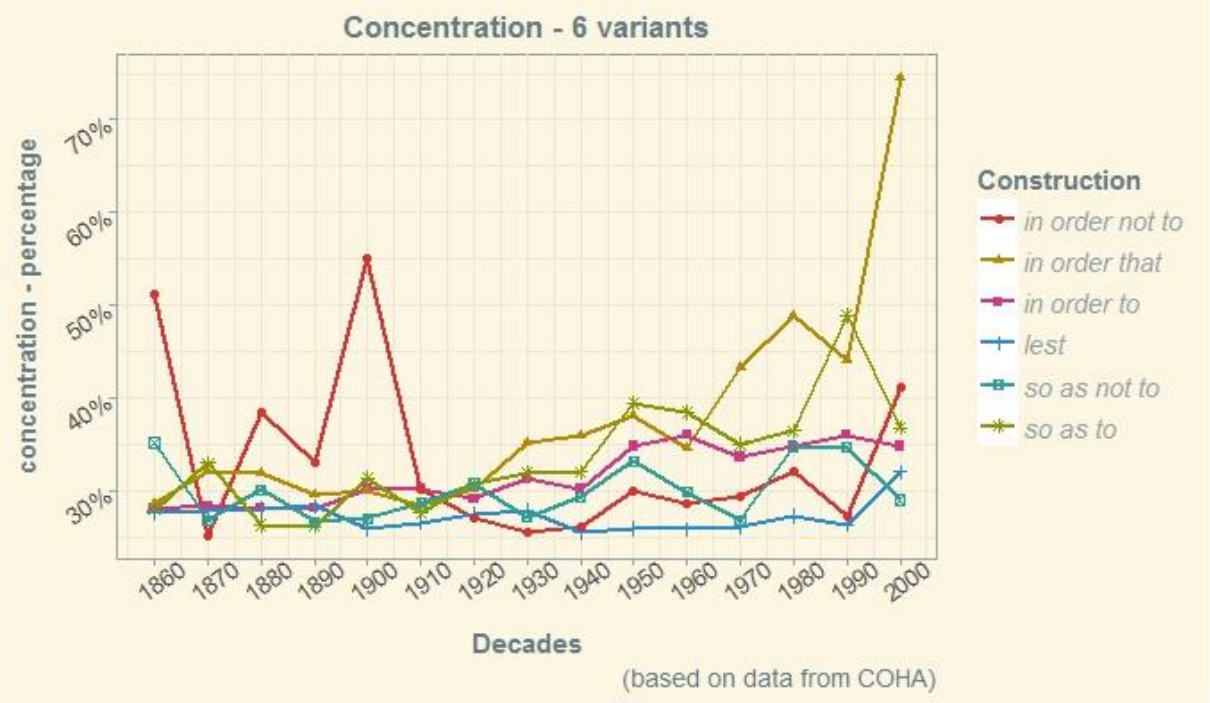


Fig. 6-11: Genre-related concentration of the six variants across the time period 1860-2009.

As we can see, the highest diachronic genre-related concentration can be observed for *in order that*, which should not come as a surprise given the tendency towards the dominance of the *non-fiction* genre visible in Fig. 6-9 and Table 6-4. In the case of *in order to* and *so as to*, there is also an observable upward trend. *Lest*, on the other hand, presents the most stable pattern, whereas both *in order not to* and *so as not to* do not show any conclusive trends. Their line plots are full of fluctuations – sudden surges and correspondingly sudden

drops. If we remove the both negative variants of *in order to* and *so as to* from the chart, we get a much less chaotic picture – see Fig. 6-12.

For the three constructions which show some degree of increase in the genre-related concentration over time, namely *in order that*, *in order to* and *so as to*, the early decades of the twentieth century are the exact point in time at which the trend of change starts.

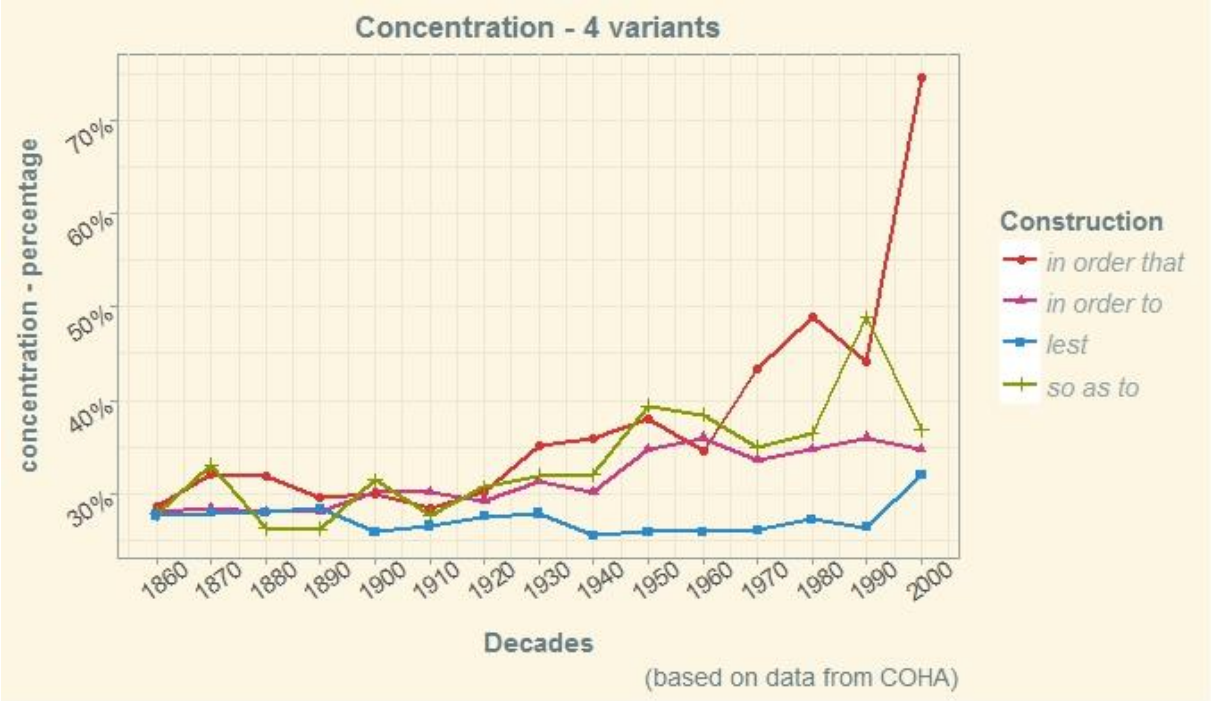


Fig. 6-12: Genre-related concentration of the four variants across the time period 1860-2009.

6.2.4 Conclusions

The results obtained in the present section show that for the three out of six constructions which were investigated, there is a tendency towards distributional fragmentation. *In order to* (see Fig. 6-5), *in order that* (see Fig. 6-9) and *so as to* (see Fig. 6-7) have all been increasingly restricted to texts belonging to the *non-fiction* genre of COHA. In the first few decades of the study period, from approximately decade 1860 to 1900, the distribution of the instances of particular constructions was much more even across the genres. The trend towards a higher degree of genre-related concentration starts no sooner than in the early decades of the twentieth century (see e.g. 6-11 and 6-12).

In the case of *lest*, *in order not to* and *so as not to*, no conclusive trends towards a growing distributional fragmentation or genre-related concentration have been detected.

This might mean that either there is no such trend or, for instance in the case of *lest*, the situation would look differently if, instead of four genres of *fiction, magazine, newspaper* and *non-fiction*, we had topical domains distinguishing between topics such as religion and philosophy or science-fiction and fantasy (see Section 6.1.3 and 6.1.4).

The fact that we observe a tendency towards distributional fragmentation among the investigated purpose subordinators and that in the past the constructions in question did seem to be more or less evenly distributed across the different genres might be something which differentiates the purpose subordinators from e.g. adverbial connectors, as according to Lenker (2010: 247) they have always seemed to prevail in genres such as academic prose:

> Adverbial connectors in particular work as linguistic signposts, guiding the reader through a text. Accordingly, they have – in all periods of English – been particularly frequent in genres such as ACADEMIC PROSE, which puts an emphasis on conveying logical coherence and whose main communicative purpose is information, argumentation and explanation for a specialist audience.

6.3 Collostructional analysis: collexeme analysis and semantic tagging

As Stefanowitsch (2013: 290) explains, collostructional analysis is a family of corpus-linguistic methods that can be used "for studying the relationships between words and the grammatical structures they occur in". There are three well-known variants of collostructional analysis, namely simple collexeme analysis, distinctive collexeme analysis, and covarying collexeme analysis. Simple collexeme analysis investigates the relation of co-occurrence between pairs of constructions. Usually, one of the items in question is a grammatical construction and the other a lexical one (e.g. a word). The aim of this method is to determine the kind and strength of association between the two constructions. If some of the lexical constructions are significantly more frequent (in relation to the first, usually grammatical, construction) than one would expect on the basis of their overall frequency in the corpus, they are referred to as *significantly attracted collexemes*. If, on the other hand, some e.g. words are significantly less frequent, they are referred to as *significantly repelled collexemes* (Stefanowitsch 2013). Distinctive collexeme analysis compares the collocates of two nearly synonymous words with regard to the frequencies with which these collocates occur with the two words. The aim of the analysis is different here: this time the words which distinguish the two nearly synonymous

words from each other are picked up. An example of a distinctive collexeme analysis is a comparison between the American English and British English variants of *quite* + ADJ construction (Levshina 2015: 241). Covarying collexeme analysis sees a given construction as "a frame in which potential associations of pairs of words are studied" (Stefanowitsch 2013: 298). An example is provided by the study of Gries and Stefanowitsch (2004) in which the interaction between two slots in the causative construction of [X V_1 Y *into* $V_{2\ gerund}$] is investigated. Both in distinctive collexeme analysis and in covarying collexeme analysis the overall corpus frequency is ignored.

The present section applies simple collexeme analysis to study of one potentially obsolescent variant, namely *in order to*. The analysis is conducted at three different points in time with an aim of obtaining three different lists of most strongly attracted collexemes and comparing them with each other. The goal is to see whether the words attracted by this construction have changed over the years or whether they have stayed the same.

6.3.1 In order to*: Data and Methodology*

Even though *in order to* is not the variant showing the steepest form of decrease in the frequency of use (see Fig. 4-2), it does present a negative correlation between time and frequency of use (see Table 4-3). Moreover, it seems to be preferred in more elaborate text genres such as *academic texts* (see Fig. 6.1), and it is apparently becoming increasingly restricted to one particular genre (see Fig. 6-5). As has already been said, the main aim is to check whether the most strongly attracted collexemes of the construction *in order to* have changed over the decades. An assumption behind this research question is that a change in the selection of close collocates might tell us something about how freely the construction in question has been used across its history, and whether, with time, it has become more restricted to less general and potentially more specialised collocates and concrete ranges of meaning.

This could be regarded as the semantic correlate of distributional fragmentation (see e.g. Section 6.2). If an obsolescent construction is becoming more restricted to certain genres and kinds of texts maybe it also becomes more restricted to certain contexts and ranges of meanings.

Another point in favour of the use of *in order to* is that collostructional analysis can lead to dubious results if done for a construction which is very strongly decreasing in frequency of use, such as, e.g., *in order that*[41].

Three points in time in the period represented by COHA (1810-2009) are selected, namely 1830, 1900 and 2000. The first two decades represent the period during which the frequency of use of *in order to* seems relatively stable (see Fig. 4-2). The frequency of use oscillates between 80 and 94 words per million and there is neither a trend of increase nor a trend of decrease. Thus, the first two chosen points in time seem a good choice with regard to looking at the most strongly attracted collexemes of *in order to* in the period of relative stability and popularity. Decade 2000, on the other hand, represents the moment in time in which *in order to* reaches its lowest frequency in the studied period.

To obtain the list of most strongly attracted collexemes at the three points in time, a collostructional analysis of the collocates of *in order to* is conducted for each of the three decades. The program used for the analysis is called Coll.analysis 3.2a for R for Windows (Gries 2007). After running the program in R, we are asked for data that are needed for the analysis such as the size of the corpus and the (raw) frequency of a given construction in the corpus. In our case each of the three chosen decades is treated as a separate corpus – so the size of the corpus for the decade 2000 is the size (in words) of this decade in COHA. Similarly, the frequency of use of a given construction is its frequency in just the decade in question. The next query we get from the program is about the index of association strength we want to compute, the default for which is *Fisher-Yates exact*. The program then requires us to upload a text file containing a table with the collocates of a given construction and the frequencies of use of these collocates: both in the corpus, and in the direct neighbourhood of the construction. Fig. 6-13 presents a screenshot of the output we get from Coll.analysis 3.2a.

The two following questions we get concern the output of the analysis – its format and location of storage.

[41] In the decade 2000 of COHA (which itself contains almost 30 million words) there are only 20 instances of *in order that*.

```
To compute the collocational strength of one word W to many other words <A, B, ..., ?>,
you need a text file with the following kind of table (with column names!):

Word    Freq_A-?_in_Corpus      Freq_A-?_&_W
A       ...                     ...
B       ...                     ...
...     ...                     ...
```

Fig. 6-13: Screenshot of Coll.analysis 3.2a – format of table with collocates.

For each of the selected decades, a table such as the one presented in Fig. 6-13 is prepared. The minimum frequency value is set at 2, so a given word must have occurred at least twice just after the *in order to* pattern. So, to sum up, our search for most strongly attracted collexemes of *in order to* is limited to its immediate infinitival collocates.

6.3.2 In order to*: Results and Discussion*

The output of the analysis is stored in a text file. It contains a few words of explanation of the values we get – such as the observed frequency of a given collocate (word) in the corpus and in the direct vicinity of the construction and the expected frequency of the word in/with the construction in question. The last column of the output file contains the value representing collocational/collostructional strength, which can be interpreted as "the higher the strength, the stronger the attraction". Since we only are interested in the verbs attracted to *in order to*, and not the ones which are repelled by it, we only talk about the relation in terms of attraction.

Table 6-6 contains the 25 most strongly attracted verbs for each of the studied decades. Even though the verbs differ with regard to the exact values of attraction, they can all be looked at as significantly attracted collexemes of *in order to*. The exact values of collocation/collostructional strength are of secondary importance here, since the question was not about the exact values, but about the selection of verbs themselves. All of the results included in the Table 6-6 are statistically significant since, according to the output of the analysis, one could also interpret the collostructional strength in terms of p-values: "If your collostructional strength is based on p-values, it can be interpreted as follows: coll.strength>3 => p<0.001; coll.strength>2 => p<0.01; coll.strength>1.30103 => p<0.05."

1830	**Coll. strength**	**1900**	**Coll. strength**	**2000**	**Coll. strength**
AVOID	67.05	GET	128.98	MAKE	65.59
ASCERTAIN	66.58	MAKE	120.63	GET	64.67
SECURE	66.5	AVOID	112.19	AVOID	63.84
MAKE	63.88	KEEP	97.99	SAVE	44.93
GIVE	60.68	SECURE	89.73	KEEP	43.15
OBTAIN	43.97	OBTAIN	76.71	SURVIVE	41.23
PREVENT	41.97	PREVENT	69.71	BE	40.89
SHOW	40.58	SAVE	65.06	MAINTAIN	36.56
RENDER	31.06	BE	52.08	PREVENT	31.67
GET	31.05	GIVE	48.34	CREATE	27.19
KEEP	30.85	SHOW	48.31	HELP	25.61
PRESERVE	28.17	PRESERVE	38.93	PROTECT	25.27
BE	23.4	REACH	33.98	PROVIDE	24.96
ENABLE	16.86	FACILITATE	28.59	UNDERSTAND	22.40
PRODUCE	16.66	BRING	28.20	PRESERVE	21.64
SAVE	15.56	PROVIDE	26.89	PROMOTE	18.68
PROVE	15.52	INSURE	25.75	IMPROVE	17.98
UNDERSTAND	14.89	CARRY	25.74	DETERMINE	16.94
RELIEVE	14.17	GAIN	24.92	GAIN	16.52
SUSTAIN	13.37	FIND	23.29	SATISFY	16.37
REDUCE	13.32	ASCERTAIN	23.25	PAY	15.81
BRING	12.96	UNDERSTAND	23.04	MEET	15.59
TAKE	12.39	MAINTAIN	22.37	FACILITATE	14.71
ENSURE	12.16	ESCAPE	21.83	DEVELOP	13.62
CARRY	12.04	ESTABLISH	21.76	FIND	13.58

Table 6-6: Twenty five most strongly attracted collexemes of *in order to* in 1830, 1900 and 2000.

Contrary to the expectations, the most strongly attracted collocates do not seem to have changed much over the years. Verbs *make*, *get*, *be*, *avoid*, *keep*, *preserve*, *prevent* and *understand* can be found among the most attracted collocates for all the investigated points in time. The differences between decades are also far from being striking. Moreover, a

visual inspection of results with the use of USAS semantic English tagger[42], does not show any shifts of semantic connotations of the collexemes. Table 6-7 shows the verbs from Table 6-6 for 2000 and 1900, together with the indications of their semantic subcategories[43].

As we can see in Table 6-7, the highest number of verbs in both 1900 and 2000 has, at least as one of its meanings, the category A9+ which, according to the website explaining the semantic tags used by USAS (http://ucrel.lancs.ac.uk/usas/semtags_subcategories.txt) is to be associated with *getting and possession*. The second most frequent sematic tag is S8+, which is explained as having to do with the action of *helping*. A9-, which is also attested a few times among the tags, indicates words which convey the meaning of *giving*, whereas category T2+ is associated with *time and beginning*.

2000	**Semantic tags**	**1900**	**Semantic tags**
MAKE	A1.1.1 **A9+** A2.2 S6+ **A3+** A9- X9.2+ X6+	GET	**A9+** Z5 X9.2+ A2.1+ A2.2 M1 M2 **X2.5+** E4.1-
GET	**A9+** Z5 X9.2+ A2.1+ A2.2 M1 M2 **X2.5+** E4.1-	MAKE	A1.1.1 **A9+** A2.2 S6+ **A3+** A9- X9.2+ X6+
AVOID	**A1.9** M1	AVOID	**A1.9** M1
SAVE	I1.1 B3 **A9+** **S8+** **A1.9** K5.1 S9	KEEP	**A9+** N6+ **T2++** A1.7+ A2.2 F4 **S8+** H4
KEEP	**A9+** N6+ **T2++** **A1.7+** A2.2 F4 **S8+** H4	SECURE	A7+ A15+ **A1.7+** E6+
SURVIVE	**A3+**/**T2++** L1+	OBTAIN	**A9+**
BE	**A3+** Z5	PREVENT	**S8-**
MAINTAIN	**A9+** **T2++** **S8+** A1.1.1 Q2.2	SAVE	I1.1 B3 **A9+** **S8+** **A1.9** K5.1 S9
PREVENT	**S8-**	BE	**A3+** Z5
CREATE	A1.1.1 A2.2 E1	GIVE	**A9-** A1.1.1
HELP	**S8+**	SHOW	A8 K4 S1.1.1 I2.2/S1.1.1
PROTECT	**S8+**/A15+ A10-	PRESERVE	**S8+** **A9+**/A2.1- F1 L2
PROVIDE	**A9-** S6+	REACH	N3.3 X9.1+
UNDERSTAND	**X2.5+**	FACILITATE	**S8+**
PRESERVE	**S8+** **A9+**/A2.1- F1 L2	BRING	**M2** A2.2

[42] USAS English tagger, available online at http://ucrel.lancs.ac.uk/usas/tagger.html.
[43] The explanations of semantic categories available at http://ucrel.lancs.ac.uk/usas/semtags_subcategories.txt.

PROMOTE	S8+ I2.2/Q2.2 S7.1+/A2.1	PROVIDE	A9- S6+
IMPROVE	A5.1+/A2.1	INSURE	I1/A15-
DETERMINE	A2.2 A7+ X6+	CARRY	M2 A9+ Q4 S7.4+ B1% B2-%
GAIN	A9+ N5+/A2.1	GAIN	A9+ N5+/A2.1
SATISFY	E4.2+ A1.2+	FIND	A10+ **X2.1** X6+
PAY	I1.1/I3.1	ASCERTAIN	**X2.3+**
MEET	S3.1 M6 A1.1.1 X9.2+ A6.1+	UNDERSTAND	**X2.5+**
FACILITATE	S8+	MAINTAIN	A9+ T2++ S8+ A1.1.1 Q2.2
DEVELOP	A2.1+ T2+ A5.1+/A2.1 N3.2+/A2.1 H1 A9+ C1	ESCAPE	A1.7- O2
FIND	A10+ **X2.1** X6+	ESTABLISH	T2+ X6+

Table 6-7: Twenty five most strongly attracted collexemes of *in order to* in 1900 and 2000: semantic categories indicated.

All in all, on the basis of the collostructional analysis enriched with semantic tagging, *in order to* does not seem to present any kind of shift across time when it comes to its most strongly attracted collocates. There is, however, one more interesting aspect of the words included in Tables 6-6 and 6-7. Many of them might be pointed to as representing Latin-based verbs, thus having a higher degree of overall formality, as stated by e.g. Lorenz (2013: 138) who writes that "words of Latin, as opposed to Germanic origin are generally associated with higher degrees of formality". How to choose a unified approach towards defining verbs that could count as Latin-based? Lorenz (2013: 139) selects a set of morphemes to indicate the Latin origin of a given word: "These Latin-based morphemes are the prefixes: *con-*, *de-*, *dis-*, *ex-*, *in-*, *per-*, *pre-*, *pro-* and *re-*, and the suffixes *-ate*, *-ize*, *-tion* and *-ure*". The approach of Lorenz is adopted by the present work, and the situation in which a verb is identified as having a Latin origin is treated as an indication of it having a higher degree of formality.

In the decade 2000, nine verbs are identified as Latin-based, namely: *prevent*, *create*, *protect*, *provide*, *preserve*, *promote*, *determine*, *facilitate*, *develop*. In the decade 1900, six verbs seem to have Latin origin: *secure*, *prevent*, *preserve*, *facilitate*, *provide*, *insure*. For the decade 1830 there are nine such verbs again: *secure*, *prevent*, *render*, *preserve*, *produce*, *prove*, *relieve*, *reduce*, *ensure*.

Could this mean that verbs of Latin origin are, to some extent, overrepresented among the most strongly attracted collexemes of *in order to*? A quick search for the most frequent *to*-infinitives in the COHA[44] decade of 2000 reveals that there is not a single Latin-based word among the first twenty-five results. Furthermore, the result is still the same if we take the first fifty most frequent *to*-infinitives and search for verbs having any of the prefixes and suffixes indicated by Lorenz (2013: 139). The same search has been repeated for the decade 1900, and among the first fifty most frequent *to*-infinitives two Latin-based verbs have been discovered, namely *prevent* (rated as 48th most frequent *to*-infinitive) and *secure* (rated as 49th most frequent *to*-infinitive). Furthermore, in the decade of 1830, there were 5 such verbs, to be specific *prevent*, which has been rated as the 28th most frequent *to*-infinitive, *produce* rated as the 39th, *render* (the 40th), *secure* (the 42nd) and *remain* (the 46th).

This apparent overrepresentation of Latin-based verbs among the most strongly attracted collexemes of *in order to* might very well mean that the construction in question has always attracted verbs characterised by a higher degree of formality. The fact that the Latin-based verbs are attested among the first most frequent *to*-infinitives in the decades of 1830 and 1900 but not in the decade of 2000 might also suggest that the observed decrease of *in order to* could have to do with the general decrease in popularity of the verbs of Latin origin. Or, the other way round, the decrease in popularity of the Latin-based verbs might be related to the decrease in frequency of *in order to*, which has always taken these verbs as collocates. These two contradictory hypotheses will be addressed again in Section 8.1.3 of the present work.

6.3.3 Conclusions: Collexeme analysis of in order to

Contrary to expectations, the simple collexeme analysis of the collocates of *in order to* did not show any signs of semantic shift across the three time points of 1830, 1900 and 2000. The most strongly attracted collexemes are very similar in each of the decades (see Tables 6-6 – 6-7). However, the fact that 36% of the 25 most strongly attracted collexemes for 1830 and 2000 can be classified as Latin-based does seem an interesting observation and might mean that *in order to* has, maybe even since the beginning of its history, had a preference towards verbs of higher degree of formality.

[44] Data retrieved from COHA on January 17th 2018.

6.4 Summary

The present chapter has addressed the question whether the constructions investigated in the present work are subject to genre-related constraints which might be seen as symptoms of obsolescence. First, the phenomenon of distributional fragmentation has been addressed in the synchronic view, with the use of contemporary English data from COCA (see Section 6.1). Each of the constructions has been shown to have some degree of preference towards particular genre – in most cases, namely for *in order to*, *in order that* and *so as to*, it was the genre of *academic texts*, whereas in the case of *lest*, it was a certain topical domain – texts dealing with *religion* and *philosophy*.

Section 6.2 charts the processes of distributional fragmentation and the resulting genre-related concentrations. To compensate for genre imbalances in part of the data (COHA), a novel calculation method was introduced which was based on extrapolated frequencies of use (see Section 6.2.1). One of the advantages of this methods was the fact that the overall decrease in the frequency of use, which is the case for all the investigated variants, does not interfere with the observations to be made. According to the results, which were based on the diachronic data from COHA, the distribution of *in order to*, *in order that* and *so as to* changes over time in the direction of greater concentration in the *non-fiction* genre, which can be treated as a rough equivalent of the *acedmic texts* genre from COCA.

However, the third study presented in this chapter, namely a collostructional analysis of most strongly attracted collexemes of *in order to* (see Section 6.3), did not show any kind of shift over the decades in terms of semantic connotations expressed by the collocates of *in order to*. The analysis has been conducted at three different points in time, which were the decades 1830, 1900 and 2000 of COHA, and, contrary to expectations, not many changes in terms of the collexemes attracted by *in order to* have been observed. Nevertheless, a tendency which has to be noted is the apparent overrepresentation of Latin-based verbs among the first 25 most strongly attracted collexemes in comparison to the list of most frequently used *to*-infinitives in each of the tested decades. This observation will be addressed again in Section 8.1.3.

7. Paradigmatic atrophy

Use it or lose it

The present chapter aims at looking for signs of paradigmatic atrophy in the network of subordinators of purpose. Among the developments which might be considered as paradigmatic atrophy there are e.g. "the increasing rarity of the negative contraction in *–n't* with some (though not all) modals" (Leech et al. 2009: 81), or the fact that *shall* is "now almost completely restricted to first person subjects" (Traugott & Trousdale 2013: 67; Leech et al. 2009). While both of these phenomena are verb-related, the adjustment of this potential sign of obsolescence to a network of subordinators seems somewhat tricky. It is simply not possible to talk about subordinators in terms of present/preterite alternations, morphological variability or contrasts of person and number, i.e. the modifications which make up the paradigmatic potential of a verb.

Still, I will argue that there are at least two properties of purpose subordinators which define a corridor of variability which is at least comparable to paradigmatic variability observed in verbs and nouns. These properties are i) the frequency trend concerning their negative forms (such as e.g. *in order not to* or *in order that … not*) and ii) the functional alternations depending on the position of subordinators in a sentence. While the former one probably seems clear, some words of explanation need to be said about the latter.

According to studies by e.g. Winter (1982); Thompson (1985); Ford & Thompson (1986) and Ford (1993), adverbial subordinators (and among them purpose subordinators) might have very different functional scopes, depending on whether they take an initial or a final position in a sentence. As Biber (1988: 235) says:

> Several studies […] separate preposed from postposed adverbial clauses and find that these two types have different scopes, functioning to mark global versus local topics, and that they have different distributions.

Along similar lines, and with regard to purpose subordinators in particular, Ford (1993) claims after Thompson (1985) that if an adverbial clause of purpose serves to introduce a

certain problem (or a *global* topic), it is usually found before the clause(s) which explain it or present a solution, so in an initial position.

In contrast to this, final purpose clauses usually serve a different function, namely the introduction of a more *local* topic, as Ford states (1993: 14):

> In contrast to the function of initial purpose clauses, final purpose clauses serve to delimit the interpretation of only the immediate main clauses to which they are joined and they do not respond to any expectation that a problem exists. They simply state the purpose or goal of some action in the main clause.

Also Schmidtke-Bode (2009: 126) makes a distinction between the different functions fulfilled by the purpose clauses occupying different positions, i.e. he attributes a "focal, rhematic function of motivating the event in the matrix clause" to the final purpose clauses, whereas if they are found in initial position, their discourse function becomes different – they "assume a thematic role in the ongoing discourse".

Thus, the present chapter sees purpose subordinators used in initial and in final positions as different variants of the same constructions. The frequency trends concerning these different variants will be looked at in Section 7.1. The aim is to investigate whether there are any signs of a diachronic trend which might be treated as a symptom of paradigmatic atrophy such as e.g. absence of a previously attested variant in initial position in the later decades.

Section 7.2 focuses on the diachronic frequency trends concerning the negative versions of subordinators of purpose, namely *in order not to*, *in order that (not)*, *so as not to*. Here, too, a disappearance or a decrease in the frequency of use of a previously attested negative variant might indicate that the construction's paradigmatic potential is shrinking.

7.1 Initial vs. final position of purpose subordinators

In a large cross-linguistic study, Diessel (2001: 446) claims that English purpose and result clauses are typically postponed, whereas conditional clauses are preposed, which he sums up using a schematic presentation of the positions taken and preferred by particular types of adverbial clauses (see Fig. 7-1).

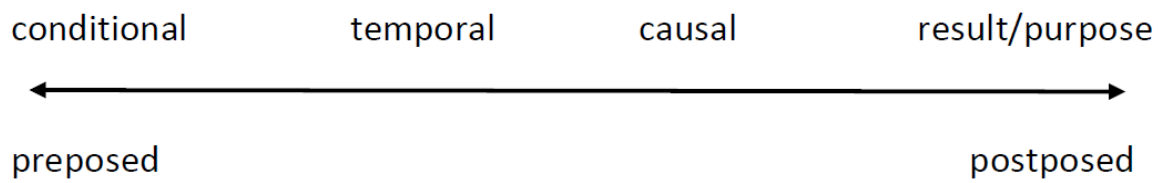


Fig. 7-1: Ordering hierarchy of adverbial clauses (Diessel 2001: 446).

The schematic representation by Diessel is based on his corpus study (2001: 444) of positional patterns of conditional, temporal, causal and result/purpose clauses in the Brown corpus, the results of which are presented in Table 7-1. For each clause type particular subordinators were chosen to represent it, namely: *if* (conditional clauses); *when, after, before* (temporal); *because* (causal); *so that* (result); *in order to* (purpose). As we can see in Table 7-1, for purpose clauses 1% of all the instances (1 out of 85 in total) was located in front of the matrix clause and 99% after the matrix clause. For clauses of result the prevalence of final position is even stronger, with 100% of the instances occupying the final position. Conditional clauses are the only category with a seemingly even distribution – 53% are located in front of a matrix clause, 47% after it. For both the temporal and causal clauses, the preferred order is postponed, with some instances taking the initial position as well (18,5% and 5,5% for both types respectively).

	Conditional	Temporal	Causal	Result	Purpose
Initial	435 (53%)	361 (18.5%)	30 (5.5%)	- (0%)	1 (1%)
Final	387 (47%)	1604 (81.5%)	511 (94.5%)	227 (100%)	84 (99%)
Total	822 (100%)	1965 (100%)	541 (100%)	227 (100%)	85 (100%)

Table 7-1: Conditional, temporal, causal, result, and purpose clauses in the Brown corpus (Diessel 2001: 444).

The results presented in Table 7-1 clearly show that the preferred position of purpose clauses is final. However, with regard to paradigmatic atrophy, we could ask whether it "has it always been like that?". Brown is a relatively young corpus of American English, containing samples of texts from approximately the middle of the twentieth century (1961

to be precise). As we have seen in e.g. Table 4-2, most of the subordinators of purpose have already started to show a definite trend of decrease in the frequency of use. *In order to*, which is the only subordinator of purpose selected by Diessel to represent the category of purpose clauses (2001: 444), has also started to decrease, though this decrease has not been as pronounced as for *so as to*, *in order that* or *lest*.

The present section looks at the diachronic frequency developments with regard to positions occupied by particular subordinators of purpose across the time period of 1810-2009.

7.1.1 Data and Methodology

For each of the subordinators, a few corpus searches have been done to extract the (raw) numbers of subordinators in question in both preposed and postposed positions. To find as many instances of *in order to* in initial position as possible, the patterns ". in order to", "? in order to", "! in order to" were, one by one, entered into the search box of the COHA interface. Full stops, question and exclamation marks followed by a space and *in order to* (or *so as to*, *lest* and *in order that*) mostly capture instances of a given construction in sentence initial position, such as (54), (55) and (56):

(54) *<u>In order to</u> connect the Polar discoveries of Franklin eastward from Coppermine River and the late discoveries of Parry by which the whole line of coast might be made out, the Government determined to send the Griper, under the command of Captain Lyon, to Repulse Bay.* (COHA: 1850; MAG: American Whig Review: "Sir John Franklin and the Arctic Expeditions")

(55) *<u>In order to</u> get productivity, we bring these orders into as logical a program of production as we possibly can.* (COHA: 1950; NF: "Small Plant Management")

(56) *<u>In order to</u> globalize safely, countries should abandon monetary nationalism and abolish unwanted currencies, the source of much of today's instability.* (COHA: 2007; NF: "The End of National Currency")

This procedure is repeated for each of the studied subordinators (*in order to*, *in order that*, *so as to*, *lest*) and the raw numbers for initial position are then subtracted from the total (raw) number of instances of a given subordinator per each decade. The next step involves turning these raw numbers into percentages representing the fractions of the whole taken by subordinators in each of the two positions in question. Also, a genre-related component will be added, to compare the trends of distributions between genres represented in COHA (see Section 2.4.1) for some of the variants.

Even though the pattern of input, namely punctuation mark followed by a space and subordinator, proposed in the present section to limit our search to only the subordinators in the initial position, seems to be working very effectively, one has to mention one of the possible limitations. If the subordinator in initial position was not preceded by any punctuation mark, but for instance by a title, a number, a tag, or it simply happened to constitute the beginning of a completely new text file, it would stay unrecognised. Such cases, however, do not seem to be very likely and it is assumed that given the size of the corpus, the results obtained with the method described shall indeed show any trends present.

7.1.2 Results and Discussion

Firstly, for each of the subordinators in question the (raw) numbers of instances in initial and final position are extracted from the COHA. Secondly, the numbers are changed into percentages, to show what proportion of the overall number of instances of a given subordinator per given decade was used in the initial and in the final position. Thirdly, a visual inspection of the results has to take place, in order to see whether there are any trends visible.

The results are presented in the form of tables, the last two columns to the right show the percentage of instances in initial and final positions. Table 7-2 presents the results for *in order to*, 7-3 for *so as to*, 7-4 for *in order that* and 7-5 for *lest*.

Decade	***in order to* initial position**	***in order to* final position**	***in order to* total**	***in order to* initial position** (percentages)	***in order to* final position** (percentages)

	(raw number)	(raw number)	(raw number)		
1810	15	93	108	13.89%	86.11%
1820	58	575	633	9.16%	90.84%
1830	123	1157	1280	9.61%	90.39%
1840	133	1254	1387	9.59%	90.41%
1850	126	1317	1443	8.73%	91.27%
1860	117	16	133	8.8%	91.20%
1870	126	35	161	7.83%	92.17%
1880	143	1534	1677	8.53%	91.47%
1890	183	1569	1752	10.45%	89.55%
1900	227	1803	2030	11.18%	88.82%
1910	275	1868	2143	12.83%	87.17%
1920	221	1787	2008	11.01%	88.99%
1930	261	1869	2130	12.25%	87.75%
1940	173	1705	1878	9.21%	90.79%
1950	183	1422	1605	11.4%	88.60%
1960	171	1577	1748	9.78%	90.22%
1970	187	1614	1801	10.38%	89.62%
1980	151	1516	1667	9.06%	90.94%
1990	144	1604	1748	8.24%	91.76%
2000	112	1421	1533	7.31%	92.69%

Table 7-2: Distribution of *in order to* in initial and final position across decades.

As we can see in Table 7-2, the figures we obtain from COHA look slightly different from the results of Diessel (2001: 444), obtained with the use of the Brown corpus, as he detected only a single (1%) instance in the initial position compared with 85 (99%) in the final position (see Table 7-1). In the decade of 1960 in COHA, which should best correspond to the result of Diessel, the instances of *in order to* in the initial position constitute almost 10% of all the cases. Naturally, this might result from the larger amount of data in COHA (the decade of 1960 in COHA is twenty-four times the size of the Brown corpus), which might have a fluctuation-smoothing effect.

To sum up, for the whole time period represented by the COHA corpus, the percentages of *in order to* positioned in the beginning of a sentence oscillate between 7.3% and 13.9%. These values are higher for *in order to* than for *so as to* (Table 7-3), which has the lowest number of instances used in initial position, with percentage figures falling in the range of 0% to 1.54%. The results for *in order that* (Table 7-4) are more similar to *in order to* – they in general seem to fall in the range between 6.5% and 11.9%, the lowest value being, however, 0% for the decades of 1810 and1990, and the highest 17.24% for 1980. In the case of *lest* (Table 7-5), the percentage of instances used in the initial position is higher than it was in the case of *so as to*, but lower than for *in order to* and *in order that*. The lowest value is 0.7% in the decade of 1820, the highest 8.18% in 1990.

Decade	***so as to* initial position** (raw number)	***so as to* final position** (raw number)	***so as to* total** (raw number)	***so as to* initial position** (percentages)	***so as to* final position** (percentages)
1810	0	9	9	0%	100.00%
1820	1	266	267	0.37%	99.63%
1830	5	787	792	0.63%	99.37%
1840	2	835	837	0.24%	99.76%
1850	0	914	914	0%	100.00%
1860	1	785	786	0.13%	99.87%
1870	2	946	948	0.21%	99.79%
1880	3	785	788	0.38%	99.62%
1890	3	775	778	0.39%	99.61%
1900	3	715	718	0.42%	99.58%
1910	5	690	695	0.72%	99.28%
1920	4	605	609	0.66%	99.34%
1930	5	487	492	1.02%	98.98%
1940	4	369	373	1.07%	98.93%
1950	2	268	270	0.74%	99.26%
1960	3	346	349	0.86%	99.14%
1970	4	255	259	1.54%	98.46%
1980	2	216	218	0.92%	99.08%

1990	1	165	166	0.60%	99.40%
2000	0	143	143	0%	100.00%

Table 7-3: Distribution of *so as to* in initial and final position across decades.

Decade	***in order that* initial position** (raw number)	***in order that* final position** (raw number)	***in order that* total** (raw number)	***in order that* initial position** (percentages)	***in order that* final position** (percentages)
1810	0	12	12	0.00%	100.00%
1820	3	77	80	3.75%	96.25%
1830	18	207	225	8.00%	92.00%
1840	17	245	262	6.49%	93.51%
1850	17	231	248	6.85%	93.15%
1860	25	274	299	8.36%	91.64%
1870	21	318	339	6.19%	93.81%
1880	46	291	337	13.65%	86.35%
1890	23	319	342	6.73%	93.27%
1900	49	365	414	11.84%	88.16%
1910	39	394	433	9.01%	90.99%
1920	34	404	438	7.76%	92.24%
1930	25	274	299	8.36%	91.64%
1940	25	185	210	11.90%	88.10%
1950	9	122	131	6.87%	93.13%
1960	6	71	77	7.79%	92.21%
1970	5	47	52	9.62%	90.38%
1980	5	24	29	17.24%	82.76%
1990	0	22	22	0.00%	100.00%
2000	1	19	20	5.00%	95.00%

Table 7-4: Distribution of *in order that* in initial and final position across decades.

Decade	***lest* initial position** (raw number)	***lest* final position** (raw number)	***lest* total** (raw number)	***lest* initial position** (percentages)	***lest* final position** (percentages)
1810	3	55	58	5.17%	94.83%
1820	3	424	427	0.70%	99.30%
1830	19	617	636	2.99%	97.01%
1840	29	732	761	3.81%	96.19%
1850	14	729	743	1.88%	98.12%
1860	23	671	694	3.31%	96.69%
1870	21	622	643	3.27%	96.73%
1880	13	680	693	1.88%	98.12%
1890	21	697	718	2.92%	97.08%
1900	13	597	610	2.13%	97.87%
1910	18	589	607	2.97%	97.03%
1920	28	523	551	5.08%	94.92%
1930	18	447	465	3.87%	96.13%
1940	13	323	336	3.87%	96.13%
1950	17	291	308	5.52%	94.48%
1960	12	202	214	5.61%	94.39%
1970	18	258	276	6.52%	93.48%
1980	14	216	230	6.09%	93.91%
1990	13	146	159	8.18%	91.82%
2000	11	179	190	5.79%	94.21%

Table 7-5: Distribution of *lest* in initial and final position across decades.

The percentage of instances occupying an initial position is higher than was previously assumed by Diessel (2001), but it has not changed much over the decades. There are some fluctuations between particular decades in the case of every subordinator. In the case of *in order that* and *lest*, these fluctuations seem to be larger than in the case of *in order to* and *so as to*, but no spectacular time-related trends are observable.

7.1.3 Data and Methodology II

Even though the patterns of input described in the Section 7.1.1 have probably enabled us to capture the majority of the instances of subordinators in initial position, one could speculate whether the results would change much if also the cases with one word in front of e.g. *in order to*, such as (57) – (59), were added to the results presented in Tables 7-2 – 7-5. In such cases the subordinator is not the very initial item of a sentence, nevertheless, it still is located at a preposed position with relation to the matrix clause. Even though the presence of a word such as *but*, *now* and *and* serves to emphasise the logical link between the sentence in question and the preceding sentence, the function exerted by the subordinators in initial position, namely "[to] assume a thematic role in the ongoing discourse" (Schmidtke-Bode 2009: 126) is, without doubt, still there.

To check what the results will look like if we also include cases such as (57) – (59), additional searches involving a wildcard (*) between the punctuation sign and the subordinator in question are conducted in COHA. The search patterns for e.g. *in order to* are following ". * in order to", "? * in order to", "! * in order to". The results obtained for these combinations are added to the figures we had for the patterns without the wildcard (*) (Tables 7-2 – 7-5) .

(57) *But <u>in order to</u> be useful to the world, I see not why a man must necessarily exercise a profession or hold an office*. (COHA: 1828; MAG: "The Art of Being Happy")

(58) *Now <u>in order to</u> safeguard such people as B, curious to the point of recklessness, the law will have to require all airship operators to have a license, and to secure this license airship pilots will have to meet certain requirements*. (COHA: 1910; NF: "Flying Machines: construction and operation; a practical book which shows, in illustrations, working")

(59) *And <u>in order to</u> give a fair characterization of his argument one should not portray him as an inductivist, however natural such a portrayal may seem, as it is the case in the above reconstruction*. (COHA: 1973; NF: "History of Science as Explanation")

7.1.4 Results and Discussion II

Table 7-6 presents the percentages of subordinators used in initial position, after adding the values for the variants with one word in front to the results in Tables 7-2 – 7-5.

As we can see, the percentage of preposed uses grew in the case of every variant. The highest growth is noted by *lest*, which e.g. in the decade 1990 has been used as the first or second word in a sentence in almost 21% of all its uses. Also the values for *in order to* and *in order that* are visibly higher after we add the results of the new searches.

However, the visual inspection of the results in Table 7-6 and of the line plots representing the time-related developments of the values – in Fig. 7-2 – does not reveal any distinct trends that could be generalised for the whole investigated network, even though the values for *so as to* and *lest* do show an intermediate positive correlation with time, which is statistically significant (with p-value being equal to 0.0007182 and 0.0001422 respectively).

Decade	***in order to*** **initial position** (percentages)	***so as to*** **initial position** (percentages)	***in order that*** **initial position** (percentages)	***lest*** **initial position** (percentages)
1810	15.74%	0%	0%	8.62%
1820	11.85%	0.37%	6.25%	3.75%
1830	12.50%	0.88%	10.22%	5.66%
1840	12.83%	0.60%	14.50%	6.57%
1850	12.40%	0.33%	9.68%	3.50%
1860	10.98%	0.25%	12.04%	6.34%
1870	10.56%	0.53%	9.14%	4.67%
1880	10.85%	0.76%	16.02%	5.34%
1890	12.50%	0.64%	8.48%	5.71%
1900	14.09%	0.97%	14.98%	3.77%
1910	16.52%	1.15%	11.55%	5.77%
1920	14.89%	1.15%	11.19%	9.07%
1930	15.26%	1.02%	10.70%	6.67%
1940	12.73%	1.61%	17.14%	8.93%
1950	14.45%	1.48%	9.92%	9.74%
1960	12.59%	1.15%	10.39%	7.94%

1970	13.05%	1.54%	13.46%	12.68%
1980	11.58%	1.83%	24.14%	10.43%
1990	12.47%	1.20%	0%	20.75%
2000	11.15%	0%	15.00%	13.68%

Table 7-6: Percentage of subordinators in initial position across time – values for one word in front of a subordinators added to the values from Tables 7.2 – 7.5.

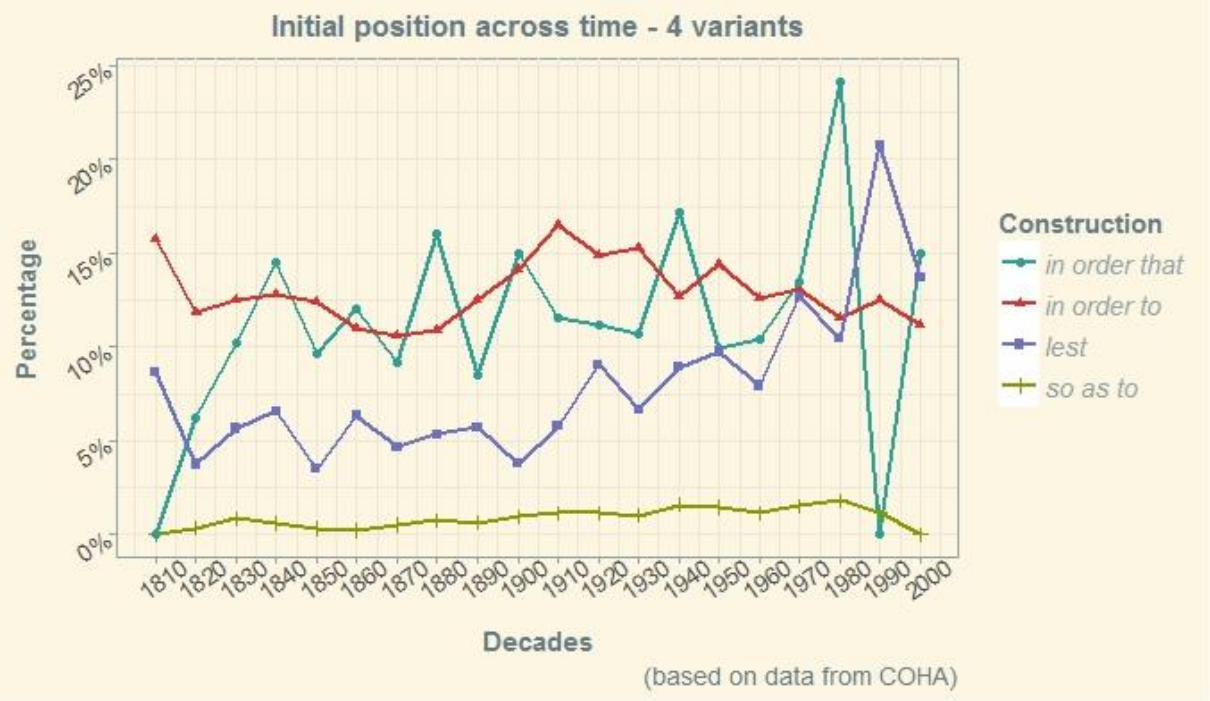


Fig. 7-2: Initial position across time for *in order that*, *in order to*, *lest* and *so as to*.

7.1.5 Initial vs. final position across genres – in order to *and* in order that

The distribution of preposed variants of subordinators across different genres is, however, also something potentially interesting in the light of findings from Section 6.2, which was focused on distributional fragmentation. Since subordinators in initial position might be viewed as having a different function than subordinators in the final position (see Section 7.1), chances are that as the frequency numbers decrease over time, one of the functions might become more pronounced. A situation in which there are more initially-positioned subordinators in some genres than in other could mean that for a given genre the global function is more important than the local one. Since we know that the number of instances of subordinators in question decreases across time (see e.g. Fig. 4-2), and the

remaining instances seem to show a certain degree of distributional fragmentation (see e.g. Section 6.2.2), a situation in which the proportion of preposed and postposed subordinators would be different with regard to different genres seems perfectly imaginable.

In order to check if this might be the case, two subordinators are taken, namely the ones with the highest number of instances in initial position – *in order to* and *in order that*. For every one of them the percentage of instances in initial and final position in each of the COHA genres (*fiction*, *magazine*, *newspaper* and *non-fiction*) and in each of the decades in the time period of 1860-2009 is extracted from the corpus, and turned into percentages. The results for the initial position are then visualised with an aim of looking for trends concerning an interplay of genre and time. Figure 7-3 presents the percentages of the initial uses of *in order to* across time and genre. The figures used for the upper plot were calculated with the use of methodology described in Section 7.1.1, namely the subordinator is the very first word in a sentence, whereas the lower plot contains additionally the results of searches done with the use of a wildcard between the punctuation sign and subordinator (Section 7.1.3). Figure 7-4 presents the analogical values for *in order that*.

While there clearly are many relatively large fluctuations between particular decades in the case of both *in order to* and *in order that*, for both of them the genre of *non-fiction* seems to be the one with the highest percentage of subordinators in the initial position. For *in order to* there is a relatively stable and marked trend of increase in the proportion of instances occupying the initial position from 1870 to 1950. Since 1970 a downward tendency becomes visible, however, *non-fiction* continues to be the genre with the highest proportion of initial vs. final usages of *in order to*. Out of the four genres, *fiction* appears to have the lowest number of preposed uses of *in order to*.

In the case of *in order that*, the fluctuations, probably resulting from a much lower overall number of instances than in the case of *in order to*, are much more visible. The proportions of instances of *in order that* in the initial position seem to be more even than for *in order to*. The genre of *non-fiction* appears to have more ups than any other genre, especially the values for 1980 are extremely high, but to say that it definitely dominates the picture would be an exaggeration.

The use of slightly different methodological approaches does not influence the results with regard to any tendencies visible in the two sets of plots. Both the upper and the lower plot in Figs. 7-3 and 7-4 show very similar tendencies, moreover, in the case of *in order to*, in the lower plot the lines for *non-fiction* and *magazine* seem to be smoother. This, however, is not visible for any of the lines in Fig. 7-4. To sum up, the difference between

the upper and the lower plot is, for both of the constructions, visible above all with regard to the overall percentage of the instances in initial position, which, in the case of the two lower plots (additional searches with the use of wildcard) is higher.

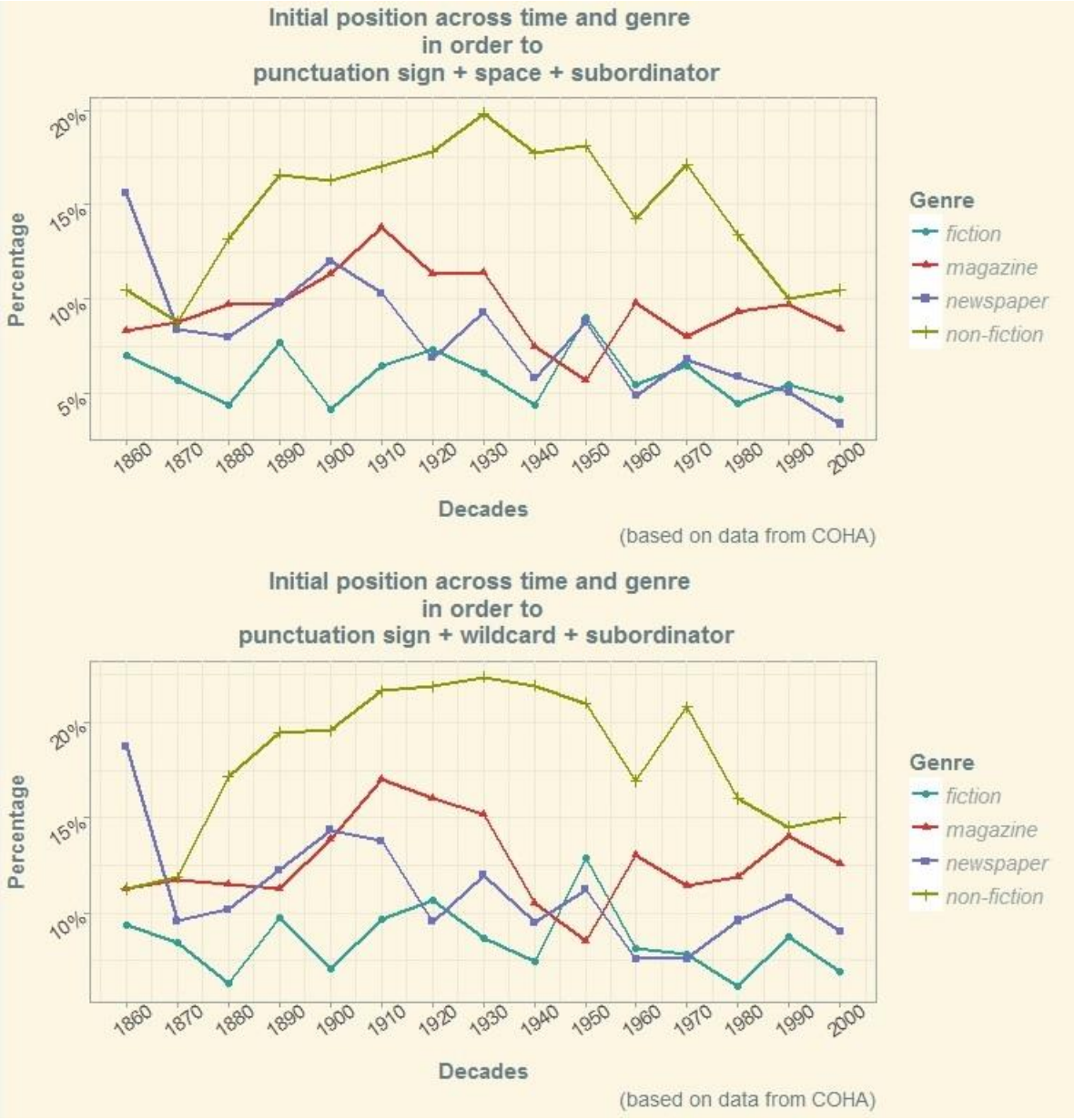


Fig. 7-3: *In order to* in initial position – percentages per genres and decades.

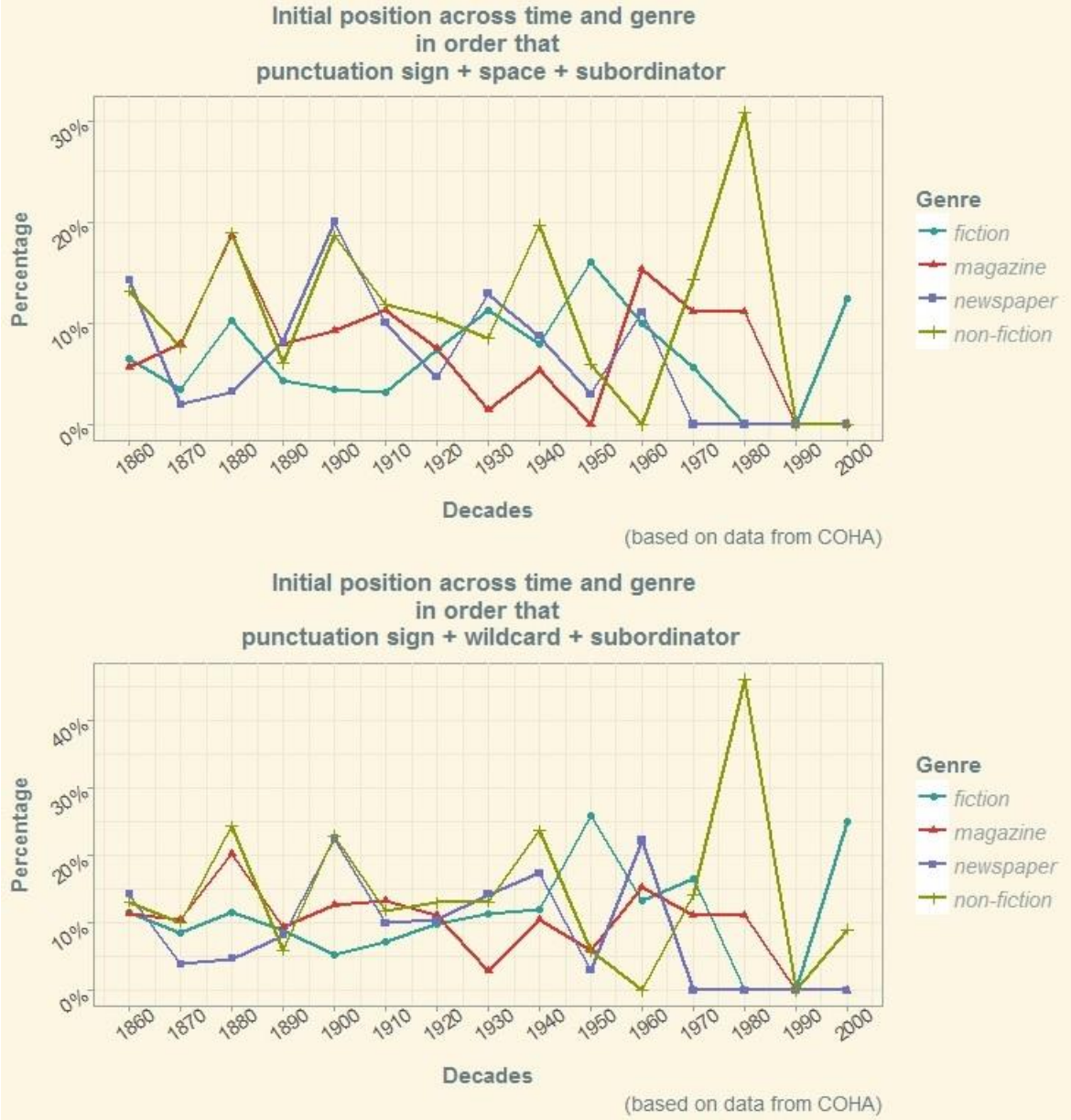


Fig. 7-4: *In order that* in initial position – percentages per genres and decades.

7.1.6 Conclusions

No diachronic trends of either a decrease or an increase regarding the position taken by the investigated purpose subordinators have been detected. The fluctuations on a decade-to-decade basis are stronger in the case of the subordinators which note a higher degree of decrease in the frequency of use across time, such as *in order that* and *so as to*, than in the case of *in order to*, see Tables 7-2 – 7-6 and Fig. 7-3.

Also with regard to genres, no clear trends that could possibly point to any diachronic changes in the distribution have been observed. Nevertheless, it is worth noting that in the case of *in order to* the genre of *non-fiction* seems to dominate the picture – most

of the instances of initial uses of *in order to* are concentrated in this genre, which might, very likely, result from the fact that the global function which the preposed purpose clauses are assumed to have (e.g. Thompson 1985; Ford 1993; Schmidtke-Bode 2009) seems, by its nature, very typical for texts classified as non-fiction, academic or scientific.

7.2 The negative variants of subordinators of purpose

Each of the purpose subordinators this work looks at, except for *lest*, can be used to convey both the positive, such as in (60), or the negative meaning, as exemplified by (61) and (62).

(60) *Mr. Harnden sat down in order to express his emotions; Mrs. Harnden stood up.* (COHA: 1921; FIC: "When Egypt Went Broke")

(61) *He moved toward it very carefully, in order not to obliterate any footprints.* (COHA: 1921; FIC: "Steve and the Steam Engine")

(62) *These foods must be selected carefully, in order that they will not upset the digestive system of the baby.* (COHA: 1934; NF: "Your Home and Family")

The aim of the present section is to look at the distributions of the default and negative variants of *in order to*, *so as to* and *in order that* across time. A situation in which the negative variant(s) would show a decrease in the proportion of the instances they used to take in the past could point to the presence of paradigmatic atrophy.

7.2.1 Data and Methodology

As was the case in Section 7.1.1, we are interested in the proportion of the whole number of the instances of a given construction that the negative variants take. In order to calculate the percentages for each decade in the time period of 1810-2009, corpus searches in the online version of COHA are conducted. When it comes to *in order to* there are two searches done, namely for *in order to* and for *in order not to*. Analogically, two searches are conducted for the second non-finite variant – *so as to* and *so as not to*. The results of these two searches are then added and the proportion taken by each variant is calculated.

For *in order that* four searches are done – for the default variant – *in order that* – to estimate the total number of the instances, and for the patterns "in order that * * not", "in order that * * * not" and "in order that * * * * not". It is hoped that this approach, while maximising the precision and recall, keeps the searches within a manageable size[44]. The stars (*) situated between *in order that* and *not* represent wildcards, which in the search results are replaced with words, the number of which depends on the number of wildcards. The results of the three searches are then added to each other and subtracted from the total number of the instances of *in order that* to obtain the number of the positive variant. The last step is the calculation of the proportion of *in order that* and *in order that … not*. See (63) – (65) for examples of each the three search patterns for the negative variants of *in order that*.

(63) *The questions are made very general, in order that they may not be too much depended upon*. (COHA: 1830; NF: "Lectures on school-keeping")

(64) *Lanny knew that Marcel spoke with authority -- this lover who had had to leave his love and go to war; this worshiper of beauty who now had to speak through a veil in order that his friends might not see his ugliness*. (COHA: 1940; FIC: "World's End")

(65) *Kate at once engaged him in conversation in order that he and Morton might not fall into argument, and with the further purpose of permitting her young people a little time for mutual explanation*. (COHA: 1905; FIC: "The Tyranny of the Dark")

7.2.2 Results and Discussion

Table 7-7 sums up the results in the form of percentages of the negative variants of *in order to, so as to* and in *order that*. Figure 7-5 visualises the results in the form of three line plots.

[44] The lexical searches for *not* are considered sufficient, no searches were conducted for *n't* contractions, as COHA features texts representing written language.

Decade	Percentage of the whole taken by a given variant		
	in order not to	***so as not to***	***in order that … not***
1810	0%	18.18%	8.33%
1820	0.78%	2.91%	8.75%
1830	4.48%	3.65%	7.56%
1840	0.29%	5.21%	4.96%
1850	1.03%	4.89%	4.84%
1860	11.92%	6.43%	5.69%
1870	10.06%	5.95%	5.90%
1880	0.89%	7.4%	5.34%
1890	1.07%	6.38%	4.39%
1900	16.8%	7.12%	6.04%
1910	1.38%	10.09%	4.39%
1920	2.05%	8.7%	5.02%
1930	14.46%	12.92%	6.35%
1940	1.42%	17.48%	5.24%
1950	2.07%	29.69%	3.82%
1960	1.19%	19.95%	10.39%
1970	1.15%	29.43%	3.85%
1980	1.07%	31.23%	3.45%
1990	1.41%	44.48%	0%
2000	0.71%	43.48%	5.00%

Table 7-7: Percentage of the negative variants of *in order to*, *so as to* and *in order that* across time.

Clear trends emerge neither for *in order not to* nor for *in order that … not*. The figures show some fluctuations and oscillate between 0 and 14.5%. Still, no significant correlation between time and the percentage of the negative variants is present.

The situation is different in the case of *so as not to*, the frequency of which increases from approximately 1930 onwards. The highest percentage of *so as not to* in relation to *so as to* is close to 45% (for the decade 1990). A highly significant (p-value = 1.035e-07) positive correlation (tau = 0.768) between time and the percentage of the negative variant of *so as to* has been detected. A development of this kind might suggest *so as not to* is

taking over some of the functions previously expressed by *lest*, however, the frequency figures from Table 5-13, visualised in Figure 5-14, show there is no obvious reflection of the decrease in the frequency displayed by *lest* and the increase of *so as not to*.

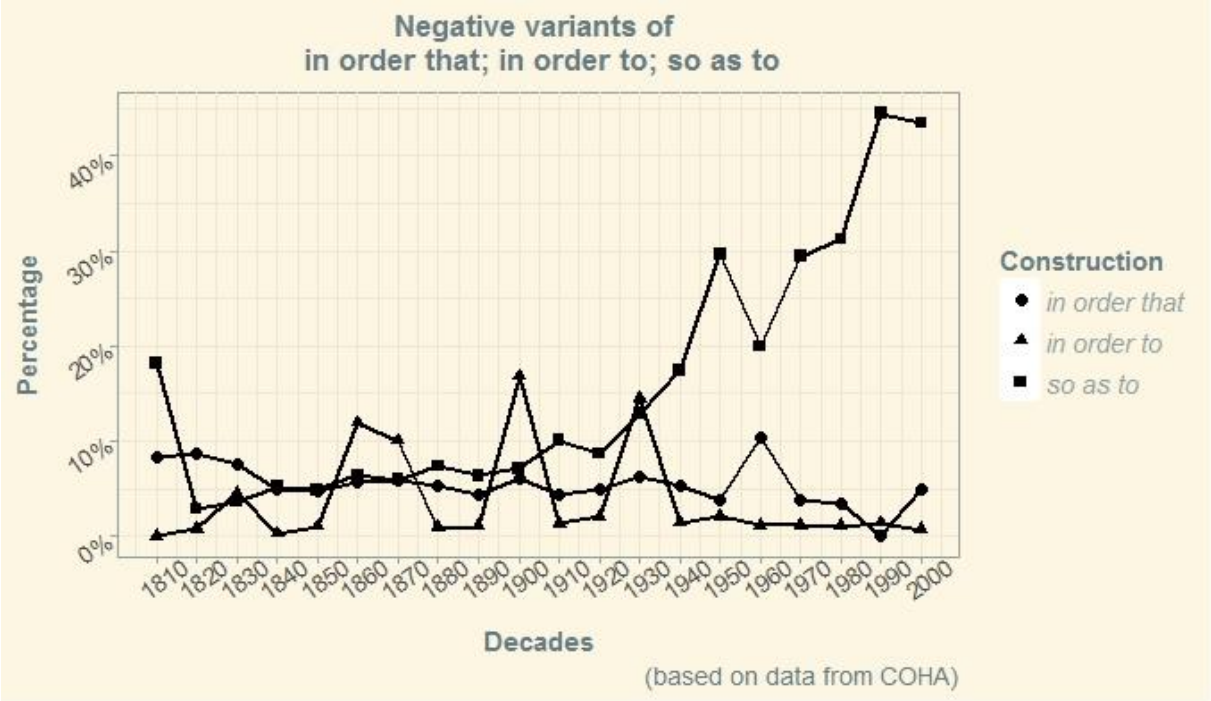


Fig. 7-5: Negative variants of *in order that*, *in order to* and *so as to*.

7.2.3 Conclusions

Can any of the developments concerning the negative variants of *in order to*, *so as to* and *in order that* be viewed as an instantiation of paradigmatic atrophy? Since the figures for *in order to* and *in order that* seem more or less stable across the whole period, the answer is negative. When it comes to *so as to*, there clearly is some kind of change underway – it might be that the originally non-default negative variant is simply becoming more important. However, since this development happens along with the overall decrease in the frequency of use (see Figure 4-2), it could be classified as an instantiation of paradigmatic atrophy. It will definitely be very interesting to see how the situation develops in the future.

7.3 Summary

The present chapter was focused on signs of paradigmatic atrophy with regard to two properties of purpose subordinators, namely the different functional scopes of the

subordinators in the initial and in the final position (see Section 7.1) and the frequency of negative variants, such as *in order not to* or *so as not to* (see Section 7.2). With regard to neither of these two properties have signs of paradigmatic atrophy been detected. The study looking at the distributions of the initial uses of *in order to* and *in order that* did neither reveal any clear tendencies towards the dominance of one genre over the other genres, even though the genre of *non-fiction* has, for a long time, been the genre with the highest percentage of the initial uses of *in order to* (see Section 7.1.5).

8. Higher-order processes

Wenn der Himmel einfällt, bleibt nirgends ein Stuhl stehen[45]

The focus of the present chapter lies on so-called higher-order processes, which are understood as changes happening above the constructional level. Such changes concern a "higher level of grammatical organization than the construction" (Hilpert 2013: 14). One example of such changes is, according to Hilpert (2013:14), deflexion (Norde 2001), understood as a general loss of inflectional morphological categories. Another example is the breakdown of the bounded system of Old English, which according to Petré (2010) was instrumental in the disappearance of *weorð* (see Section 1.3).

Higher-order changes, phenomena or processes are also sometimes referred to as system dependency or system-dependent changes. The effects of higher-order processes are, naturally, visible on the constructional level. However, in order to prove that a higher-order process is potentially causing the changes observed on the constructional level, one has to go beyond the constructional level and look for larger trends happening in the language.

The present chapter aims at pointing to links between some of the higher-order processes and the changes happening in the network of English purpose subordinators. The chapter draws from the findings presented in the previous chapters of this dissertation and goes up from the constructional to supra-constructional levels.

Section 8.1 presents the decrease in word length of an English sentence as a process which might influence syntactic usage. Attention is also given to parallel and associated trends such as change in the English punctuation system and changes in the scope of functions fulfilled by the written language which happened along with the advent of mass readership and mass-circulation newspapers. Section 8.2 looks at the rise of a *to*-infinitive, a process described by Los (2009), which might be related to many "smaller" trends such as the growing popularity and frequency of use of infinitival clauses with notional subjects

[45] A German proverb, translation into English: *When the sky falls down, there shall not be a single chair left standing*.

introduced by *for* (Mair & Leech 2006: 336; De Smet 2013: 79), a tendency which has also been addressed in Section 5.3.3 of the present work. Section 8.3 summarises the findings.

8.1 Decrease in the sentence length and changes in the syntactic usage

An impulse towards seeing the sentence length as a factor which could be associated with the decrease in the frequency of some of the purpose subordinators was provided by the study of the purposive *to*-infinitive as a potential competitor of *in order to* and *so as to*, described in Section 5.2. One of the goals of that study was to estimate the size of the share of purposive uses of a *to*-infinitive in comparison to other uses and to detect any changes with regard to this share across time. To achieve this goal over 6000 randomly chosen instances of a *to*-infinitive were analysed qualitatively and classified as purposive or non-purposive. During this process the syntactic surrounding of each *to*-infinitive in the sample had to be examined and it was at this point that an interesting observation has been made – sentences in earlier decades seem to be much longer than in the more recent ones.

To check if this observation, which could also be treated as a hypothesis, is true, a short pilot study was conducted. All the sentences classified as containing a purposive *to*-infinitive were extracted from the data sets and their length was calculated. Note that sentence length is defined here as the number of words which come between the first capitalised word of a sentence and the final punctuation mark, namely full stop, question or exclamation mark. In this small pilot study we evaluated the length of 534 sentences (this is the number of sentences containing purposive *to*-infinitives we had, see Section 5.2.3). Table 8-1 contains the results in the form of mean values (in words) for each decade in the time period 1810-2009. Figure 8-1 presents a scatter plot with a regression line showing the overall trend concerning the sentence length in our data set.

Decade	**Mean sentence length**
1810	44.20
1820	37.93
1830	35.50
1840	29.38
1850	35.54
1860	28.13

1870	29.44
1880	27.67
1890	32.83
1900	27.23
1910	33.73
1920	32.32
1930	26.27
1940	32.14
1950	27.86
1960	23.10
1970	27.71
1980	24.06
1990	20.95
2000	22.05

Table 8-1: Mean sentence length (in words) in the sample of 534 sentences containing purposive *to*-infinitives (for details on the sample see Section 5.3.2).

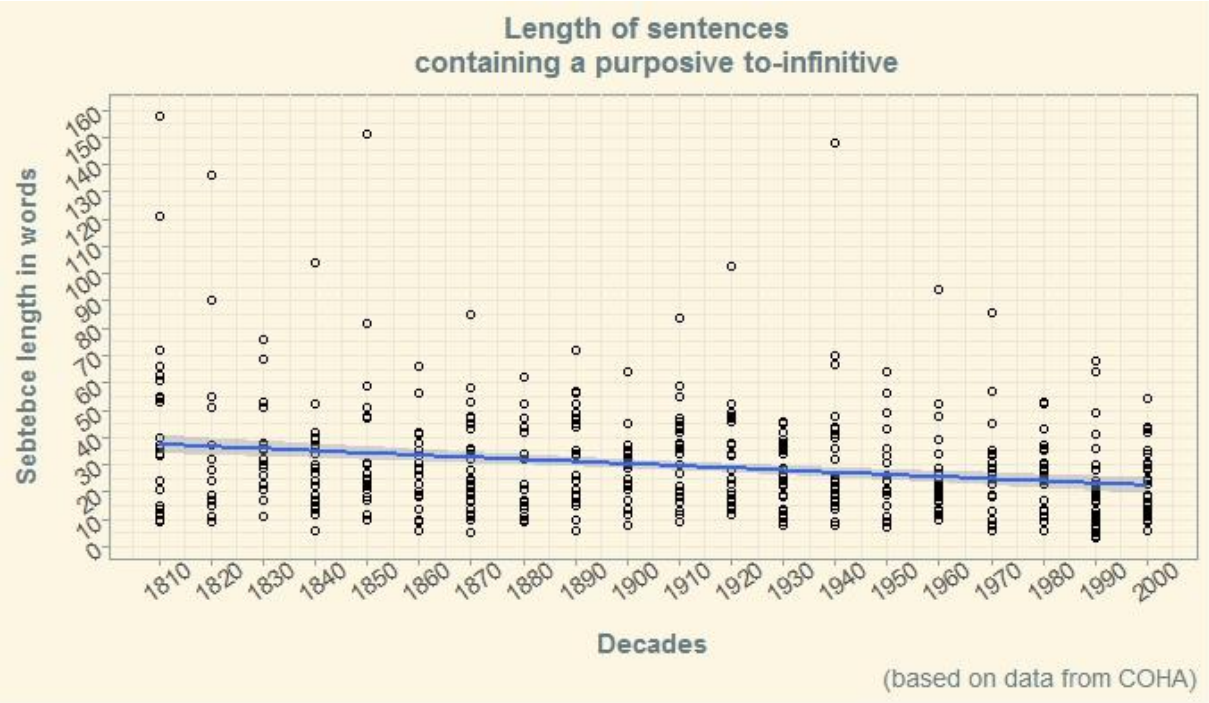


Fig. 8-1: Sentence length across time – sentences containing purposive *to*-infinitives.

As we can see, the results of the pilot study support the hypothesis that there seem to be a downward trend with regard to sentence length, at least in the data set containing sentences with purposive *to*-infinitives, the source of which is COHA. Between the decades of 1810 and 2000, the mean sentence length of sentences containing a purposive *to*-infinitive decreased by approximately 22.15 words.

Correlation testing (Kendall's tau test, see Section 4.4.3) conducted for this dataset yields a statistically significant (p-value = 2.507e-05) result pointing in the direction of a high negative correlation between time and the mean sentence length (tau = -0.6421).

Is this observed tendency a general trend happening across different genres? When did it actually start and what are the possible causes of it? Can it be possibly linked to the frequency developments observed in the network of certain English purpose subordinators (see e.g. Section 4.2.2)? The present section aims at answering these three questions.

8.1.1 Sentence length across time and genre – literature

The trend in which the English sentence becomes shorter is noticed around the end of nineteenth century by Lewis (1894: 34), who, in his work investigating the structure of the paragraph in written English across centuries, states "the English sentence has decreased in average length at least one-half in three hundred years". He supports this opinion by presenting calculations according to which the paragraph in 16th century has the same length as the paragraph in 19th century, but in terms of sentences, the paragraph in the 19th century contains twice as many sentences. The trend is also addressed by Biber & Conrad (2009: 152), who note "a very steady progression from the extremely long sentences of Defoe to the short sentences of Vonnegut and Bellow".

Focusing on newspaper language, Westin (2002) observes a process of decrease in sentence length in a few different English newspapers among which there are *The Times*, *The Guardian* and *The Daily Telegraph*. The time period of her study is 1900-2000. Similarly, focusing on newspaper language, Schneider (2002: 98) shows that sentence length in the genre of news has decreased by an average of 15 words since 1700, while Fries (2010) notes a decrease of approximately 10 words during the 18th century on the basis of investigation of texts from the *London Gazette*.

The trend of decrease in sentence length seems to be also present in the academic language, as Gross, Harmon and Reidy (2002: 171) detect a "a definite shrinking in average sentence length over time" in scientific prose. Moreover, their work suggests that the

observed tendency might be generalisable to other languages, as they show analogous developments in scientific texts written in not only English, but also German and French.

My large study, Rudnicka (2018), looks at sentence length across time and different genres, as represented by COHA. The studied time period is 1810-2009 and the genres which are looked at include *fiction*, *magazine*, *newspaper*, *non-fiction* and a subsection of *fiction*, *movie&play script*, which is treated as a proxy for the spoken language. In total, the length of more than nineteen million sentences is calculated. The study features the use of full-text offline version of COHA. Table 8-2 presents a sum-up of results.

Decade	***Magazine***	***Newspaper***	***Non-fiction***	***Fiction***	***Movie&play script***
1810	27.29	NA	27.96	11.12	NA
1820	27.77	NA	24.23	17.64	NA
1830	27.76	NA	24.06	18.51	NA
1840	27	NA	23.41	17.85	NA
1850	25.84	NA	23.58	17.69	NA
1860	26.02	21.57	22.77	15.93	NA
1870	25.44	22.13	21.52	15.47	NA
1880	24.96	21.39	20.5	15.9	NA
1890	25.02	19.9	20.9	15.9	NA
1900	22.65	17.83	21.97	14.58	16.86
1910	20.9	18.89	21.1	13.54	11.66
1920	18.34	18.14	21.25	13.2	12.46
1930	18.53	19.96	20.74	12.69	10.1
1940	17.54	20.2	20.56	12.37	9.49
1950	17.57	19.04	20.36	12.36	9.84
1960	17.72	18.2	20.53	12.09	9.12
1970	17.87	18.72	20.45	11.76	9.77
1980	17.65	18.77	19.65	11.73	8.63
1990	17.78	16.72	20.8	11.8	8.62
2000	17.14	16.7	19.94	12.07	NA

Table 8-2: Mean sentence lengths in words in COHA across time and genres (taken from Rudnicka, 2018: 233, Table 2).

If we treat the mean sentence lengths presented in Table 8-2 as representative, it becomes evident that sentence length does decrease with time and that this decrease happens in all genres, although the genres differ with regard to the rate of the observed decrease, as well as the initial and final sentence lengths. At the beginning of the nineteenth century the two genres with longest sentences belonged to *magazine* and *non-fiction*. By the end of the twentieth century the sentences in *magazine* became approximately 10.15 words shorter, while in the *non-fiction* genre the decrease amounted to approximately 8 words. The sentences in the genre of *newspaper*, which has only been added to COHA in 1860, are shown to be almost 5 words shorter in the end of the studied period. Surprisingly, also the proxy for the spoken language, namely the *movie&play script* subgenre is shown to have decreased in sentence length, the decrease being higher than in the case of *newspaper*, and amounting to a little over 8 words. As of the decade of 2000, *movie&play script* is the genre with shortest sentences. When it comes to *fiction*, the earliest data for this genre seem to be heavily biased and polluted by two-word sentences, which makes it impossible to treat them as representative (Rudnicka, 2018: 233). However, this is no longer the case for 1830 or 1840, and if we take e.g. 1840 as the starting decade, over the next sixteen decades we can see a decrease amounting to a little less than 6 words. The results show that as of the decade of 2000, *non-fiction* is still the genre with the longest sentences (mean sentence length 19.94 words), followed by *magazine* (mean sentence length 17.14) and *newspaper* (mean sentence length 16.7). The genre with shortest sentences of all is *movie&play script*, with mean sentence length amounting to 8.62 in the 1990 decade.

Given the number and relative variety of works noting some form of a decrease of sentence length across time, it seems fair to assume that indeed some change with regard to this property of language has been taking place over the last few centuries. When did this trend start? According to the observations made by Lewis (1894) an English paragraph of the 19th century contained twice as many sentences as a paragraph in 16th century, while its word length stayed approximately the same, thus we might assume that the tendency in question might have already been present between these two points in time. However, it does seem probable that the decrease had not yet started before the beginning of the 16th century as Säily, Vartiainen and Siirtola (2017), who investigate the usefulness of part-of-speech annotation as a tool for the study of genre evolution and sociolinguistic variation across the time period represented by the *Parsed Corpus of Early English Correspondence*

(c.1410–1681), do not detect any changes with regard to sentence length across the period studied.

8.1.2 The causes of decrease in sentence length

Some of the researchers who note a change of sentence length across time attribute this development to the change in punctuation conventions. Biber & Conrad (2009: 153) claim that the change they observe results from the fact that earlier historical periods were characterised by a much more extensive use of colons and semicolons which used to function as structural equivalents of the full stop, a view which is supported by e.g. Miller (1908: 327). A possible solution to this problem could be to treat the semicolons and colons as sentence delimiters and to check whether the results would be different. This approach is taken by Westin (2002: 79), who claims that even after including semicolons and colons to the set of sentence delimiters, the pattern of development was almost identical to the one shown when she only used full stops, exclamation marks and question marks (1997: 16-17; quoted in Westin 2002: 79). However, since Westin does her research on relatively modern texts (time period 1900-2000), a question arises if the results would be different if she had older texts in her sample.

A look into COHA reveals that the frequency of use of semicolons displays a very marked decrease during the whole period represented by the corpus. On the other hand, the frequency of colons does not decrease, but, on the contrary, shows a slight increase over the years. Table 8-3 presents the results for both the colon and the semicolon, while Figure 8-2 features two line plots representing their frequency of use across the time period 1810-2009. Quantitatively (Kendall's tau test), there is a statistically significant (p-value < 2.2e-16) very high (tau=-0.989) negative correlation between the frequency of use of semicolons and time. In the case of colons, the correlation is positive (tau=0.6315) and also significant (p-value= 3.622e-05). Still, as can clearly be seen in Fig. 8-2, the frequency figures in the past used to be ten times higher for semicolons than for colons, thus the slight increase in use of the colons does not provide any counterweight to the drastic decrease displayed by the semicolon.

Decade	**Frequency of semicolons per million words**	**Frequency of colons per million words**
1810	9855.19	2985.93
1820	10887.56	1243.94

1830	9466.2	1247.44
1840	9092.37	1184.11
1850	8961.34	1078.46
1860	7963.41	1549.29
1870	7521.23	1576.15
1880	6811.39	1671.15
1890	6322.75	1798.32
1900	4900.62	1455.81
1910	4387.06	1381.15
1920	3727.76	1879.26
1930	2841.41	1746.81
1940	2770.62	1931.17
1950	2475.1	2013.62
1960	2322.95	2030.18
1970	2285.77	2033.03
1980	1999.29	2073.28
1990	1904.48	2803.68
2000	1862.56	2935.8

Table 8-3: Frequency per million words of semicolons and colons in the time period 1810-2009.

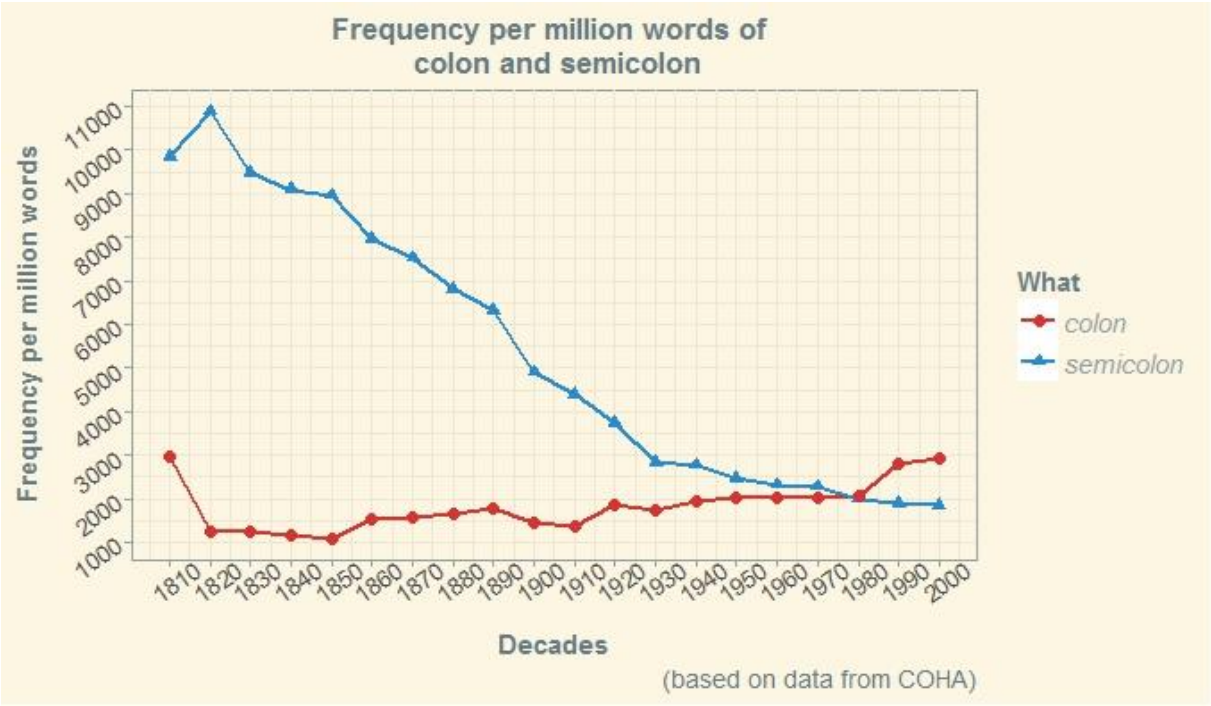


Fig. 8-2: Frequency per million words of colons and semicolons in COHA.

Since the decline of semicolon is a fact, the claim of some authors (Biber & Conrad 2009: 153; Fahnestock 2011: 265) that the decrease in sentence length does, at least to some extent, result from change in punctuation conventions might very well be true. However, one could also approach the problem from a different angle and ask why did the punctuation practices change in the first place. If the semicolon had managed to establish itself among sentence delimiter in the past, what factors led to its decline?

The answer to these questions might lie in the explanations for the decrease in sentence length offered by the authors of studies mentioned in the first few paragraphs of the previous section (8.1.1). Schneider (2002: 98ff.) claims that one of the most important factors that led to the change in sentence length was the need for greater comprehensibility for a mass readership. Westin (2002: 161) hypothesizes that the language of some of the newspapers might have been adjusted on purpose to attract broader audiences and to win in the competition for the potential readers, which could suggest that shorter sentences tend to be perceived as less complex and faster to read. Since sentence length is often treated as one of the factors influencing text comprehension (Fahnestock 2011: 169-170) and due to this fact it is included in many of the readability formulas such as e.g. Lexile reading measure, the explanations offered by Schneider and Westin do seem to make a lot of sense. Along similar lines, and by referring to the decrease in the frequency of use of semicolons, Rudnicka (2018: 225) notes that:

> [T]he dramatic decrease in the frequency of use of semicolons coincides with the achievement of mass literacy by the American society and the invention of new printing technologies since these developments took place around the mid- to late nineteenth century, as observe e.g. Hames and Rae (1996: 227).

The decrease in sentence length might thus have many different causes among which there are: changes in punctuation conventions; the development of mass readership; the advent of mass circulation newspapers; the achievement of mass literacy by the society and the invention of new printing technologies. Along with these changes happening, one has to also mention two "discourse-pragmatic" language change processes, which clearly point to social influences in the language change (Leech et al. 2009: 239) and which are very likely at work as well. The first one is *informalisation* of the language of the media,

understood as "[i]nformality of style, which is a matter of the absence of distance between addresser and addressee", a trend described by Leech et al. (2009: 239) which is strongly associated with speech, but can also be observed in the written language. The second one is *colloquialisation* – a trend introduced by Mair (1998: 153) as a result of which the written language becomes increasingly similar to the spoken language and, at the same time, increasingly more tolerant to various degrees of informality.

Thus, the decrease in sentence length, which at the first sight might seem to be a "by-product" of change in punctuation practices (Fahnestock 2011: 265), might rather be a resultant of many different trends in language and in the society, which, in turn, might be resulting from and reflecting some significant historical events and social & cultural changes.

8.1.3 Decrease of sentence length and syntactic usage

If we accept the fact that, for whatever of the many possible reasons, the sentences in English become shorter, it seems natural that, at least to some extent, the contents of these shorter sentences differ from the contents of the longer sentences. In other words, if sentences are shorter, but still manage to stay meaningful and complete, it denotes that inside of them fewer words are used to convey the meaning that was previously conveyed with the use of more words. This would go in line with the trend showing a growing preference of language users towards shorter and less elaborate variants of the subordinators of purpose, such as the use of a purposive *to*-infinitive instead of *in order to* or *so* * + finite clause instead of *so that* + finite clause, which has been observed and addressed in Section 5.6.

The present work proposes that the decrease in the frequency of use of the English subordinators of purpose such as e.g. *in order to, in order that* & *so as to* is interrelated with the observed decrease of sentence length, which is shown to be taking place over the last centuries. Figure 8-3 presents the evolution of mean sentence length across the four genres and one subsection of COHA – *fiction, magazine*, *newspaper*, *non-fiction* and *movie&play script* (for the data see Table 8-2), while Figure 8-4 visualises the frequency developments of the four subordinators which are shown to decrease in the frequency of use in the studied period (for the data see Table 4-1).

Evidently, the frequency developments of the four investigated purpose subordinators and mean sentence lengths across four genres and one subgenre of COHA follow very similar patterns. For both the frequency per million words and the mean

sentence length, the decrease in values in question seems to have started before or around the beginning of the studied period, which is the start of the nineteenth century, but it visibly accelerates around the middle of it, namely towards the beginning of the twentieth century.

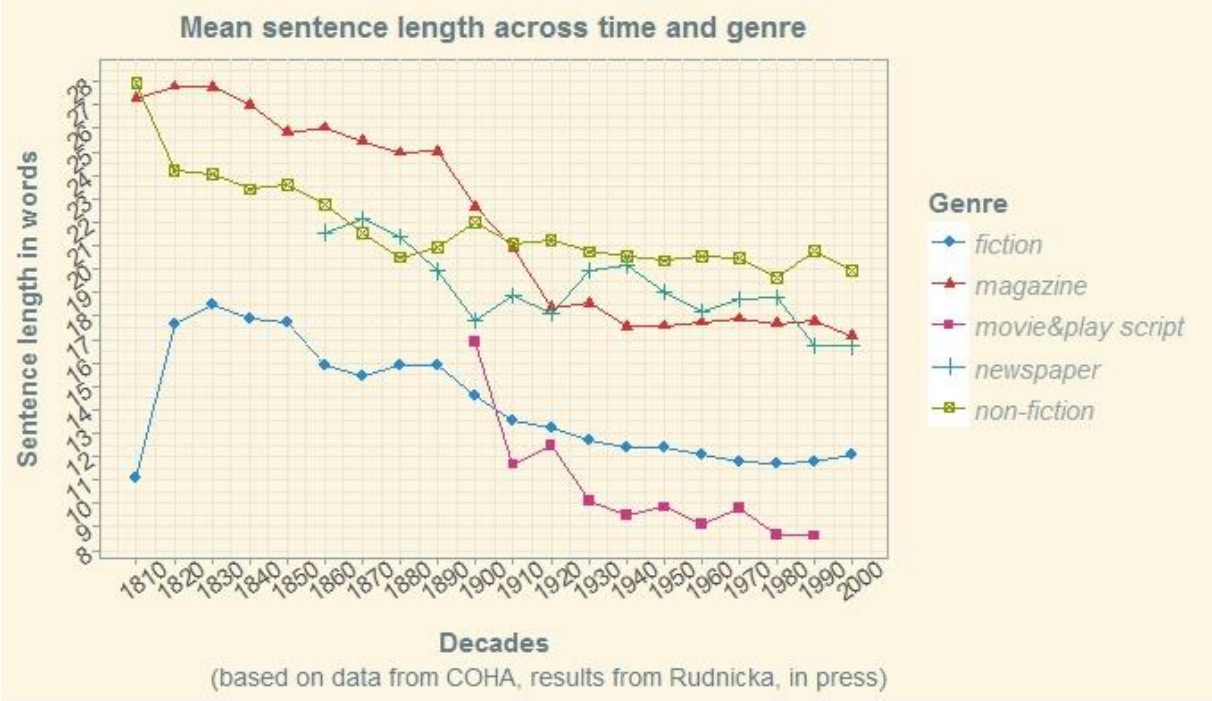


Fig. 8-3: Mean sentence length across genres in the time period 1810-2009.

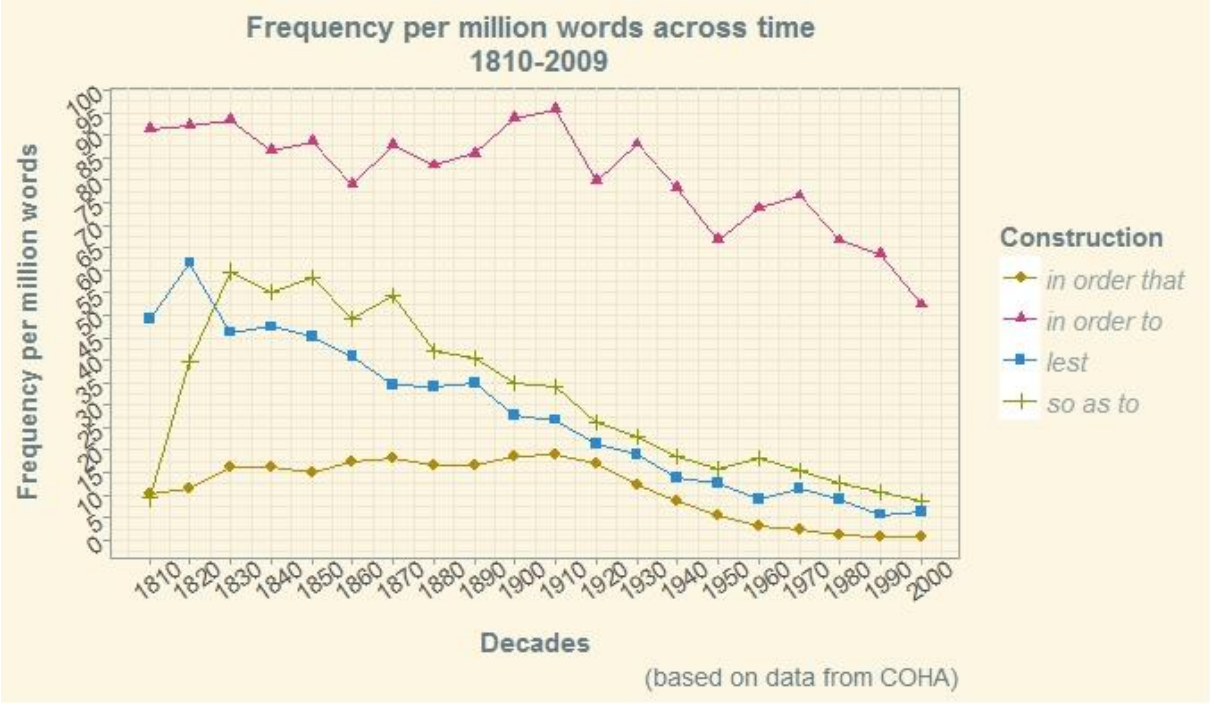


Fig. 8-4: Frequency per million words of *in order that*, *in order to*, *lest* and *so as to* across the time period 1810-2009.

A strong link between the purpose subordinators and changes in sentence length is provided by the origins of the subordinator *in order to* in the seventeenth century. As has already been mentioned (in Sections 3.2.1 and 5.2), according to Schmidtke-Bode (2009: 174) *in order* was added in front of the purposive *to*-infinitive as an answer to the need for purposive reinforcement after the use of the *to*-infinitive extended greatly during the late Old and Middle English periods. It is easy to imagine that the longer the sentence, the higher the chances that it will contain more than one *to*-infinitive. Furthermore, if there are two or more *to*-infinitives in different functions in the same sentence, the chances for confusion and the need for precision also grow – presumably this is why *in order to* first came into the linguistic existence. However, if we now imagine an opposite situation, namely sentences getting shorter and chances of seeing two *to*-infinitives used in different contexts close to each other getting lower, it seems evident that the need for precision is no longer there.

Another argument supporting the existence of a link between sentence length and the distribution of subordinators of purpose is provided by the findings with regard to genre-related distribution in Section 6.1.3. According to these findings, three out of four subordinators in question (*in order to, in order that* and *so as to*) show a preference towards the *non-fiction* (COHA) or the *academic* (COCA) genre. The fact that the *non-fiction* genre has been shown to have the longest sentences of all the COHA genres (see Fig. 8-2) might support the hypothesis that the shorter the sentence, the less need for precision (or an explicit, elaborate variant) there is. On the other hand, as Rudnicka (2018: 236) states, because of the natural function of providing disambiguation, the *non-fiction* genres still are likely to need the explicit variants with an aim of providing as much precision as possible. Due to this fact these genres might actually prove to be the most natural and intuitive environment for *in order to*. However, because of the stylistic value offered by the elaborate variants, a situation in which *in order to* changes its function from an every-day subordinator of purpose, which it used to be, to a more high-brow, elegant and formal variant does not seem to be very unlikely.

At this point we can also address the observations made in Section 6.3.2 of the present work, namely the fact that there are less Latin-based verbs among the collocates of *in order to* in the decade of 2000 than there were in 1830 and 1900. The two contradictory hypotheses were that i) "the observed decrease of *in order to* could have to do with the general decrease in popularity of the verbs of Latin origin" and ii) "the decrease in popularity of the Latin-based verbs might be related to the decrease in frequency of *in order*

to, which has always used to take these verbs as collocates". However, as the present section aims to show, both the decrease in popularity of the Latin-based verbs (which are often attributed a higher degree of formality) and the decrease in the frequency of *in order to* might not really be interrelated in a causal way but they rather share a few common causes, one of which might be e.g. discourse-pragmatic language change processes discussed in Section 8.1.2, such as colloqualisation (Mair 1998: 153) and informalisation (Leech et al. 2009: 239).

8.1.4 Conclusions: sentence length and syntactic usage

If, as has been argued, the language of the studied period has been influenced by the historical and social changes described in Section 8.1.2, such as the development of mass circulation newspapers and mass readership, or to say more generally – the gradual change in the function fulfilled by the written language – there is no reason to deny the possibility that these changes might have directly and indirectly influenced the syntactic usage as well. As Leech et al. (2009: 22) state on the existence of links between grammar and cultural changes:

> More often than not there are links between grammatical changes, on the one hand, and social and cultural changes, on the other. Such links may not be as obvious as the links between social change and lexical change, and they are certainly more indirect.

Thus, it is very probable that the social and cultural changes such as e.g. the achievement of mass literacy by the American society initiated or at least contributed to the "discourse-pragmatic" processes of informalisation (Leech et al. 2009: 239), and colloquialisation (Mair 1998: 153; Leech et al. 2009: 239), which are likely to be at work when it comes to both the decrease in sentence length and, in a more direct or indirect way, the decrease in the frequency of more elaborate variants of English purpose subordinators. Figure 8-5 presents a schema illustrating the developments discussed in the present section, along with particular levels of change, which all have an influence on the constructional level, here exemplified by the decrease in the frequency of use of *in order to*.

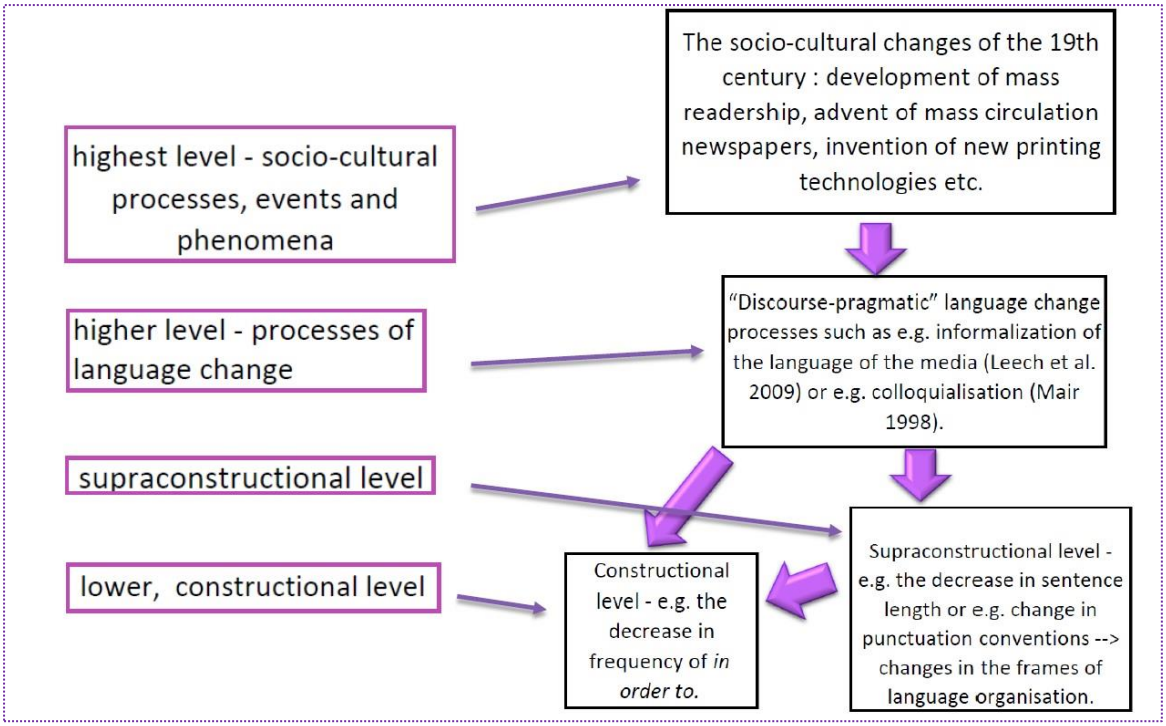


Figure 8-5: An externally-motivated higher-order process influencing the constructional level – a hierarchical schema.

However, since in the schema in Fig. 8-5 the socio-cultural changes of the 19th century constitute the highest level of changes, a question might arise about the time frames of the development which has been put in the centre of the present section, namely the general decrease in sentence length. As has been mentioned in the Section 8.1.1, the sentences are likely to have started to display a decrease in their length between the 16th and the 19th century. Why do we only refer to the 19th century changes as the time at which things started to change? An answer the this question is twofold, i) as has been shown in Section 8.1.3 and e.g. in the research of Rudnicka (2018), the decrease in sentence length started to visibly accelerate around the beginning of the 20th century, ii) it is assumed that the development of mass readership did not come out of nothing – the advent of mass circulation newspapers was an answer to the need in the society that has already been there.

In other words, the socio-cultural changes of the 19th century have very likely brought literacy to the tipping point and this is when the "discourse-pragmatic" language change processes (as illustrated on the second link of the chain in Fig. 8-5) initiated by the socio-cultural changes started to gain momentum.

In the terminology of Hickey (2012: 402) a change which appears to be "triggered and guided by social considerations" can be labelled as an *externally*-motivated change. By

analogy and with regard to higher-order phenomena, it is suggested here to differentiate between externally- and internally-motivated higher-order processes in language. Thus, the schema in Fig. 8-5 presents the different levels of change triggered by an externally-motivated higher-order process.

If, however, according to data presented in Table 8-2, the sentence length still shows some degree of an ongoing decrease around the end of the twentieth century, when does this process end? Is it still facilitated by the development of mass circulation newspapers or by some other developments? A look into a more recent corpus, namely the Corpus of Contemporary American English (COCA) could possibly help us find an answer to the first question. As has been mentioned in Section 2.4.2, COCA features more than 560 million words of text divided between five genres: *fiction*, *newspaper*, *popular magazine*, *academic journals* and *spoken*. The time period covered by COCA is 1990-2017. A study looking at sentence length of the texts featured in COCA would very likely provide us with an answer as for whether the decrease in sentence length is still ongoing or whether it seems to be losing momentum. The final part of the present section focuses on looking at sentence length in modern texts as represented by the contents of COCA.

8.1.5 COCA: Sentence length across genres

The present section briefly presents a study done on the full-text offline version of COCA, which features the texts from the time period of 1990-2012 and on the text sample of offline version of the 2016-2017 update of COCA. The programme of choice for the sentence tokenisation is Mathematica 10.4, which contains tools and packages designed for linguistic data[46], such as TextSentences – an "intelligent" tool used for sentence tokenisaton, the precision of which can be assessed as 93-98% (Rudnicka, 2018: 228) and which recognises the most popular abbreviations such as "Mr.", "Ms." or "Jr." as not constituting sentences of its own. After the sentences are tokenised, WordCount tool is used to count the number of words in each of the sentences.

In the present study, the data belonging to the COCA corpus are divided into three time subperiods, namely the first subperiod – 1990-1999, the second subperiod 2000-2009, and the third subperiod 2010-2012 + 2016-2017. The mean sentence lengths in each genre per each of the three subperiods are included in Table 8-4 and visualised in Fig. 8-6.

[46] http://reference.wolfram.com/language/guide/LinguisticData.html.

The mean sentence lengths across different COCA genres included in Table 8-4 can be assessed as very similar to the results for the last decades of COHA, see Table 8-2. Only the *spoken* genre seems to have longer sentences than the proxy for the spoken language of COHA, which is the *movie&play script* subsection. In the case of all other genres the counterparts seem to display very similar mean lengths. Of course this might also be influenced by the fact that in the most recent decades of COHA, among the contents there are many sources which are included in COCA as well[47].

	1990-1999		**2000-2009**		**2010-2012 (+ sample 2016/17)**	
Genre	Sample size (in sentences)	Mean sentence length	Sample size (in sentences)	Mean sentence length	Sample size (in sentences)	Mean sentence length
academic journals	1 432 603	21.86	1 456 374	21.34	473 721	17.98
spoken	2 586 587	13.71	2 648 924	13.18	835 492	12.07
magazine	1 950 520	17.68	2 007 688	17.2	534 555	16.81
newspaper	1 920 253	17.11	1 906 420	17	510 285	17.2
fiction	2 786 525	11.59	2 792 405	11.93	766 699	12.17

Table 8-4: Mean sentence lengths in the different genres of COCA.

[47] See webpage on the sources of COHA: https://corpus.byu.edu/coha/.

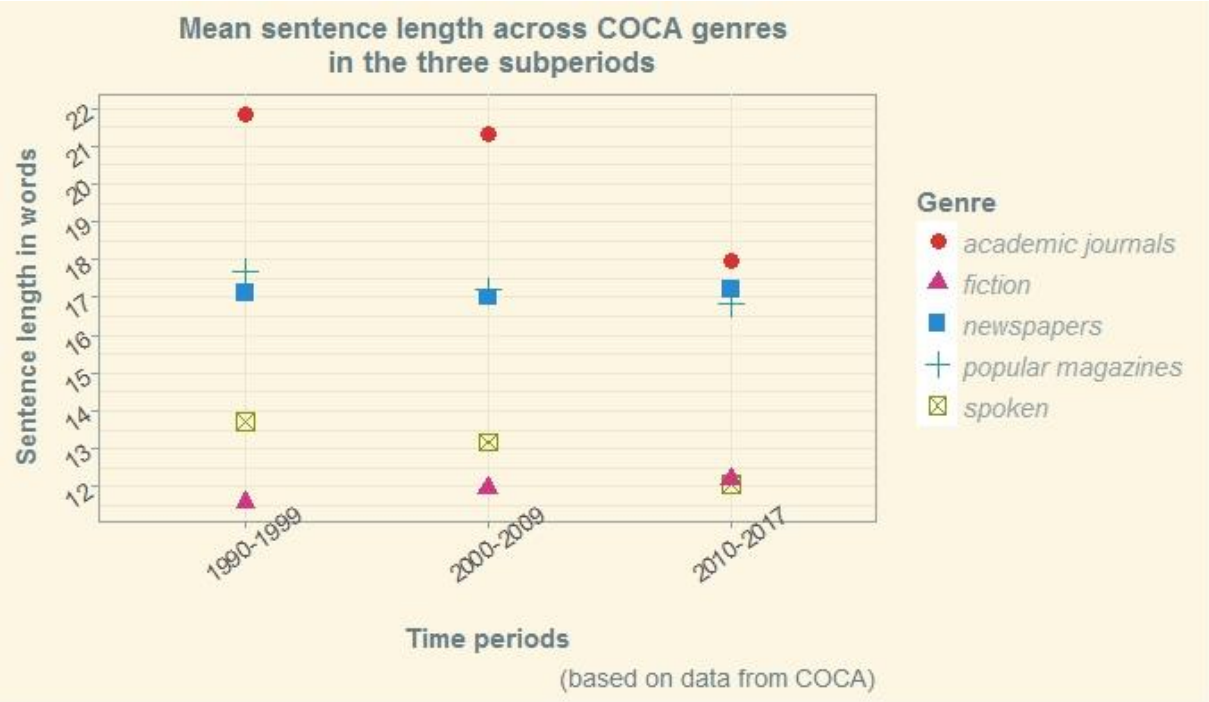


Fig. 8-6: Mean sentence length in COCA across the three subperiods.

However, there seems to be a slight decrease in the sentence length even across the three subperiods of COCA, as visualised in Fig. 8-5. This decrease is highest in the case of the *academic journals* genre. The mean sentence length drops by 3.88 words between the subperiod of 1990-1999 and 2010-2017. Also the *spoken* genre seems to display a slight decrease, namely of 1.64 words. The genre *popular magazines* seems to have a little bit shorter sentences – the decrease amounts to 0.87 words. No decrease is observed in the *newspaper* genre. The mean sentence length is shown to be relatively stable across the three subperiods. In the *fiction* genre there is an increase visualised, namely the sentences in the last subperiod are shown to be 0.58 words longer than in the first subperiod, a development which seems more of a slight fluctuation than a reliable sign of a trend opposite to the general decrease in sentence length visualised in Fig. 8-3.

On the basis of Table 8-4 and Fig. 8-6, one can say that the decrease in sentence length can still be visualised. The development goes in line with the developments presented in Table 8-2 and in Fig. 8-3. Still, a question might arise: if the developments of the nineteenth century, which were influencing the decrease in the sentence length as presented in Fig. 8-5, already happened, why is there still an ongoing decrease? In an attempt to answer to this question, one might speculate that the first decades of the twenty-

first century brought new developments and inventions, which are also likely to exert an influence pointing in, more or less, the same direction as the developments of the nineteenth century. One such development is the advent and spread of mobile media devices, such as smartphones and tablet computers. According to a survey by Pew Research Center[48] released in June 2017 "[m]ore than eight-in-ten U.S. adults now get news on a mobile device (85%), compared with 72% just a year ago and slightly more than half in 2013 (54%)".

In 2011 smartphone sales for the first time outpaced sales of the personal computers[49]. As the number of people getting news on their mobile devices increases, more and more magazines and newspapers, e.g. The Guardian[50] or Time[51], are launching apps which make reading or watching news easier, as the formats and fonts are adjusted especially for the screen of a smartphone. It seems that especially younger adults are interested in these kinds of apps, as, according to the already mentioned survey of the Pew Research Center, 77% of young adults prefer to use a smartphone to get news if they have a choice between a mobile device and e.g. a laptop (see Fig. 8-7). The last subperiod of COCA (see Table 8-4 and Fig. 8-6) contains the years in which smartphones have already started to play a big role in the ever-changing landscape of the media. The fact that a growing number of potential readers is turning to mobile devices for news might influence the language in which the articles are written, just like the developments of the nineteenth century very likely had an influence on the writing conventions in the twentieth century.

This influence, if present, could be hypothesized to be directed in a similar way as in the twentieth century – towards shorter sentences, more colloquial and less elaborate variants (see Section 8.1.4). However, it is too early to say whether this influence is considerable, major or just minor. Still, the existence of the phenomenon and its potential implications have to be acknowledged.

[48] Pew Research Center (http://www.pewresearch.org/about/ is, according to the information on the official webpage, "a nonpartisan fact tank that informs the public about the issues, attitudes and trends shaping the world".
[49] https://www.canalys.com/newsroom/smart-phones-overtake-client-pcs-2011.
[50] https://www.theguardian.com/global/ng-interactive/2014/may/29/-sp-the-guardian-app-for-ios-and-android.
[51] https://itunes.apple.com/us/app/time-magazine/id369021520?mt=8.

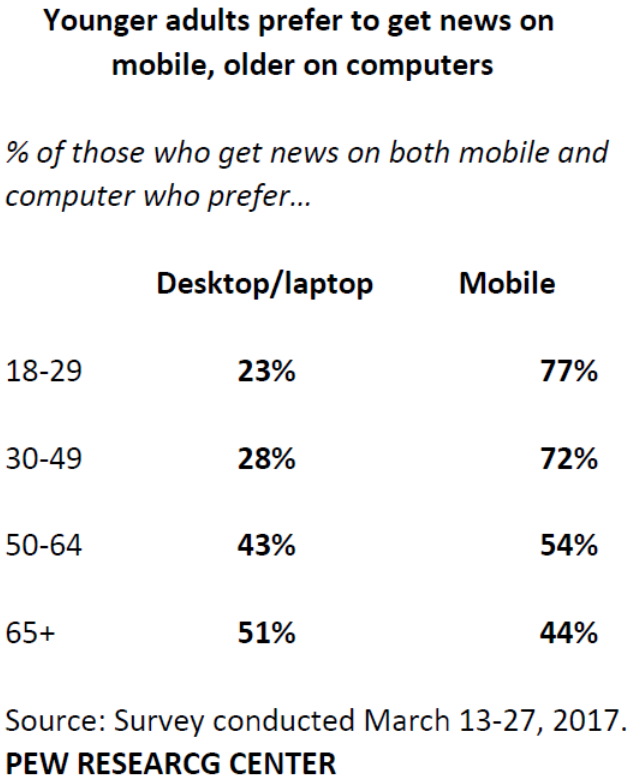


Fig. 8-7: Different age groups and their preference towards mobile and personal computers for getting news (data taken from http://www.pewresearch.org[52]).

8.2 The rise of the to-*infinitive*

The present work has already mentioned the rise of the *to*-infinitive several times in a few different purpose-related and purpose-unrelated contexts. The first context is an observation made by Mair & Leech (2006: 335) concerning a trend in the history of English in which finite clauses are being superseded by non-finite clauses (see the beginning of Chapter 3). The second context has to do with the fact that according to Los (2005: 27) the original function of the *to*-infinitive was that of a purpose adjunct, so the frequency of use of the purposive *to*-infinitives is seen as a very important variable in the present study, see Section 5.2. Furthermore, as hypothesised by Schmidtke-Bode (2009: 174), it is very likely that *in order* was added in front of the purposive *to*-infinitive as a kind of reinforcement of its purposive function after the use of the *to*-infinitive extended greatly in Old and Middle

[52] http://www.pewresearch.org/fact-tank/2017/06/12/growth-in-mobile-news-use-driven-by-older-adults/.

English. Finally, De Smet (2013) looks at the rise of the *to*-infinitive while studying the phenomenon of diffusional spreading in the language. One of the trends he investigates is the rise of *for * to*-infinitives, which are shown to have spread across many different functions over the last five centuries (2013: 79). Along similar lines, the present work suggests that *in order for * to*, which, as a subordinator of purpose, started its existence around the beginning of the twentieth century, might also be a result of the diffusional spreading of *for * to*-infinitives, see Section 5.3.3.

To sum up, the rise of the *to*-infinitive is, from the historical point of view, one of the main phenomena that influenced and shaped the ways and means of expressing purposive relations in English. *To*-infinitive is said to have a purposive function from the very beginning, as argued by Los (2005), who presents a detailed study on the rise of the *to*-infinitive in English. Today, still, as has been visualised in Section 5.6, it is the most common way of expressing purpose. Thus, taking the nature and all the possible implications of the process into consideration, the present work sees the rise of the *to*-infinitive as a higher-order process, influencing higher levels of language organisation than the construction. The present section focuses on the rise of the *to*-infinitive and its assumed competition against the *that*-clause as a possible cause of some of the frequency developments visible in the network of English purpose subordinators (see e.g. Section 4.2.2 and 4.2.3). One of the aims is the identification of changes on the higher levels of language which all influence the construction.

8.2.1 The competition between finite and non-finite clauses

Section 3.1 of the present work presents the five recurrent types of purpose constructions, which, according to Schmidtke-Bode (2009: 199-201) can be identified in the languages of the world. The two most well-known types are finite and non-finite purpose clauses, both of which are used in English. Non-finite purpose realisations, an example of which is a purposive *to*-infinitive, are said to be "the most economical way of expressing purpose" and to "iconically reflect a high degree of integration of the purpose clause into its associated matrix clause" (Schmidtke-Bode 2009: 200).

Can it be that these two types of purposive constructions are in a supra-constructional competition with each other? And if so, since when has this competition been taking place and is it only limited to the relation of purpose?

According to Los (2005: 28), the first function where the *to*-infinitive starts to oust the subjunctive *that*-clause is the function of a purpose adjunct. Nowadays the *to*-infinitive

is probably the most intuitive and most frequent way of expressing purpose (see e.g. Section 5.6). If we add to this the fact that both the purposive *to*-infinitive and its different-subject variant, namely the purposive *for* * *to*-infinitive (see Section 5.3.3), increase in the frequency of use, the suggestion that there still is competition between the two purposive structures looks very plausible. Thus, what we observe in the network of purpose subordinators might also, to some extent, be a result of this competition.

This competition, however, is likely to be a part of a bigger rivalry, which goes beyond the relation of purpose – a larger trend in the language in which *to*-infinitives compete against *that*-clauses (as observed by Los 2005 and Mair & Leech 2006). The rise of the *to*-infinitive did not stop with the *to*-infinitive ousting the subjunctive *that*-clause from the function of a purpose adjunct, on the contrary, *to*-infinitives effectively conquered all the functional environments previously typical of the *that*-clauses. As Los states (2005: 28), the two structures started to compete as early as in late Old English and that already in this period they had become functionally identical:

> There is extensive evidence that subjunctive clause and *to*-infinitive start to compete in late Old English. Such competition indicates that the two structures had become functionally identical. The *to*-infinitive was apparently analysed as a non-finite alternative to the subjunctive clause, i.e. as a non-finite subjunctive [.]

If we add to this all the frequency trends discussed and visualised in Chapters 4 and 5, it seems very plausible that the competition between *that*-clauses and *to*-infinitives, at least in the network of subordination of purpose, is still ongoing.

Another observation which can be made from what the present section discussed, is that, as was the case with regard to phenomena presented in Section 8.1, there seem to be more than one supra-constructional level of the higher-order process which is influencing the language on the constructional level.

8.2.2 Conclusions: the rise of the to*-infinitive and syntactic usage*

Figure 8-8 presents a schema illustrating the developments resulting from the rise of the *to*-infinitive in the context of subordination of purpose, as discussed in the present section. Analogically to Fig. 8-5, a few different levels of change are distinguished, the lowest level in the schema being represented by the construction. All the upper levels exert

an influence on the constructional level, as exemplified here by the decrease in the frequency of use and loss of popularity of constructions such as *lest*, *in order that* and *so that* (see Table 4-1 and Fig. 4-2), and by the increase in the frequency of use in the case e.g. purposive *for* * *to*-infinitive (see e.g. Section 5.3.3).

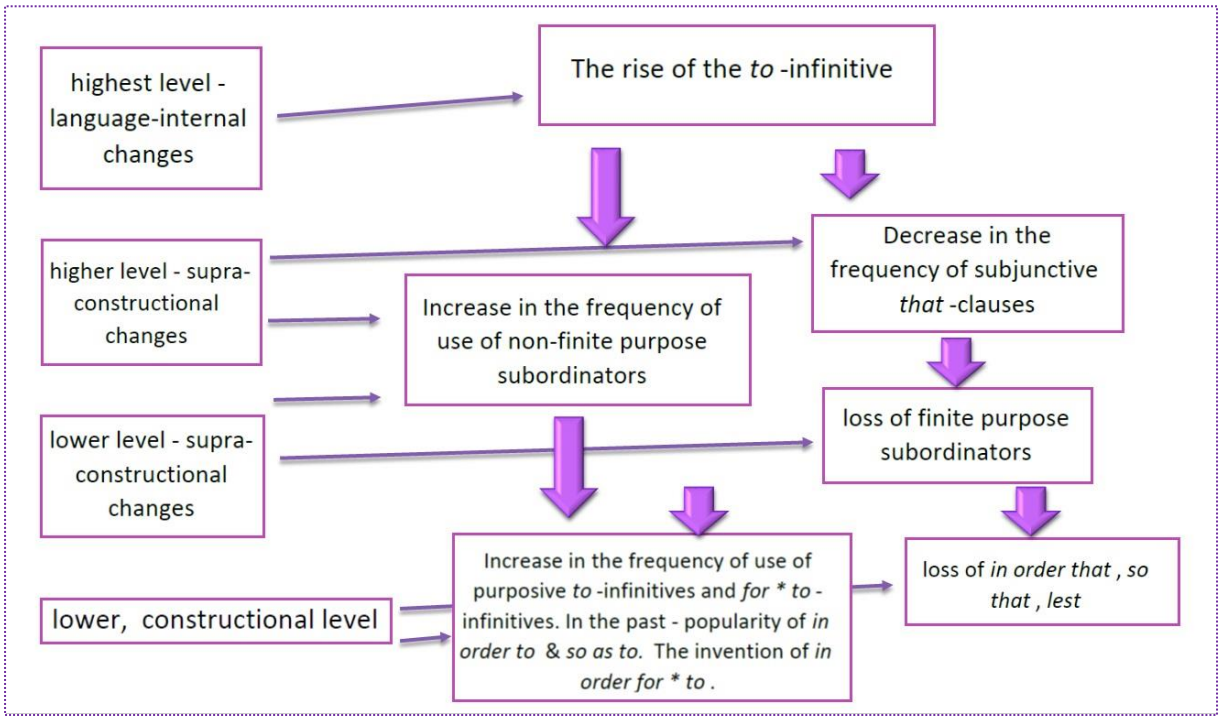


Figure 8-8: An internally-motivated higher-order process influencing the constructional level – a hierarchical schema.

Contrary to the developments discussed in Section 8.1, the changes presented here fall into the category of internally-motivated changes in language. In the terminology of Hickey (2012: 402) "[a]ny change which can be traced to structural considerations in a language and which is independent of sociolinguistic factors can be classified as internally-motivated". Thus, the schema in Fig. 8-8 presents the different levels of change triggered by an internally-motivated higher-order process.

If the rise of the *to*-infinitive is still an ongoing process which, even today, influences the shape of constructional network, as exemplified here by the network of purpose subordinators, where could this process potentially lead to? Is it likely that English will become a language in which purpose is above all expressed with the means of non-finite purpose clauses? Or has this already happened? Even though it might look like the trend is clearly pointing in this direction, it is still a bit too early to draw very far-fetching

conclusions. Although most of the finite purpose subordinators do display a decrease in the frequency of use (see e.g. Fig. 4-2, 5-8 and 5-11), the findings in Section 5.4.5 show that at least one subordinator is still doing fine frequency-wise, namely *so* * + finite clause (see Figs. 5-12 – 5-13). However, as of 2018, the clear dominance of non-finite expressions of purpose in English has to be acknowledged.

8.3 Summary and Conclusions

The main aim of this chapter was to discuss the influence exerted by the so-called higher-order phenomena on the constructional level of the language. Two kinds of higher-order phenomena were distinguished: i) externally-motivated higher-order processes; and ii) internally-motivated higher-order processes. The labels are based on Hickey's terminology concerning language change (2012). An example of the externally-motivated higher-order process is provided by the socio-cultural changes of the nineteenth and twentieth century, which very likely have resulted in the emergence of socio-pragmatic language change processes such as colloquialisation (Mair 1998) and informalisation of the language of the media (Leech et al. 2009). These processes, in turn, are shown to be influencing both the supra-constructional and the constructional level, as presented in Fig. 8-5. An internally-motivated higher-order process is exemplified by the rise of the *to*-infinitive, which as a probably still ongoing development, is also shown to influence various levels of the language higher than the construction, see Fig. 8-8.

The present chapter shows that looking for trends above the constructional level and tracing the links to and between different phenomena and events from the realms of e.g. culture, history and discourse might lead to interesting hierarchical schemas of changes which help us escape from what at first might look like a corridor of mirrors. It is probable that many of the developments in language which at first might look like something seemingly simple and unconnected, or loosely connected but lacking a major cause, might actually turn out to be pieces of a larger and surprisingly logical puzzle e.g. the decrease in sentence length, discussed in Sections 8.1.2 – 8.1.3 or the loss in the frequency of use of *lest*, shown in Fig. 8-8.

Additionally, it seems very probable that there is a lot of interaction between the externally- and internally-motivated higher-order processes themselves. An example of such interaction might be the fact that non-finite purpose subordinators such as *in order to*

and *so as to* do decrease in the frequency of use (see e.g. Section 4.2.1), although they both are "in line" with the trend towards non-finite clauses superseding the finite clauses. Their decrease can thus rather be attributed to the fact that they are not "in line" with processes such as colloquialisation (Mair 1998), informalisation (Leech et al. 2009) and the trend towards less explicitness in writing (e.g. Biber & Gray 2010). Still, even if *in order to* and *so as to* are slowly eliminated from their previous functional niche, what takes over their functions is the default option which is "in line" with both the currently operating externally- and internally-motivated higher-order processes, namely the purposive *to*-infinitive (see Section 5.2.5 and 5.6). Thus, the two kinds of higher-order processes might be viewed as co-existing and cooperating with each other, rather than competing or standing in any kind of opposition. In other words, the constructional level might be viewed as adjusting itself to the highest-level changes and what we see is, to a large extent, a resultant of the higher-order processes in the language "delegating work" to language change processes operating on all the levels "in between".

9. Grammatical obsolescence – Discussion and Conclusions

It ain't over until the fat lady sings

There are three major goals of this (final) chapter of the present dissertation. The first one is to complete the practical part of this work by presenting a clear and concise review of results of the studies that have been conducted in the previous chapters. Having these results at hand, we will go down the criteria catalogue for the investigation of obsolescence in the form of a decision tree, which was presented in Section 2.3 and in Fig. 2-6. A separate section is devoted to each of the studied constructions (Sections 9.1.1 – 9.1.5).

The second goal is to discuss whether, on the basis of the outcomes of the decision tree procedure and all the conclusions drawn in particular chapters, we can say that any of the investigated constructions is obsolescent. The conclusions with regard to this question are presented Section 9.2.

The third goal is to complete the theoretical part of this work by addressing the various considerations concerning obsolescence as a process in its own right and by offering answers to questions raised in Sections 1.2 and 1.5. This last goal shall be achieved by looking at obsolescence as a process in its own right, both from the theoretical and from the empirical side, and by referring to and building on some of the ideas expressed in the literature on the topics of loss and decline (see Section 1.5).

9.1 Criteria catalogue in practice: going down the decision tree

In the preceding chapters we collected insights into all the criteria for obsolescence enumerated in Fig. 2-2 (repeated in Fig. 9-1), namely of i) negative correlation between time and the frequency of use; ii) competition on the constructional level; iii) distributional fragmentation; iv) paradigmatic atrophy; v) higher-order processes influencing the constructional level. Because Chapters 4-8 now provide all the necessary pieces of information with regard to the particular constructions and particular criteria from the criteria catalogue, we are ready to conduct the decision tree procedure (see Section 2.3, Fig. 2-6).

Each of the purpose subordinators in focus of this study will be looked at. The following sections address one construction each: Section 9.1.1 is devoted to *in order to*, 9.1.2 to *in order that*, 9.1.3 to *in order for * to*, 9.1.4 to *so as to* and 9.1.5 to *lest*.

Since, as was specified in Section 4.1, one of the aims of this dissertation was, "apart from concentrating on the study and the description of grammatical obsolescence, to contribute to the better understanding of the similarities and differences between the language of Late Modern English and Present Day English", in the case of each of the constructions there will be two subperiods distinguished, namely from approximately 1810 to 1890 (representing part of the Late Modern English period) and from 1900 to 2000 (representing the Present Day English period).

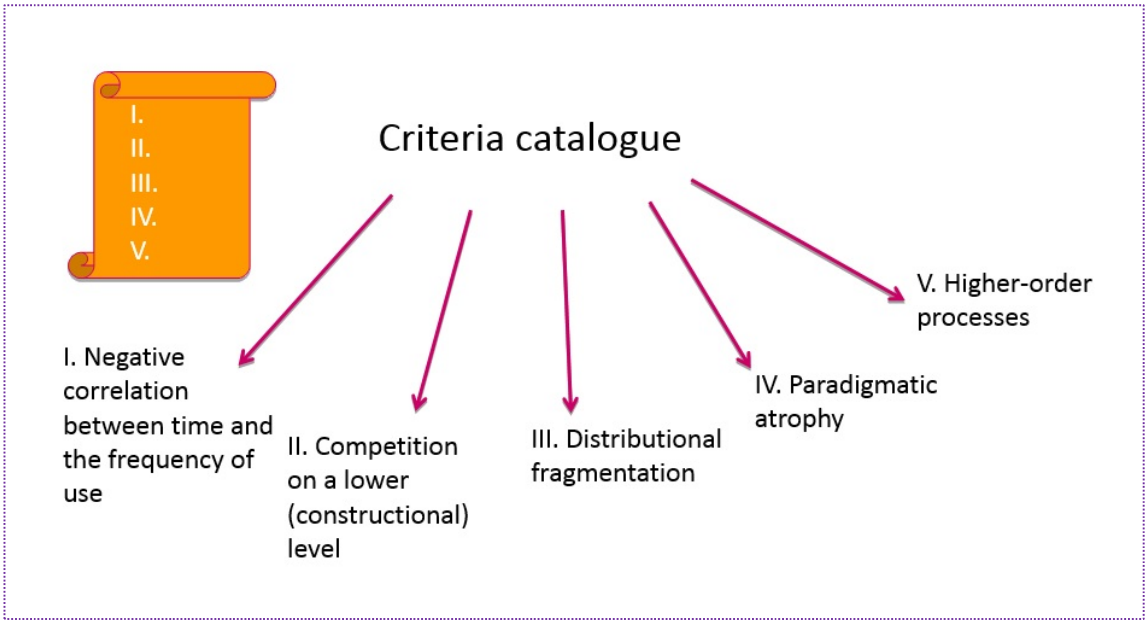


Fig. 9-1: Criteria catalogue for the investigation of obsolescence (Fig. 2-2 of this dissertation).

9.1.1 In order to

In order to is the most frequent of the five constructions investigated. Table 9-1 sums up the results with regard to each of the criteria from the criteria catalogue (see Fig. 9-1) in the two subperiods – 1810-1890 and 1900-2000. As we can see, *in order to* fulfils the first necessary condition[53] for grammatical obsolescence, namely the presence of negative correlation between time and the frequency of use, only for the second

[53] For the discussion of necessary and sufficient conditions with regard to obsolescence, see Section 2.1.

subperiod. Thus, we only treat this time period as potentially interesting in the context of obsolescence. Out of all the five criteria, we have a positive result in the case of four. Only for one criterion, the presence of paradigmatic atrophy, do we have a negative outcome – no signs of shrinking of the construction's paradigmatic potential have been observed. Figure 9-2 presents the visualisation of the decision tree procedure – we use arrows to show the way we go down the tree with the answers from Table 9-1.

Criteria for the investigation of obsolescence	***in order to***	
	Time period 1810-1890	**Time period 1900-2000**
Negative correlation between time and the frequency of use (see Table 4-3 and Section 4.4.4)	No, there is no negative correlation. The results: tau = -0.5 p-value = 0.07518 *non-significant (or ms)*	Yes, there is negative correlation. The results: tau = -0.8181818 p-value= 0.0001323 ***
Competition on the constructional level	_____	Yes, there might be competition with the purposive *to*-infinitive (see Section 5.2.5).
Distributional fragmentation	_____	Yes, there are signs of distributional fragmentation (see Sections 6.1.3 & 6.2.2; Figs. 6-1 & 6-5).
Paradigmatic atrophy	_____	No, there are no signs of paradigmatic atrophy (see Sections 7.1.6, 7.2.3).
Higher-order processes	_____	Yes, there has been at least one higher-order process identified, namely the socio-cultural changes of the 19th century (see Section 8.1.4 & Fig. 8-5).

Table 9-1: Sum-up of results with regard to different criteria for obsolescence: *in order to*.

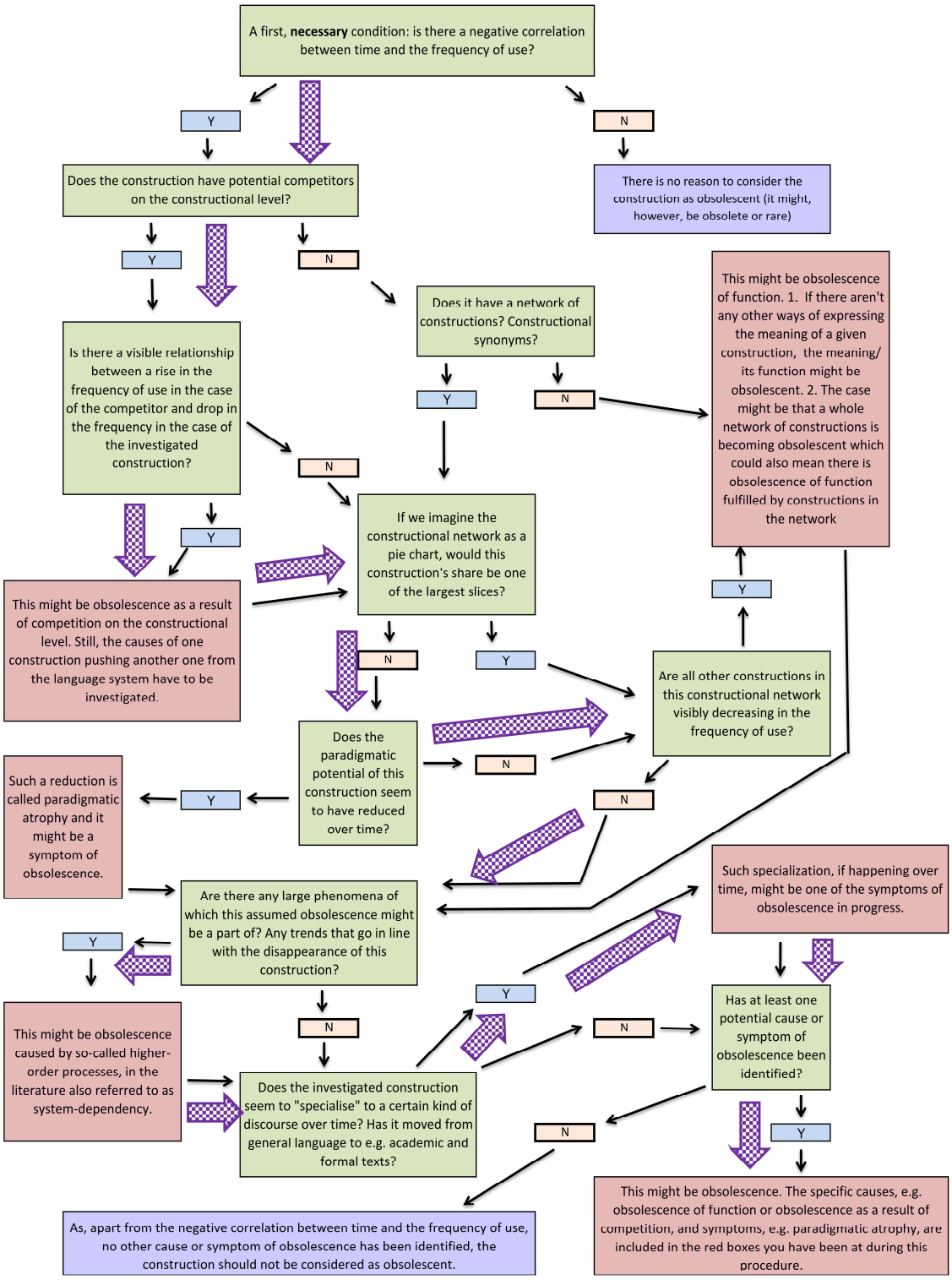


Fig. 9-2: Going down the decision tree – *in order to*.

According to the answer we arrive at, what we observe in the case of *in order to* might be obsolescence. Among the accompanying causes there is, apart from the negative correlation between the frequency of use and time, the phenomenon of distributional fragmentation, as *in order to* shows a preference towards more formal genres, such as *academic* and *non-fiction* texts and this preference seems to be increasing with time (see Sections 6.1.3 and 6.2.2; Figs. 6-1 and 6-5). When it comes to causes, there is competition on the constructional level and the presence of at least one higher-order phenomenon. However, we have the knowledge that the increase in the frequency of use of the potential competitor, the purposive *to*-infinitive, is definitely larger than the decrease displayed by *in order to* (see Table 5-5, Section 5.2.5). Thus, we should not treat competition on the constructional level as the main cause for the potential obsolescence. An externally-motivated higher-order process identified in Section 8.1.4, namely the socio-cultural changes of the 19th century, along with all the processes resulting from it and accompanying it (see Fig. 8-5) provides a much better explanation for the decrease in the frequency of use of *in order to*. Support for this hypothesis is also offered by the fact that the decrease in the frequency of use started around the beginning of the twentieth century. As shown in Table 4-3, in the time period from the beginning of the 19th century to the beginning of the 20th century there is no negative correlation between the time and the frequency of use.

9.1.2 In order that

In order that is currently the rarest construction out of the five studied variants. Table 9-2 presents a summary of the results we got for *in order that*. As was the case with *in order to*, the first and necessary condition for grammatical obsolescence is only fulfilled for the time period 1900-2000, whereas in the data representing the time period of 1810-1890 we can observe the presence of a statistically significant positive correlation between the time and the frequency of use. When it comes to other criteria, the situation looks exactly as in the case of *in order to*. Only one criterion is not fulfilled – paradigmatic atrophy.

Figure 9-3 presents the decision tree procedure conducted for *in order that*. The visualisation looks identical to what we saw in Fig. 9-2 (*in order to*). Some degree of distributional fragmentation has been detected (see e.g. Fig. 6-2 and 6-9) and the preferred genres are *academic texts* and *non-fiction*. Actually, in the case of *in order that*,

the preference towards one particular genre seems to be strongest when compared to other subordinators studied by this work, see Table 6-5.

Criteria for the investigation of obsolescence	***in order that***	
	Time period 1810-1890	**Time period 1900-2000**
Negative correlation between time and the frequency of use (see Table 4-3 & Section 4.4.4)	 No, there no negative correlation. The results: tau = 0.6111111 p-value = 0.02474 *	 Yes, there is negative correlation. The results: tau = -0.9636364 p-value = 5.511e-07 ***
Competition on the constructional level	_____	 Yes, there might be competition with (*in order) for* * *to* (see Section 5.3.5) and *so* * + finite clause (see Section 5.4.6).
Distributional fragmentation	_____	 Yes, there are signs of distributional fragmentation (see Sections 6.1.3 & 6.2.2; Figs. 6-2 & 6-9).
Paradigmatic atrophy	_____	 No, there are no signs of paradigmatic atrophy (see Sections 7.1.6, 7.2.3).
Higher-order processes	_____	 Yes, there have been two higher-order processes identified, namely the socio-cultural changes of the 19th century (see Section 8.1.4 & Fig. 8-5) and the rise of the *to*-infinitive (see Section 8.2.2; Fig. & 8.8).

Table 9-2: Sum-up of results with regard to different criteria for obsolescence: *in order that*.

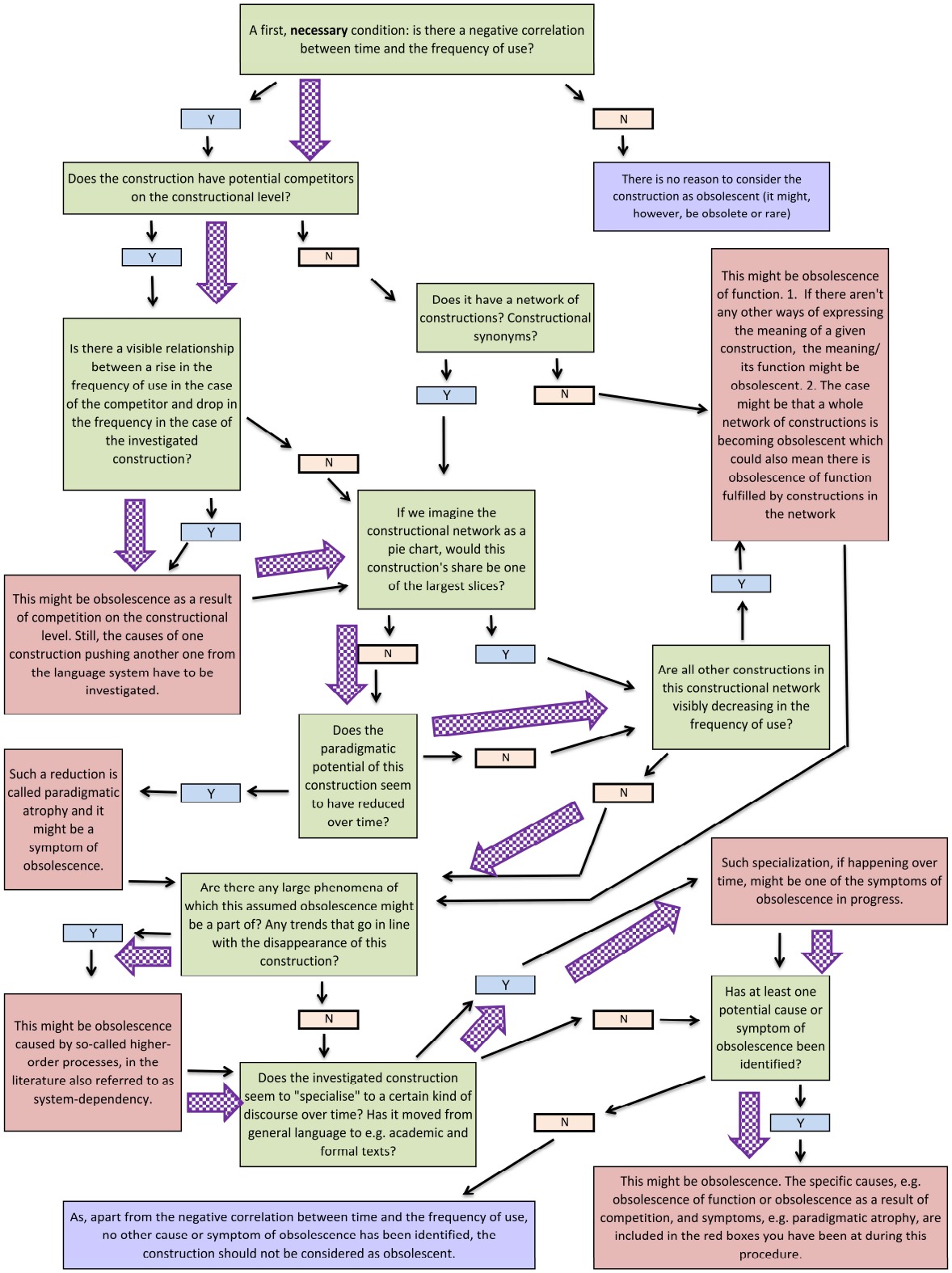


Fig. 9-3: Going down the decision tree – *in order that*.

Among the causes for the decrease in the frequency there is competition on the constructional level. with e.g. (*in order) for * to* and *so* + finite clause, and higher-order processes. However, as was the case with *in order to*, what looks like competition between constructions is actually more likely to be a result of changes induced by higher-order processes. With regard to *in order that*, there are two such processes, one externally-motivated (socio-cultural changes of the 19th century, see e.g. Section 8.1.4) and one internally-motivated (the rise of the *to*-infinitive, Section 8.2.2). *In order that* is not "in line" with any of these two trends of change, which explains the fact that the decrease in the frequency of use is, in its case, most dramatic.

Still, the fact that the decrease in the frequency of *in order that* starts around the beginning of the twentieth century probably means that the socio-cultural changes of the nineteenth century play a more important role than the rise of the *to*-infinitive, which even though still ongoing, started much earlier.

Additionally, the obsolescence of *in order that* is likely to be linked to the findings from the history of adverbial subordination (Kortmann 1997: 310), namely the shrinking of the role played by *that* as "a marker of any kind of subordinate clause in Late Modern English". Whether this phenomenon has been related to any of the abovementioned higher-order processes is not completely clear at this stage, but there definitely might be an interrelation, as has been suggested in Section 5.3.3 of the present work.

*9.1.3 In order for * to*

*In order for * to* is the youngest of the studied constructions and the second rarest (see Table 4-1). It fails to fulfil the first and necessary condition for grammatical obsolescence, as in its case the correlation between the time and the frequency of use is not negative, but positive (and statistically significant). Because of this fact, *in order for * to* cannot be treated as a candidate for obsolescence, as stated in the explanation in the decision tree, see Fig. 9-4, "There is no reason to consider the construction as obsolescent (it might, however, be obsolete or rare)". *In order for * to* is, however, definitely not obsolete, but simply still decidedly rare.

Criteria for the investigation of obsolescence	*in order for * to*	
	Time period 1810-1890	**Time period 1900-2000**
Negative correlation between time and the frequency of use (see Table 4-3 & Section 4.4.4)	_____	No, there no negative correlation. The results: tau = 0.6363636 p-value = 0.005707 **

Table 9-3: Sum-up of results with regard to different criteria for obsolescence: *in order for * to*.

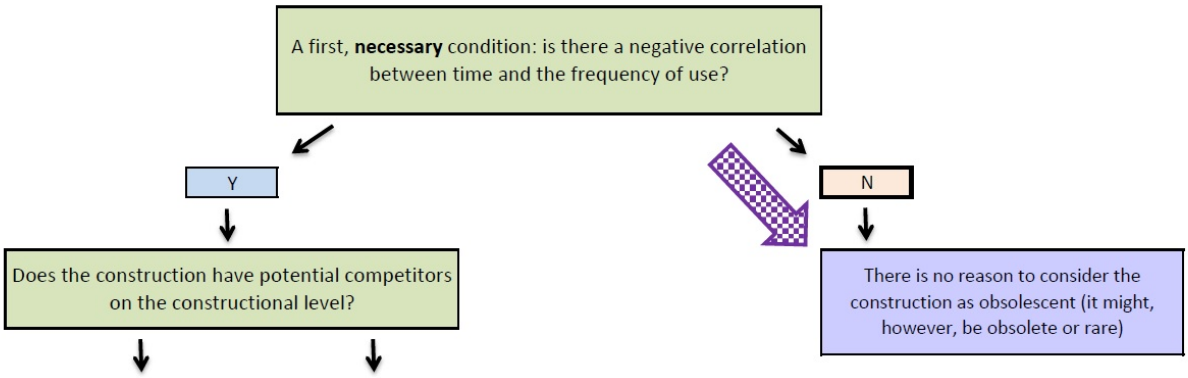


Fig. 9-4: Going down the decision tree – *in order for * to*.

9.1.4 So as to

In the case of *so as to*, the presence of negative correlation between time and the frequency of use in the time period 1900-2000 has been detected. For the earlier time period there has been no correlation identified, which might also be caused by the apparent surge in the frequency displayed by *so as to* between 1810 and 1830 (see Fig. 4-1). One could speculate that what we see is a result of data pollution; however, nothing similar has been observed for any other investigated variant. As we can read in Table 9-4, out of five criteria, all five are fulfilled. Figure 9-5 presents the visualisation of the decision tree procedure

Criteria for the investigation of obsolescence	*so as to*	
	Time period 1810-1890	**Time period 1900-2000**
Negative correlation between time and the frequency of use (see Table 4-3 & Section 4.4.4)	 No, there no negative correlation. The results: tau = -0.05555556 p-value = 0.9195 *(non-significant)*	 Yes, there is negative correlation. The results: tau = -0.9636364 p-value = 5.511e-07 ***
Competition on the constructional level	_____	 There might be competition with the purposive to-infinitive (see Section e.g. 5.2.5).
Distributional fragmentation	_____	 Yes, there are signs of distributional fragmentation (see Sections 6.1.3 & 6.2.2; Figs. 6-3 & 6-7).
Paradigmatic atrophy	_____	 Some of the developments might qualify as paradigmatic atrophy (see Section 7.2.3; Table 7.7).
Higher-order processes	_____	 Yes, there have been two higher-order processes identified, namely the socio-cultural changes of the 19th century (see Section 8.1.4 & Fig. 8-5) and the rise of the *to*-infinitive (see Section 8.2.2; Fig. & 8.8).

Table 9-4: Sum-up of results with regard to different criteria for obsolescence: *so as to*.

When it comes to potential symptoms of obsolescence, the criterion of distributional fragmentation is fulfilled for *so as to*, and the "preferred" genres are, as was the case for *in order to* and *in order that*, *academic texts* (COCA) and *non-fiction* (COHA). Out of the five constructions investigated by this work, *so as to* is the only one that fulfils the criterion of paradigmatic atrophy. However, if it had not been for the

overall trend of decrease in the frequency, what we observe could also be viewed as a shift in the paradigmatic potential (see Section 7.2.3), namely there is a steady and quite marked (over 40% in the last two decades of the studied period) increase of the fraction of *so as to* instances realised as the negative variant of this construction – *so as not to* (see Sections 7.2.2 and 7.2.3; Table 7-7 and Fig. 7-6). Furthermore, a development of this kind might suggest a possibility of competition between *so as not to* and *lest*. However, the figures in Table 5-13 and line plots in Fig. 5-14 (see Section 5.5.2) do not show any interrelation between the decrease in the frequency of *lest* and the apparent increase in the frequency of *so as not to*.

Among the causes for potential obsolescence of *so as to* there is competition with the purposive *to*-infinitive, but, as was the case with *in order to*, the differences in the frequency gains and losses displayed by the purposive *to*-infinitive and *in order to* and *so as to* are too large (see Section 5.2.5 and Fig. 5-5) for it to be considered as the sole cause. Again, as was hypothesized with regard to *in order to*, a plausible cause for the decrease in the frequency of use is a higher-order process, namely socio-cultural changes of the 19th century along with trends of change and processes resulting from and accompanying it, such as e.g. colloquialisation (Mair 1998), informalisation of the language of the media (Leech et al. 2009) and change in the punctuation practices (see e.g. Sections 8.1.2, 8.1.4 and Fig. 8-5).

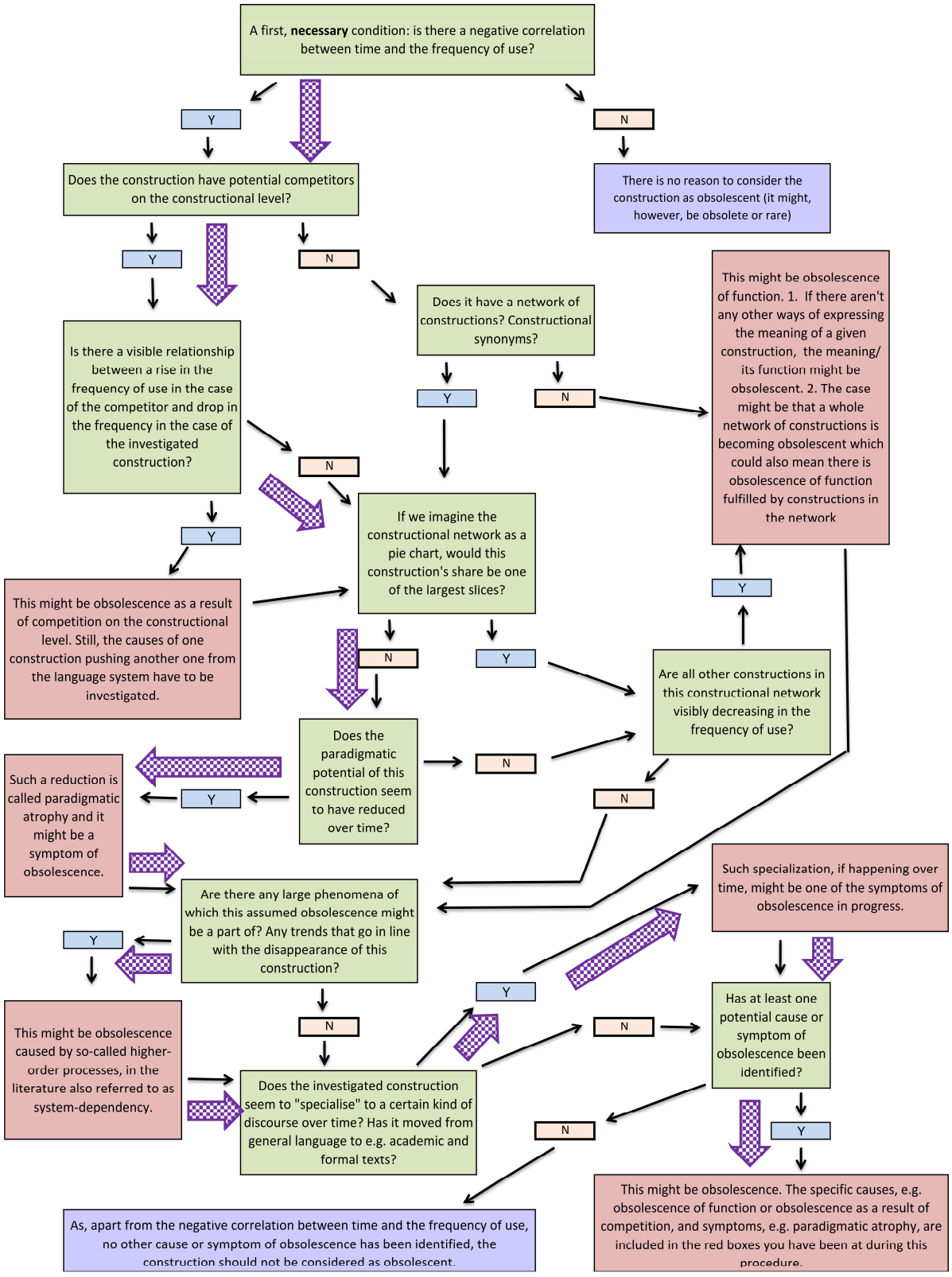


Fig. 9-5: Going down the decision tree – *so as to*.

9.1.5 *Lest*

Lest is the only subordinator of purpose for which there is a negative correlation between time and the frequency of use for both time periods – 1810-1890 and 1900-2000. The other criteria, except for the criterion of paradigmatic atrophy, are also fulfilled, see Table 9-5 and Fig. 9-6. However, the investigation of distributional fragmentation yielded different results for *lest* than for other subordinators. To be specific, *lest* has been shown to have a preference for texts from the domains of religion, philosophy, science-fiction and fantasy rather than to concentrate in any specific genre, see Table 6-3, Fig. 6-4 and 6-10. This, as has been pointed out in Section 6.1.4, might have to do with the fact that *lest* is often followed by the subjunctive, which is frequently referred to as overly formal and already somewhat unusual.

On the other hand, *lest* is sometimes deliberately applied in some "non-mainstream" texts because of exactly this overly formal undertone to e.g. give them an archaic or erudite touch, see Section 6.1.4. Another possibility is that the use of *lest* is part of the writing conventions in certain topical domains such as religion and philosophy. The potential presence of formulaic sequences of text and quotations from older sources is also characteristic of the two topical domains. Yet another observation, which has been made on the basis of the frequency distributions in COHA, COCA and NOW, is the possibility of *lest* becoming a part of a fixed, idiomatised expression, namely *lest we forget,* see Section 5.5.4.

When it comes to the causes of potential obsolescence, one likely scenario is a situation in which *lest* is being ousted from the language because it is not "in line" with the rise of the *to*-infinitive (see Section 8.2.2 and Fig. 8.8), a higher-order process which has been at work since a few centuries. As *lest* often takes a subjunctive clause, it might be in an unprivileged position.

The second higher-order process looked at by this work, namely the socio-cultural changes of the 19th century, is also very likely to be contributing by the means of processes such as colloquialisation (Mair 1998) or informalisation of the language of the media (Leech et al. 2009), which certainly do not work in favour of overly formal expressions.

Criteria for the investigation of obsolescence	*lest*	
	Time period 1810-1890	**Time period 1900-2000**
Negative correlation between time and the frequency of use (see Table 4-3 & Section 4.4.4)	 Yes, there is negative correlation. The results: tau = -0.7777778 p-value = 0.002425 **	 Yes, there is negative correlation. The results: tau = -0.8909091 p-value = 1.373e-05 ***
Competition on the constructional level	 Yes, there might be competition with *so* * + finite clause (see Section 5.5.3).	 Yes, there might be competition with *so* * + finite clause (see Section 5.5.3).
Distributional fragmentation	_____	 Yes, there are signs of distributional fragmentation and potential fixed expressions building (see Sections 5.5.4, 6.1.3 & 6.2.2; Table 5-14 & 6-3; Figs. 6-3 & 6-7).
Paradigmatic atrophy	 No, there are no signs of paradigmatic atrophy (see Sections 7.1.6 & Table 7-5).	 No, there are no signs of paradigmatic atrophy (see Sections 7.1.6 & Table 7-5).
Higher-order processes	 Yes, there have been two higher-order process identified: the rise of the *to*-infinitive (see Sec. 8.2.2) & the socio-cultural changes of the 19th century (see Sec. 8.1.4).	 Yes, there have been two higher-order process identified: the rise of the *to*-infinitive (see Sec. 8.2.2) & the socio-cultural changes of the 19th century (see Sec. 8.1.4).

Table 9-5: Sum-up of results with regard to different criteria for obsolescence: *lest*.

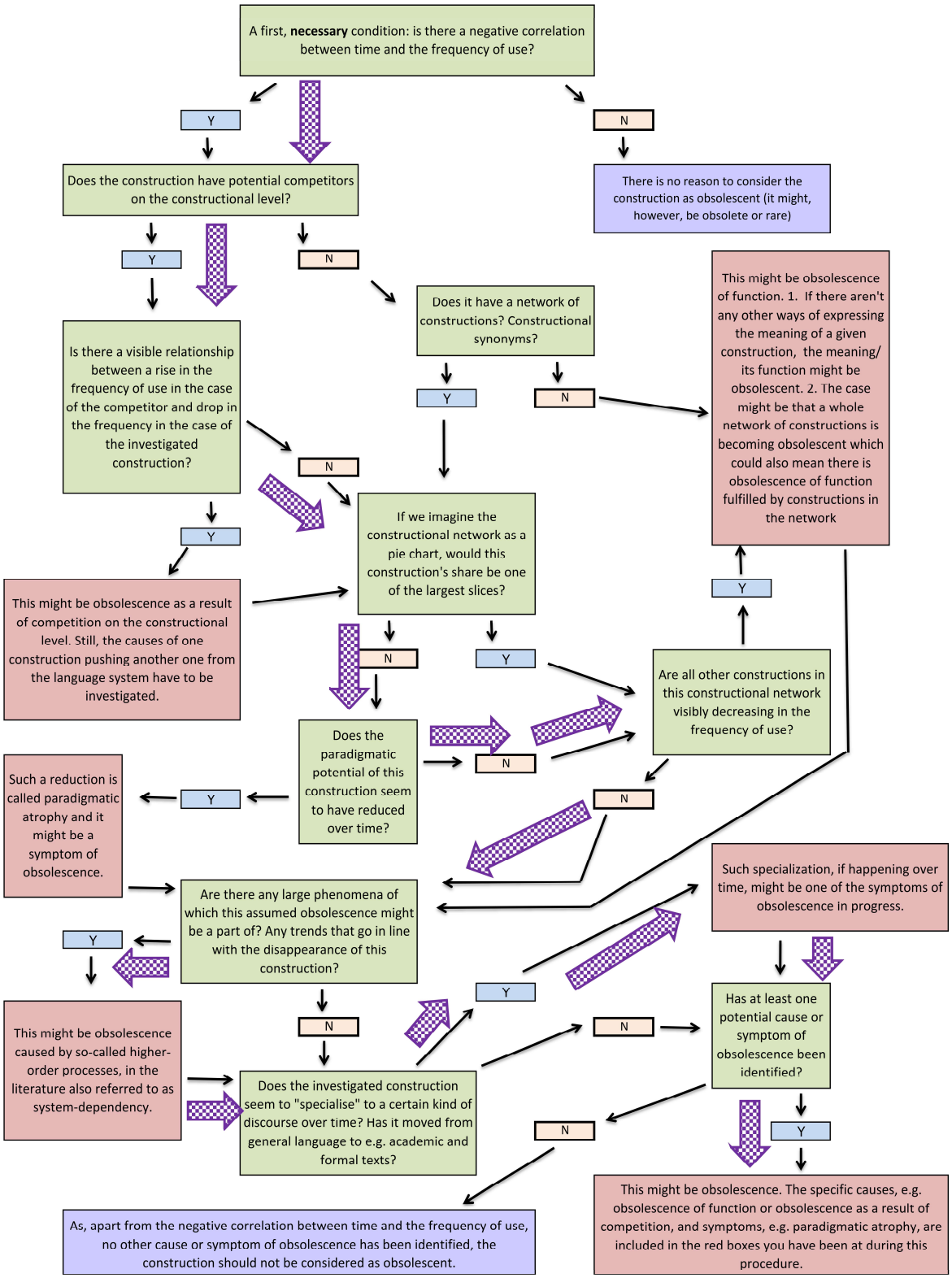


Fig. 9-6: Going down the decision tree – *lest*.

As the previous sections show, there are many different frequency-related, genre-related and language change-related developments in the network of English purpose subordinators, which are interesting in the context of grammatical obsolescence. Summing everything up, the decision tree procedure pointed in the direction of potential obsolescence in the case of four (*in order to*, *in order that*, *so as to*, *lest*) out of five constructions.

At this point one observation has to be made which concerns all the case studies investigated in the present work. It the case of none of them did we reach the branch of the decision tree pointing to obsolescence of function. While one of the first thoughts upon seeing so many subordinators of purpose decreasing in the frequency of use could be "Maybe people tend to speak and write about their goals less now than they used to in the past", this is clearly not the case. Thus, the developments observed in the network of subordinators of purpose all represent obsolescence of form, while the function is still there, only that it is being expressed with the use of different means. This obviously does not mean that obsolescence of function is impossible. It only proves that in the one network we look at in the present work, all the constructions seem to represent the same type of obsolescence.

However, one of the final questions that still need to be asked and answered is if we can indeed say that *in order to*, *in order that*, *so as to* and *lest* are obsolescent? Bearing in mind the frequency trends observed, results yielded and conclusions drawn in the case of three of them, namely *in order that* (see Section 9.1.2), *so as to* (see Section 9.1.4) and *lest* (see Section 9.1.5), a positive answer to this question could very probably be accepted without major objections. The only "problematic" construction is *in order to*, mostly because of the fact that its current frequency of use is still relatively high (see Table 4-1, Fig. 4-2 and 4-3).

Still, as has been discussed in Section 1.2, there are no frequency thresholds determined in linguistics which would classify a construction as e.g. *frequent*, *infrequent* or *very rare*. One option to talk about the frequency without giving any specific values could be to only look at the constructional network and make decisions based on the shares of the whole taken by a given construction. In the case of *in order to* this approach has led to interesting and somewhat unexpected results, see Section 5.6, namely if we only look at the non-finite ways of expressing same-subject purpose, *in order to* accounts

for only 2.7 % of the whole in the decade 2000 compared to 7.8 % in the 1900, whereas the purposive *to*-infinitive accounts for 89.4% (1900) compared to 97.1 (2000) – so it seems to increasingly dominate the picture. Is this tendency, together with all the detected symptoms, causes and the hints provided by the decision tree procedure, enough to say that *in order to* is obsolescent?

There is no reasons to say no if we only treat *in order to* as a construction fulfilling a function of a subordinator of purpose, which came into being as a reinforcement for the purposive *to*-infinitive after its use expanded in the Old and Middle English period (Schmidtke-Bode 2009: 174, see e.g. Section 5-2), and which is to a large extent a synonym for the purposive *to*-infinitive. However, the language has changed since the times *in order to* came into being and, potentially, so did the function of *in order to*.

As has been discussed in Section 8.1.3, *in order to* shows preference towards *non-fiction* and *academic texts*. There are at least three reasons which might explain this tendency. One has to do with the fact that *in order to* can still fulfil its original function of providing disambiguation and precision in these kinds of texts, as they have potentially more complex structure and longer sentences, see e.g. Fig. 8-3. The second reason is that in general, the constructions in question seem to belong to the writing conventions of these genres, which in turn tend to be somewhat less prone to e.g. the processes such as colloquialisation. The third reason lies at the intersection of the two previous reasons and is actually a hypothesis that *in order to* has slightly changed its original function of being an every-day purpose subordinator and is on the way of becoming more of a marker of style – more elaborate, elegant, highbrow kind of an expression, but not in an archaic way (see Section 8.1.3). By becoming something more than just a reinforcement of the purposive function of the *to*-infinitive, *in order to* might actually avoid reaching the very low ranges of the frequency scale and becoming a truly archaic piece of linguistic structure.

A process like that could be viewed as a specialisation towards a slightly different and more style-oriented role in the discourse, which is decidedly less “mainstream” than its previous role. Thus, the lower frequencies might not mean obsolescence here, but a shift in the range of functions. However, a potential development of this kind is still very young and it will take some time before this hypothesis can be either supported or rejected, as in the language of today there are still instances of *in order to* fulfilling its

original function and some used in the newer role, a situation which could be compared to the phenomenon of layering in grammaticalisation (Hopper 1991).

Another question with regard to *in order to* is why would *in order to*, and not *so as to* or *in order that*, be chosen to have a new function? There probably are at least a few reasons, but one of the most important is the frequency of use – the same variable which raised doubts with regard to its potential obsolescence. *In order to* is, and has been for the past two centuries, the most frequent of the purpose subordinators studied by this work. It is also "in line" with the rise of the *to*-infinitive. Moreover, it came into being even though *so as to* has already been there (see Sections 3.2.1 and 3.2.4), and although it was a new expression, it did manage to reach higher frequencies of use and presumably higher popularity. Thus, what we observe might be a frequency effect of a certain kind, namely if most of the constructions constituting a given constructional network show a very marked decline in the frequency of use, it is the most frequent one that is most likely to adjust itself to the new situation and develop new functions.

All of the considerations about *in order to* lead us to asking a similar question about *lest* – even though *lest* used as a subordinator of purpose seems to be clearly obsolescent – what about it becoming a part of a fixed idiomatic expression, namely *lest we forget* (see Section 5.5.4)? It does not look as if becoming part of an idiom could be classified as exaptation, what is it then? A very suitable description of the current situation of *lest* is provided by the ideas of Schlechtweg & Eckmann (2018) who, in their work, divide outdated expressions into three groups containing instantiations of i) fossilisation, ii) weak fossilisation and iii) archaisms. In this classification *lest* would fall into the category of weak fossilisation, which encompasses items mainly occurring in (loose) phraseologisms but which still appear also outside of the fixed phrase, e.g. "the powers that be" or "if need be". *Lest* can clearly still occur both as a subordinator of negative purpose and as part of *lest we forget* expression, although in the newer sources, the latter use seems to prevail (see Table 5-14).

If *lest* can currently be subsumed to be an instantiation of weak fossilisation, will it, in the future, become a real fossil, used only as part of the *lest we forget* expression? Even though it sounds like a very plausible scenario, it probably will not happen any soon, as we should not forget about the potential of *lest* to be used in texts humorously or ironically stylised to look more pompous, or as an attempt to mimic historical sources (see e.g. Section 6.2.2). Also, the fact that e.g. religious texts show a certain degree of

affinity for *lest* (see Section 6.1.4) might lengthen the process in which *lest* could potentially get "encapsulated" into a fossil.

There is still one more thing differentiating *lest* from other constructions instantiating cases of obsolescence and studied by this work, namely the fact that *lest* seems to have potentially been obsolescent for the last two centuries, whereas *in order that*, *so as to* and *in order to* started to display a decrease in the frequency of use from around the beginning of the twentieth century. The fact that *lest* is the only subordinator which might be referred to as already potentially obsolescent towards the end of the Late Modern English period supports the hypothesis according to which the main cause for the obsolescence of *lest* is the rise of the *to*-infinitive and the decline of subjunctive (see Section 8.2.2; Fig. 8-8). On the other hand, for both *in order to* and *so as to*, it seems that the socio-cultural changes of the 19th century have played a more important role (see Fig. 8-5).

A few words shall still be said about *in order that*, even though it does not look like there were any possible doubts as for its status as obsolescent. Considering the fact that *in order that* has never been particularly frequent and popular, and as a construction not "in line" with any of the two higher-order processes discussed in Sections 8.1.4 and 8.2, one might ask a simple but brutal question, namely why did *in order that* even come into being? A probable answer is – as an analogy to *in order to* used for different-subject situation. It shared the syntagm *in order* with the relatively promising *in order to* so it did manage to establish itself among the subordinators. It, however, never reached a frequency comparable to its non-finite counterpart.

Thus, taking into consideration all the insights into the situation of *in order that*, the present work suggests it might be classified as instantiating a case of marginalisation, a notion introduced by Hansen (2017: 264) and referring to a process which, as opposed to grammaticalisation "does not lead to the rise of an unmarked, highly frequent grammatical operator, but to elements which occupy a peripheral position in the language system, i.e. which are either stylistically restricted or co-occur with a limited number of verbs". The present work adds that there are higher chances of a constructional development to turn out to be a case marginalisation if this development is not "in line" with the higher-order processes operating in the language during the time period in question. *In order that* is against the trend of the rise of the *to*-infinitive and, additionally, as a lengthy construction with a formal undertone (which is not the case for its functional equivalents *so* + finite clause and *for* * *to*-infinitives) it also does not fit to the processes

constituting part of the socio-cultural changes of the 19th century such as colloquialisation. It does seem to be against both of the higher-order processes suggested to be operating at the intersection of the Late Modern and Present Day English period. Additionally, *in order that* has never reached high frequency of use and popularity and is much younger than e.g. *lest*. So it is very unlikely that it might be changing its function or even becoming a part of a fixed expression. The most likely scenario for *in order that* is a disappearance from the active language use, possibly in a not very far future, and in a silent and unnoticed way.

The last construction which has been mentioned several times, but which still needs a few more words, is *so as to*, which is already very rare, and the decrease of which is proceeding at a much faster rate than of e.g. *in order to*. As has been described in Section 9.1.4, *so as to* fulfils all the criteria for obsolescence collected in the criteria catalogue for the investigation of obsolescence, see Fig. 2-2 or 9-1. Even though, as a non-finite construction, it is "in line" with the rise of the *to*-infinitive, it does not fit well into the socio-cultural changes of the 19th century (see Section 8.1.4 and Fig. 8-5). And since the much more frequent *in order to* already seems to have taken the niche of functioning as a different type of a purpose subordinator than it originally was meant to be, *so as to* is likely to be facing the end of its presence in the language. However, as has been shown and discussed in Section 7.2.3 (see also Table 7-7), *so as to* has potentially also been "looking for" a different functional niche than it occupied before. As in the last two decades of the twentieth century over 40% of all instances of *so as to* have been realised by its negative variant, *so as not to*, and even though it would be an exaggeration to e.g. see *so as not to* as one of the most important constructions in the constructional network of subordinators of negative purpose (see e.g. Fig. 5-14), it seems to be a quite surprising development which is interesting to watch. Considering the fact that subordination of negative purpose has never been the default function of *so as to*, this trend might even be something more than just a sign of paradigmatic atrophy. However, right now it is hard to say whether this slight shift in the paradigmatic potential of *so as to* is a sign of it becoming obsolescent or a strategy to prolong its constructional existence. Has it not been for the figures in Table 5-13, it would be justified to see the development in question as a potential sign of direct competition between *so as not to* and *lest*. The lack of any visible correlation between the frequencies of the two constructions in question (see Table 5-13 and Fig. 5-14) makes speculations of this kind rather hard to be

taken seriously. Still, with regard to the positive variant, the previous default, *so as to*, the situation is clear and points in the direction of obsolescence.

9.3 Obsolescence as a process in its own right: Conclusions

As has been stated in Section 1.2, this work defines grammatical obsolescence in the following way:

> Grammatical obsolescence describes a situation in which a previously popular and productive construction is, often gradually, losing its productivity and popularity over time until the construction disappears or there are only residues or fossilised forms left. The function of the obsolescent construction may discontinue or continue to be (fully or partially) expressed by alternative means.

Building on the foundations laid in Sections 1.2, 1.3, 1.4 and 1.5, one of the aims of the present work was to look for and point to common grounds, new links and interrelations between obsolescence and various language change processes such as e.g. constructional change, grammaticalisation and exaptation. The present section revisits the questions raised in Chapter 1 and aims at providing a description of grammatical obsolescence viewed as a process in its own right. It is hoped that the comprehensive study of different symptoms and causes of obsolescence conducted and presented in Chapters 4-8 enrich the discussion with insights that enable us to put together the different pieces of the puzzle represented by the processes and phenomena mentioned in Section 1.5.

First of all, let us refer to the statement of Haspelmath (2004: 33), namely "[e]verything in language can become obsolete, independently of its degree of grammaticalization". In general, the findings from the present dissertation do seem to support this somewhat controversial statement. However, there are a few remarks that should be added to it. Firstly, it does not seem very likely that any construction, which has established itself in the language, could become obsolete in an "out of the blue" fashion. There always are some "forewarnings", among which there are i) a noticeable decrease in the frequency of use, be it slow and gradual or quick and sudden; ii) distributional fragmentation – an increasing restriction of a construction to certain genres and registers (e.g. Hundt & Leech 2012; see Chapter 6); iii) paradigmatic atrophy (e.g.

Leech et al. 2009, see Chapter 7), defined as shrinkage of the construction's paradigmatic potential.

Furthermore, it seems that no construction could disappear without any cause. The present work shows that even though in theory "everything in language can become obsolete" (Haspelmath 2004: 33) indeed, in practice only constructions which are or which (more or less suddenly) turn out to be "against" higher-order process(es) at work at a certain point in time, do become obsolescent and obsolete. The findings from the network of English subordinators of purpose show that chances of becoming obsolescent grow if a construction in question is not "in line" with one higher-order process (e.g. *in order to* and *so as to*) and they rise even more significantly if there are two such higher-order processes identified (e.g. *in order that, so that* and *lest*), see Chapter 8 (e.g. see Sections 8.1.4 and 8.2.2).

These higher-order-related findings should be mentioned again with reference to observations Hopper & Traugott (2003: 172) make, namely that i) "the whole paradigm can pass out of general use"; ii) the older paradigm remains in written and formal registers, but is essentially dead in the colloquial registers; iii) in cases like that "renewal" (replacement of a dying form by a newer one) is common. Even though none of these statements seems to be false when juxtaposed to the findings of this work, what is essential to make them more useful in practical analyses of processes of obsolescence is some principled guidance on the crucial question of why in certain instances of attested historical change "the whole paradigm passes out of general use" and speakers replace it with what they obviously must regard as a better constructional alternative. The addition proposed by the present work, with regard to the former question, is that a whole paradigm might pass out of general use if it turns out to be not "in line" with the higher-order processes and changes accompanying them. To the latter question, our suggestion would be that the newer form is, in most of the cases, "in line" with at least one higher-order process operating during this certain time period in question and exactly this makes it "better". So "better" is to be defined here as "more adjusted to the dominating trends shaping the language at a certain moment".

As for ii), namely that the older paradigm remains in written and formal registers, there might be at least two possible explanations, which are interrelated. The first part is that the more formal genres and registers are often most conservative, so the changes starting in registers which are more "alive" or "every-day" do not make it to the formal genres so quickly, thus there most usually is a significant degree of delay. An example

could be the genre of *non-fiction*, which has been shown to have longest sentences in terms of words, see Section 8.1.3, and which, by its nature, is probably the last genre to have shown signs of e.g. colloquialisation. The second part is that the mental grammar, by organising itself anew and adjusting to various changes, puts these constructions into the more conservative genres because this is where they seem to fit most, a situation which might look as if the archaic constructions were searching for shelter in texts appearing to be the "older version" of language. Some of these constructions might really find a new functional niche (see e.g. *in order to*, Section 8.1.3 and 9.1.1) and this could allow them to function in the language for some more decades or even centuries. Other ones might just stick around for some more time while gradually fading away, a process which might be short or very long, and which might lead to some items becoming more of a "nonaptation" (Lass 1990: 100, see Section 1.5):

> Nonaptations persist because there is no particular problem in keeping them, and there may even be 'work' to do in getting rid of them. If these nonaptations or adaptations fallen into desuetude can be later exapted for something else, well and good; but there is no particular reason ever either to do this or not to.

Whether nonaptations prefer more formal genres and registers is not clear. But a presence of such correlation does seem logical, also given the writing conventions of non-fiction genres and the practice of including quotations and making references to older sources.

A somewhat controversial finding of the present work is that the role played by higher-order processes (Chapter 8), as a potential cause for obsolescence, is so important that it almost completely overshadows competition on the constructional level. If grammatical obsolescence would have to be described and discussed only on the basis of this work, one of the conclusions would be that competition on the constructional level is to be subsumed as a "touchable" result of changes happening at all the higher levels in the language and, in some cases, in the society. In other words, one could say that the constructions as such do not compete with each other, but what we observe on the constructional level is a symptom of higher levels undergoing a change, be it an internally- or externally-motivated change, and the constructional level is never separable from the higher-order processes.

Thus, given the fact that in line with what Hilpert (2013: 14) says, changes in which "a higher level of grammatical organisation than the construction is concerned do

not constitute constructional change", according to the present work, obsolescence could instantiate constructional change only if we looked at it in a complete separation from the higher-order processes standing behind it. Then, if we decided to not look any higher and to only focus on the constructional level itself, what we would see could be classified as constructional change, namely a change which "selectively seizes a conventionalised form-meaning pair of language, altering it in terms of its form, its function, any aspect of its frequency, its distribution in the linguistic community, or any combination of these" (Hilpert 2013: 16).

Another topic which needs to be discussed with regard to obsolescence is the frequency of use of a construction. According to the present work it is not only a variable that has to be measured to check for the presence of negative correlation between the time and the frequency of use (which in itself is the necessary condition for obsolescence), or to compare the popularity of different constructions at different points in time. The findings from the network of English purpose subordinators show that the frequency of use might even be a good prognostic of the construction's future, as it does seem to play a certain role in making constructions more or less prone to obsolescence.

The results obtained in the case of *in order to*, which might be changing its function from an every-day subordinator of purpose to a more elaborate marker of style (see Section 9-2), or *so as to*, which might also be seen as "fighting" to stay around for longer by shifting its paradigmatic potential (see Section 9.2) can mean that those of the constructions which used to have considerable frequency and popularity before they, more or less suddenly, turned out to be not "in line" with higher-order processes and the trends accompanying them, have more options to stay in the language for longer and, possibly, get exapted or regrammaticalised (Lass 1990, Greenberg 1991).

Also fossilisation is a process which appears to favour a construction which has a long history and which used to have some popularity, namely *lest*, which is the oldest one of the five case studies (López-Couso 2007: 14, see Section 3.2.5). In Section 5.5.4 *Lest* is shown to be forming an idiomatised, fixed and possibly fossilised expression – *lest we forget*. The pre-decrease frequency of use does seem to play an important role, as e.g. *in order that*, a subordinator of purpose which has never been very frequent and which is a lot younger than *lest*, does not show any signs of possibly being exapted or becoming part of an idiom or a fossil.

Thus, the correlation regarding the frequency of use is the following: the more frequent an item is before it starts to lose its frequency of use, the longer it will stay in the

language and the higher the chances are that it will either change its functional niche (e.g. *in order to*) or form a fossil (e.g. *lest we forget*).

The history of *in order that* (Sections 3.2.2 and 9.1.2), which, from its beginning does not seem to be very "in line" with higher-order processes and, as previously mentioned, does not reach very high frequency of use, might actually be an instantiation of marginalisation (Hansen 2017: 264, see Section 1.2 and 9.1.2), a process which, contrary to grammaticalisation, does not give rise to the formation of fully-fledged grams but to elements which are occupying a peripheral position in the language system. Assuming *in order that* is indeed a result of marginalisation, we might supplement the description of marginalisation by adding a suggestion that more often than not, the "products" of marginalisation could share one characteristics which makes them "just" products of marginalisation, namely as constructions they are not "in line" with the higher-order processes operating at the time around their creation and "early life".

Thus, with regard to marginalisation and grammaticalisation, and the differences between them, one could say that the cliché "to be in the wrong place at the wrong time" is also true for constructions, as for every construction the point in time at which it comes to existence might either be right or wrong. Of course one could also formulate it the other way round and hypothesize that since the higher-order phenomena and associated language change processes shape the constructional layer of the language, everything that is created should be "in line" with at least one higher-order process or accompanying trend. This could, at least to some extent, be true if we only had internally-motivated changes and higher-order processes in language, and if these processes always proceeded at the same rate. This, however, does not seem to be the case, as e.g. the boom of mass literacy and the technological changes of the nineteenth century came from "outside" of the language and the pre-warnings might not have been suitable given the size of changes which were brought about.

Coming back to "being in the wrong place at the wrong time", from the theoretical point of view, there is a possibility that some of the constructions which have become obsolescent or obsolete would at least stick around in the language for longer, if they were "born" at a different point in time and not e.g. just before a higher-order process "kicked in" with which they were completely not "in line". Hypothetically, it is still possible that after some time a new higher-order process could come about, one with which the construction in question would be "in line" again. If the construction happened to survive in the language during the times of being "in disgrace", it could become fully

functional again or at least get exapted in the meantime. But this, as has been suggested above, seems to depend on the frequency of use reached by a construction before it started to decrease, which in turn might be viewed as depending on the higher-order processes at work around the time of its creation.

Still, the game is not over yet. Probably most of these constructions will stick around for a few more decades and some of them adjust their function to the new conditions or prolong their existence as parts of idioms or fossils.

Some will indeed disappear from active use and stay on the pages or in the files of what the future will refer to as "older sources". Before they really disappear they will hang around as "nonaptations" (Lass 1990) and, from time to time, make "guest appearances", a situation described by Hundt (2014: 185) as "occasional use of the "dead" construction well beyond the period when it should, in theory, have become ungrammatical". Some of our case studies might actually change their main place of residency to other Englishes, as the comparative corpora of different varieties of English show that what is obsolescent in American English, sometimes still seems to be doing fine in some of the other World Englishes (Rudnicka 2015, slide 20).

9.4 Outlook

In the research literature, grammatical obsolescence has occassionally been referred to as an under-researched phenomenon (e.g. Hundt 2014). This book has aimed to close this gap by offering a comprehensive study addressing the problem from both a theoretical and practical perspective, and to add a counterweight to the relatively well-researched phenomena of innovation and emergence in grammar.

Focused on a process which is not in the research "mainstream" yet, the theoretical and methodological approaches developed by this work have been designed to serve as a model for other studies dealing with the "negative end" of change, be it in grammar or lexis. Some of the methods presented here, for example calculation methods based on extrapolated frequencies of use (Section 6.2.1) or the estimation of the number of purposive *to*-infinitives across decades (Section 5.2.1) are designed especially to detect tendencies in the data no matter how much or how little data we have and how uneven the balance of genres is in a corpus.

Apart from focusing on obsolescence, but still on the methodological side, I would also like to point to the internally- and externally-motivated higher-order processes,

which are distinguished by the present work in an attempt to order different changes, processes and trends manifesting themselves on various levels (e.g. Section 8.3). The hierarchical schemas (See Figs. 8-5 and 8-8) illustrating these processes might as well be tested and used to order and analyse other kinds of change, not necessarily related to obsolescence.

The developments investigated by this work all turned out to result, above all, from higher-order processes. They all represent what we could call "obsolescence of form" and not function, as their function is still part of the language, only that it is expressed with different means. However, this certainly does not mean there is no "obsolescence of function" in grammar. The criteria catalogue proposed here also includes questions and suggestions hinting at whether what we see concerns just the form or both form and function. Research focused on construction(s), which would represent loss of form and function could be a very interesting next step to the investigation of obsolescence, its causes and symptoms.

Since the present work is limited to written American English, there still is a lot of room for research in other varieties of English. As has been mentioned in Section. 9.3, exploratory searches done in GloWbE[54] show that some of the constructions which seem to be on the way out in the core L1 varieties appear to still be doing more or less fine in some of the World Englishes (Rudnicka 2015, slide 20). Even a comprehensive comparison between British and American English could also lead to interesting results.

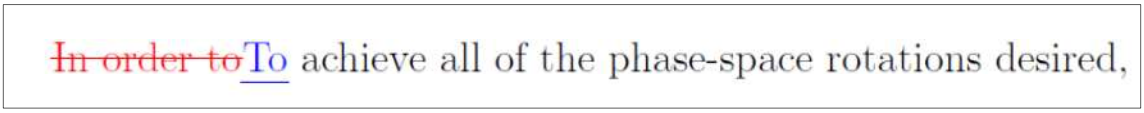
Another development which is definitely interesting to watch is how the changes of the 21st century, such as the growing importance of smartphones and mobile devices in the media landscape (see Section 8.1.5) could affect the syntactic usage. How much can written sentences "shrink" in their length?

Furthermore, a great opportunity to do research is offered by the use of a cross-linguistic perspective to obsolescence or to higher-order processes themselves. Even though the one internally-motivated higher-order process investigated by this work, namely the rise of the *to*-infinitive, might not be at work in other languages, the socio-cultural changes of the 19th century did affect most of the countries of the developed world and the changes brought about by them and with them are possibly influencing the constructional level of various languages. As mentioned in 8.1.1, Gross et al. 2002, detect a visible shrinking in the average sentence length in scientific prose written in English,

[54] The corpus of Global Web-based English, available at https://corpus.byu.edu/glowbe/.

German and French, so it seems very likely that also cross-linguistically some of the outcomes of the higher-order processes might lead to similar results.

Seen in such a wide perspective, this study of obsolescence makes a contribution to our understanding of more general diachronic developments such as colloqualisation (Mair 1998) and informalisation of the language of the media (e.g. Leech et al. 2009). Sociocultural changes often affect different speech communities in similar ways. Nevertheless, the way these changes are reflected in the grammar is conditioned by the constructional network of a given language in a given period of its development in history. In that sense, my analysis has explained why the editor of an American scholarly journal in the natural sciences has suggested the following stylistic improvement[55] to a paper written by an international team including a native-speaking author who, among other duties, has also been responsible for the grammar and style of the draft (Paul et al. 2018: 052113):



[55] Personal communication with authors of the manuscript published in Physical Review A.

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Language Corpora

B-BROWN The B-Brown-1931 Corpus (BBROWN). Compiled by Marianne Hundt.

BLOB-1931 The BLOB-1931 Corpus (BLOB). Compiled by Geoffrey Leech, Paul Rayson and Nick Smith.

BROWN A Standard Corpus of Present-Day Edited American English, for use with Digital Computers 1964, 1971, 1979. Compiled by W. N. Francis and H. Kučera.

Davies, Mark. (2008-) The Corpus of Contemporary American English (COCA): 560 million words, 1990-present. Available online at https://corpus.byu.edu/coca/.

Davies, Mark. (2010-) The Corpus of Historical American English (COHA): 400 million words, 1810-2009. Available online at https://corpus.byu.edu/coha/.

Davies, Mark. (2013) Corpus of News on the Web (NOW): 3+ billion words from 20 countries, updated every day. Available online at https://corpus.byu.edu/now/.

FLOB The Freiburg-LOB Corpus ('F-LOB') (original version) compiled by Christian Mair.

FROWN The Freiburg-Brown Corpus ('Frown') (original version) compiled by Christian Mair.

LOB The LOB Corpus, original version (1970–1978), compiled by Geoffrey Leech, Stig Johansson and Knut Hofland.

Zusammenfassung in deutscher Sprache

Dieses Buch handelt von grammatikalischer Obsoleszenz, einem Prozess in dessen Verlauf grammatische Konstruktionen, die man früher als häufig, populär und produktiv bezeichnen konnte, zunehmend selten und unüblich werden. Im Endstadium der Obsoleszenz können die betroffenen Konstruktionen völlig aus dem Gebrauch verschwinden oder Fossile und Überbleibsel formen.

Grammatikalische Obsoleszenz ist, im Gegensatz zu Prozessen der Emergenz und Innovation, eher wenig erforscht. Das Hauptziel dieses Buches besteht darin, diese Lücke mittels einer umfassenden Studie, die die Obsoleszenz sowohl in theoretischer als auch in praktischer Hinsicht untersucht, zumindest teilweise zu schließen.

Die Struktur dieses Buches hängt mit seinem Hauptziel zusammen und hat neun unterschiedliche, aber miteinander verknüpfte theoretische und praktische Komponenten. Es gibt einen theoretischen Teil am Anfang (Kapitel 1-3), einen praktischen Teil in der Mitte (Kapitel 4-8) und wiederum einen theoretischen Teil am Ende, der die Ergebnisse des praktischen Teils mit ihren Implikationen zusammenführt und die Schlussfolgerungen präsentiert (Kapitel 9). Dieses Design ermöglicht es dem Leser, das Buch nicht nur von Anfang bis Ende zu lesen, sondern sich beispielsweise auch auf die theoretische Ebene zu konzentrieren und von Kapitel 1-3 direkt zu Kapitel 9 überzugehen. Auf die praktischen Teile kann bei Bedarf jederzeit zurückgegriffen werden.

Die Untersuchungsobjekte des praktischen Teils sind fünf englische finale Satzverbindungen (*purpose subordinators*), nämlich *in ordert to*, *in ordert that*, *in order for * to*, *so as to* und *lest*. Anhand der Ergebnisse zieht diese Dissertation folgende drei Schlussfolgerungen: i) keine Konstruktion, die sich in der Sprache etabliert, kann „aus heiterem Himmel" veralten oder verschwinden; ii) es gibt immer einige „Vorwarnungen", z.B. Verteilungsfragmentierung - eine zunehmende Einschränkung von Konstruktionen auf bestimmte Genres und fachliche Register (z. B. Hundt & Leech 2012; siehe Kapitel 6); iii) Die Konstruktionen, die sich als „widersprüchlich" zu den Prozessen der höheren Ordnung (*higher-order processes*, siehe Kapitel 8) erweisen, werden mit höherer Wahrscheinlichkeit obsoleszent.

Unter sogenannten Prozessen der höheren Ordnung werden Veränderungen verstanden, die oberhalb der Konstruktionsebene stattfinden. Solche Änderungen betreffen die „höhere grammatische Ebene als die Konstruktion" (Hilpert 2013: 14). Dieses Buch unterscheidet zwei Arten von Prozessen der höheren Ordnung – intern oder extern motivierte Prozesse (siehe Kapitel 8). Der hier beschriebene intern motivierte Prozess ist der Aufstieg des *to*-Infinitivs in der englischen Sprache. Der extern motivierte Prozess wird als die soziokulturelle Veränderung des 19. Jahrhunderts bezeichnet.

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The present book deals with the phenomenon of grammatical obsolescence – a notion covering cases in which a productive grammatical construction starts displaying a decrease in frequency, possibly coinciding with restrictions in functional range. Ultimately, this decrease in frequency will lead to the total loss of the construction, or to its survival in the form of fossilized residues. Contrary to processes of emergence and innovation, the topic of grammatical obsolescence has remained under-researched. It is the aim of this study to redress this imbalance, by providing a comprehensive theoretical discussion of grammatical obsolescence, followed by an empirical test case. The variable selected for this case study is purpose subordination in English from ca. 1800 to the present, in particular the variants *in order that*, *in order to*, *in order for * to*, *so as to* and *lest*. Methodologically, the study combines philological analysis with a range of state-of-the-art statistical approaches, applied to data obtained from large machine-readable corpora.

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