Modality, usage and diachrony

Constructional changes in the modal domain in American English

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Acknowledgements

Preface

The bulk of the present dissertation is based on a collection of the author accepted manuscripts of research articles (presented in Chapters 3–6) that have already been published in internationally peer-reviewed publishers. Given the different formatting standards, style guidelines, and referencing styles of these publishers, the articles have been standardized to a common format in order to increase this manuscript's readability — this includes a common referencing style and linguistic conventions according to the LSA's *Unified Style Sheet*, adjusted formatting for figures and tables, changed color schemes, and consecutive numbering. The general contents and the results remain unaltered and are presented here as in the original publications. References are provided along with every article and readers are asked to refer to the published versions of record for quoting. The respective publishers should be contacted for permission to re-use or reprint the materials in any form. Chapters 1, 2 and 7 have not been published anywhere or submitted to any publisher. Note that the order in which the articles are presented in this manuscript is not chronological, that is, it is not based on their publication dates. Rather they have been arranged to form a conceptually more coherent narrative thread.

1   Introduction

English modal expressions constitute a highly complex system in flux that, with the increasing number of and access to diachronic corpora, has been subject to extensive linguistic scrutiny over the past two decades. Particularly the research output on the diachrony of modal verbs (e.g. *can*, *must*, *may*) and semi-modals (e.g. BE *going to*, HAVE *got to*, WANT *to*), as the principal means of conveying modality in English, has brought forth important insights on how their respective developments unfold across different time periods, varieties, and registers, and to which of their properties (e.g. FORM, SEMANTICS, PRAGMATICS, FREQUENCY OF USE) any changes pertain. Furthermore, a fair amount of language-internal and language-external explanatory factors have been proposed to account for the modal system's dynamicity. To set itself off from the previous research, the present work approaches the modal system from a variety of perspectives that are informed by different frameworks, namely (diachronic) corpus linguistics, Construction Grammar, and dynamic, usage-based models of language. Taken individually, it is suspected that no account will be fully sufficient to describe and explain the heterogeneity within the modal domain; in combination however, they can yield converging evidence that essentially helps address the nature of the changes the modals and semi-modals underwent in American English (AmE) from the early 19th century onwards.

1.1   Central claims

That the modal system in AmE continues to be in a process of reorganizing has been widely accepted for quite some time (Bolinger 1980; Givón 1993; Hundt 1997; Mair 1997; Myhill 1995; to name a few); yet, the exact nature of this process, that is, its directions, magnitude, or the elements affected, remains subject to debate.[1] Considerable attention has been paid to frequency shifts as an indicator of the modal system's rearrangement and several linguists agree that modal verbs (as a group) appear to be

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[1] Changes in the modal system are, in fact, not limited to AmE, but have also been observed in other varieties of English (see e.g. Biewer et al. 2020; Close & Aarts 2010; Diaconu 2012; Dollinger 2008; Hansen 2017, 2018; Noël, van Rooy & van der Auwera 2014 and references therein; Seggewiß 2012; Smith 2003; Smith & Leech 2013; Tagliamonte & D'Arcy 2007).

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declining in their frequency of use, while semi-modals seem to become more prominent (Biber 2004; Jäger 2020; Jankowski 2004; Krug 2000; Leech 2003, 2011, 2013; Leech et al. 2009; Leech & Smith 2006, 2009; Lorenz 2013a; Mair & Leech 2006; inter alia). These observations, however, specifically the overall demise of modal verbs, do not go entirely unchallenged, as previous studies have provided evidence that their development may be quite sensitive to genre (Millar 2009) and perhaps only a more recent phenomenon (Mair 2015).

Crucially, regardless of any proclaimed general trend in the use of modal verbs or semi-modals (or other modal expressions), individual developments often do not coincide, and even if they do, they can progress at different rates, which raises doubts whether a unified treatment is even appropriate. To illustrate, consider the diachronic frequency shifts in the use of the modal verbs *can*, *could*, *may*, and *shall* in the *Corpus of Historical American English* (COHA; Davies 2010) shown in Figure 1.1 (cf. also Sections 3.5 and 6.4).
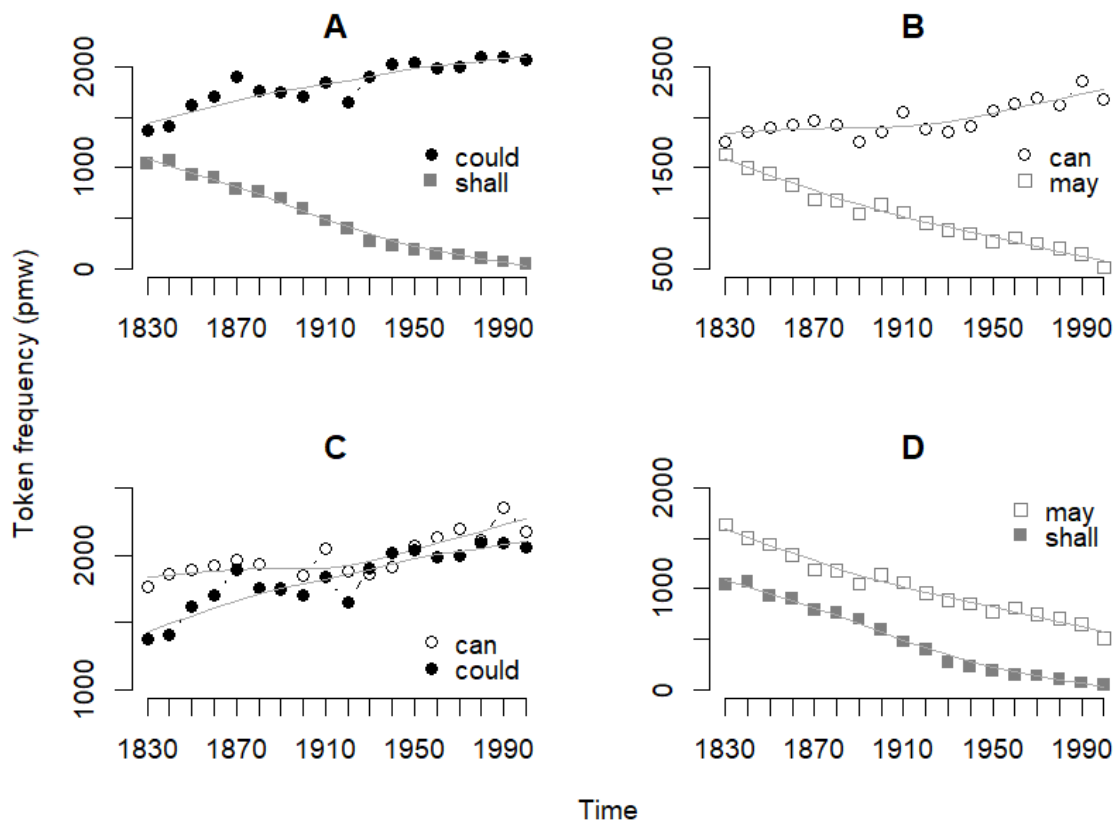
Figure 1.1. Divergence and apparent homogeneity in the development of selected modal verbs; COHA, 1830–2009; trends are indicated by lowess curves (grey solid lines)

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Plot A clearly indicates that *could* and *shall* are on completely different paths in terms of changes in their token frequency (per million words). They also do not exhibit any discernable functional overlap, as *shall* is typically used to convey either '(strong) obligation', 'volition', or 'prediction', whereas *could* usually indicates 'ability', 'permission', 'epistemic possibility' or is used in hypothetical contexts (see e.g. Coates 1983: 5; Collins 2009: 97–104, 135–138). On what grounds then can we argue that conflating their divergent developments, while glossing over their distinct functional preferences, is justified?

The story is different for *can* and *may* in plot B. Even though their respective developments clearly diverge as well, they stand in potential paradigmatic competition in contexts related to 'permission' or 'root/event possibility' (Depraetere & Reed 2006: 275; Leech et al. 2009: 84–85); compare the examples in (1).

(1) a. It was more than a little freaky. "**Can** I ask you a question?" I said, interrupting his recitation in tenth grade. [COHA, SecretSocietyGirl, 2006]

a'. Russell left the keys on the television and faced Daniel. "**May** I ask you another question?" [COHA, FantasySciFi, 2006]

'permission'

b. Since people are typically rational, it therefore typically limits the practical preferences a person will have. Consequently, a person's nonpractical preferences **can** be identified through her practical preferences. [COHA, EthicsOutEconomics, 1999]

b'. Their outside involvement may have different, more personalized patterns from those of younger people. # These patterns **may** be identified through peer sampling, that is, identifying and sampling how a peer group carries out its interests. [COHA, Re:View, 1996]

'(non-deontic) root/event possibility'

That is not to say that the uses of *can* and *may* are fully equivalent, considering that the linguistic choice between them may very well be influenced by the different pragmatic associations they evoke (cf. Schmid 2020: 282–283); for example, the association of *may* with 'politeness' or more formal registers. Nonetheless, the two modals are functionally more similar than *could* and *shall*. Juxtaposing their diachronic developments seems therefore plausible, as the decline of *may* appears to be, at least in part, due to *can* taking over some of its functions. However, aggregating their respective frequency counts would

still seem conceptually odd, at least if the goal is to report on a more global trend in the modal system.

The lower panels of Figure 1.1 plot the four modal verbs based on apparently matching trends; the lowess curves in plot C point to increases in the respective usage frequencies of *can* and *could*, whereas plot D shows nearly perfect decreases in the usage frequencies of *may* and *shall*.[2] While the developments within the latter pair tie in well with the more general decline in the use of modal verbs regarded as a group, it is clear that *can* and *could* do not 'follow protocol', which substantiates the impression that averaging across the entire category MODAL VERBS is controversial. Apart from that, the apparent similarities in the respective in- and decreases in frequency across time certainly invite speculations about a common cause that would explain why the developments of the modal verbs within each pair seem to line up. For *can* and *could*, it is quite conceivable that they compete strongly for selection to encode notions of 'possibility'. The same reasoning regarding any functional similarity cannot be applied in the case of *may* and *shall*, but perhaps it is their common pragmatic associations with formal writing that plays a role, assuming there is a tendency for written registers to become less formal (cf. Biber 2003; Leech et al. 2009; Westin 2002).

Interestingly, however, the changes the modal verbs in each pair underwent are not as similar as we are led to believe. Concerns have recently been voiced that a correlation between two variables through time can be spurious if levels instead of changes are considered (Koplenig & Müller-Spitzer 2016; Hilpert 2020). By correlating the differences in frequencies between adjacent periods rather than the absolute values for the respective modal verbs in each pair, it can be shown that, in terms of magnitude and direction, the changes are not mutually related statistically speaking — for *may* and *shall* even less so than for *can* and *could*; see the scatterplots in Figure 1.2. Even though the two modals from each pair might share the same general trends, namely overall increases and decreases respectively, the deviation of the individual data points (black triangles) from the regression lines indicates that these trends differ in their profiles, meaning that the peaks and troughs of the developments do not line up neatly (cf. also Figure A1 in the Appendix). While it is perfectly imaginable that a common cause may have some delayed effects on one of the variables, it is also just as possible that the developments are simply

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[2] The trends were assessed statistically using Kendall's Tau (r_τ) (for more details, see Hilpert & Gries 2009; cf. also Sections 4.3.3, 5.4.1 and 6.4). The tests for correlation yielded strong, significant increases and decreases respectively (*can*: r_τ=.58, p=.0004; *could*: r_τ=.73, p<.0001; *may*: r_τ=-.96, p<.0001; *shall*: r_τ=-.99, p<.0001).

unrelated even beyond statistical testing. What complicates the issue even further is that the trends conflate distributional information pertaining to genre, the different senses associated with the modal verbs (e.g. 'possibility', 'obligation') as well as their different syntactic configurations (e.g. NEGATION, INVERSION). To what degree this influences the results remains to be seen, but in any case, the data suggest remaining cautious about any overall development of modal verbs.
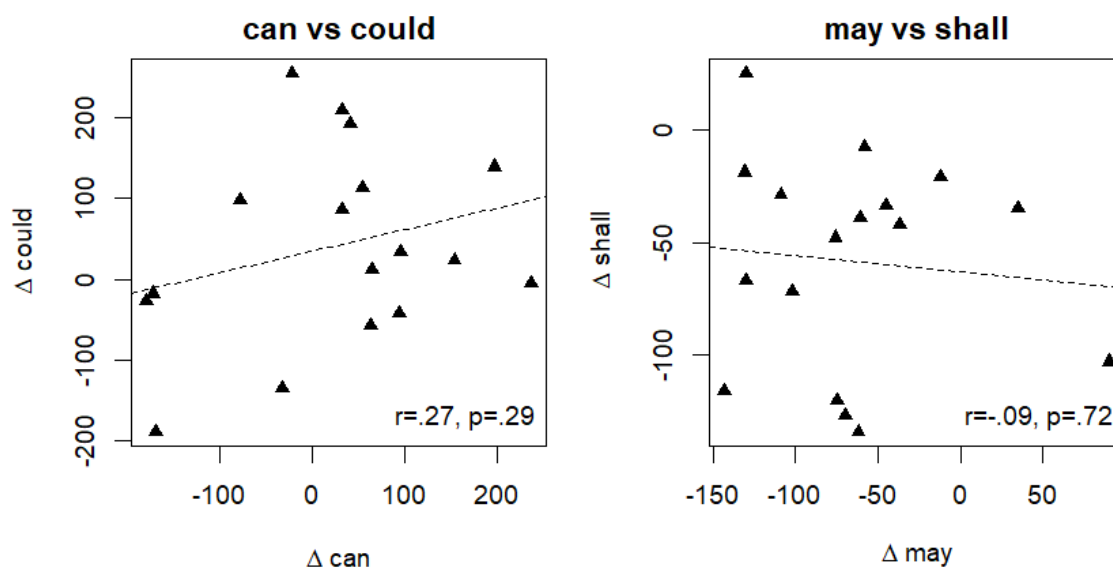
Figure 1.2. Correlation of decadal changes in the usage frequency of different modal verbs; summaries of the data are provided by linear models (dashed regression lines); correlations are assessed using Pearson's *r*

In sum, these observations give rise to the suspicion that the modal system might have been undergoing much more complex, diverse changes than advertised in previous studies and that a more descriptive and informative approximation thereof requires to not only zoom in on individual trends of modal expressions but to also reassess common conceptions about how to approach modal categories from a diachronic perspective both conceptually and methodologically. The present work claims that one way to achieve this is by coupling corpus-based with usage-based approaches.

To elaborate, historical data are largely inaccessible to intuition (Hilpert 2013a: 107; McEnery et al. 2006: 96), most certainly any aspects related to *usage intensity* (e.g. text frequencies, collocational preferences, distributional changes), which means that real-time studies of language change have to rely heavily on corpus data and, in many cases,

on quantitative methods.[3] (Lexico-)grammatical phenomena, such as modal expressions and their development over time, are obviously no exception to this. While the empirical contribution of such data feed into the descriptive component of a diachronic study, usage-based frameworks, such as Cognitive Construction Grammar (Goldberg, 1995, 2006; Langacker 1987, 1991; inter alia), Diachronic Construction Grammar (Hilpert 2013a; Traugott & Trousdale 2013), exemplar-based models (Bybee 1998, 2002a, 2010; Pierrehumbert 2001; inter alia), or dynamic, network-oriented models (Diessel 2019; Goldberg 2019; Schmid 2020) may provide the necessary explanatory power for obtaining more informative results. This is accomplished by assigning a key role to usage intensity for operationalizing (i) the mental storage and processing of linguistic units, (ii) the emergence of linguistic structures, (iii) changes in linguistic representations, and (iv) the diffusion of words or patterns in the speech community. In more technical terms, different frequencies can be used to approximate the *entrenchment* of utterance types (e.g. single words, multiword expressions, syntactic structures) as patterns of associations on the level of the individual speaker and their *conventionalization* on the collective level (cf. Blumenthal-Dramé 2012; Schmid 2015, 2018a, 2020; Stefanowitsch & Flach 2017).[4] And if, among other things, frequencies are considered an explanatory factor of linguistic behavior, while corpora, at the same time, provide distributional data in form of raw frequencies, from which more complex measures can be derived, it follows that corpus-linguistics and usage-based linguistics naturally form a liaison (see also Gries 2010, 2017). Accordingly, existing corpus data can be measured against the assumptions laid out by the frameworks mentioned above. In turn, these frameworks can obviously inform any conceptually motivated decisions on part of the researcher about which data need to be retrieved from a corpus in order to obtain more refined results.

Based on these conjectures, it will be argued that the observations regarding any general trends in the changing use of modal verbs and semi-modals as indicators of the restructuring of the modal system in AmE, although discernable, may lack conceptual and methodological precision. This work's proposal thus is that the descriptive accuracy of how developments in the modal domain have proceeded over the course of the 19th and 20th century can be increased substantially if the following claims stand up to testing.

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[3] The term *usage intensity* is adopted from Stefanowitsch & Flach (2017) and represents a cover term for different conceptualizations of frequency of use.

[4] Both *entrenchment* and *conventionalization* will be discussed in more detail in Section 2.3.

First, changes in the modal system are primarily constructional in nature, which is understood here in terms of Hilpert's (2013a) formulation:

> Constructional change selectively seizes a conventionalized form-meaning pair of a 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 2013a: 16)

What makes this conception particularly intriguing is not only its compatibility with corpus linguistics and different cognitive-functional frameworks (cf. Section 2.2). It is specifically the tenet that constructional changes operate selectively rather than systemically, which shifts the focus away from global to individual developments. This is a welcome approach, given that changes in the modal domain are neither unidirectional nor do they manifest at the same rates nor are they alike in terms of quality for all modal expressions. While this heterogeneity can be expected, given the different categories available to convey modality (e.g. MODAL VERBS, SEMI-MODALS, MODAL ADVERBS, SUBJUNCTIVES, other lexical expressions of modality), it is also suggested here that this is due to the categories themselves being inherently gradient. Even a seemingly clearly demarcated category, such as MODAL VERBS, exhibits internal multifunctionality and distinct distributional preferences among its members and the present work proposes that these properties should not be outweighed by the modals' morphosyntactic coherence only to promote a unified treatment.

Second, in addition to formal and functional properties, (relative) frequency shifts and usage-profiles of modal expressions may serve as historical signposts for their categorial status or lack thereof. Utterance types that are perceived as similar by naïve speakers may also develop similarly in terms of direction and magnitude. As a consequence, distributional data should factor in when grouping modal expressions into more coherent sub-classes. By contrast, divergent trends should not simply be aggregated, albeit some possible overlap in the form or function of the modal expressions under consideration. For one thing, aggregated frequencies are simply less precise in general, but crucially, they are misleading if the aggregated trend does not describe the individual trends well; compare the developments in Figure 1.1. Also, if different kinds of frequencies are conceived of as an explanatory force, differences in the distributional properties of modal expressions point not only to differences in their degree of conventionalization in the speech community but also (indirectly) to possible differences

in their linguistic representation in the minds of speakers (Blumenthal-Dramé 2012; Hilpert 2013a: 17; Mukherjee 2004, 2005: passim; Schmid 2000, 2010, 2020; Stefanowitsch & Flach 2017; inter alia).

Third, paradigmatic competition operates across the established modal categories as well as within, all the way down to the alternation between contractions and full forms. For example, modal verbs do not only compete for selection with the semi-modals (e.g. *must* vs HAVE *to* vs NEED *to*, *will* vs BE *going to*, *can* vs BE *able to*) or amongst themselves (e.g. *can* vs *may*, *may* vs *might*); they also do so with their contracted forms (e.g. *would* vs *'d*, *will not* vs *won't*).[5] Especially the latter will receive detailed attention. It will be shown that the modal enclitics (*'d*, *'ll*) as well as some of the negative modal contractions (e.g. *can't*, *won't*) have emancipated themselves from their respective full forms in terms of their distribution and function and thus deserve to be treated independently (cf. also Bybee 2010; Nesselhauf 2014). Similar observations have been made for contracted semi-modals, such as *gonna*, *wanna*, and *gotta* (e.g. Krug 2000; Lorenz 2013a, 2013b, 2013c), and it has been proposed that these contractions do not simply represent pronunciation variants but distinct lexical entries in the minds of speakers (e.g. Lorenz & Tizón-Couto 2017; Schmidtke 2009). Assuming the same applies to the enclitics and at least some of the negative modal contractions, an analysis of the developments in the modal system requires disentangling the changes that pertain to the full forms and the contractions respectively in order to maintain descriptive accuracy regarding the dynamic nature of the category MODAL VERBS.

Fourth, the *distributional hypothesis* is of particular importance in diachronic linguistics and thus for studying changes in the modal domain. The notion that distributional data provide valuable insights on the meaning and function of linguistic utterances has been firmly established in quantitative (corpus) linguistics for decades (cf. Firth 1957: 11; Harris 1970: 785–786). Proponents of usage-based linguistics capitalize on this assumption and argue that speakers act as intuitive statisticians that have probabilistic knowledge of the distributional properties of language (e.g. Diessel 2007; Ellis 2006; Taylor 2012). Assessing these properties through introspection is hardly possible for present-day English but downright impossible from diachronic data. To illustrate, eliciting any semantic (or functional) differences between *He will not find her*

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[5] The examples provided here represent cases of onomasiological paradigmatic competition. Since the different senses associated with a given modal verb probably compete against each other for selection as well, we can also assume semasiological paradigmatic competition to be at work; see Schmid (2020) for a more detailed discussion.

and *He won't find her* from a speaker of present-day English will likely fail. Quantitative corpus analysis, on the other hand, shows that *find* is more strongly associated with *won't* than *will not*, that is, it occurs more often with *won't* than would be expected by chance (cf. Section 4.3.4). It also shows that this preference was less pronounced in the 19th than in the 20th century, which can safely be claimed not to be part of the linguistic knowledge of present-day English speakers. What the present work assumes to be part of their tacit knowledge, however, is that, given the differences in the syntagmatic associations that *won't* and *will not* entertain with their following verb infinitives, *won't* V and *will not* V may trigger (slightly) different symbolic associations (cf. Schmid 2020: 266). If such distributional skews can provide a researcher with access points to 'hidden' semantic structures, the contribution of quantitative corpus analyses to diachronic linguistics and the cognitive-functional enterprise goes way beyond reporting (changes in) overall text frequency (cf. Gries 2020).

1.2   Scope of the present analysis

The previous section has already alluded to the complexity of the English modal system. Investigating changes within thus inevitably requires imposing two restrictions to keep this endeavor focused and manageable. A disclaimer is still in order because these restrictions can cause somewhat of a paradox that takes effect particularly when adopting a cognitive-functional, usage-based perspective. This will be outlined in the following.

First, this work focusses on modal verbs and semi-modals exclusively. Given that modality can be expressed by other (non-verbal) means as well, this restriction entails that any claims of completeness regarding the changes in the modal domain must be discarded. Other categories will be mentioned in passing but will not receive any detailed attention. While this practice is not uncommon, it is important to remember that usage-based approaches conceive of linguistic knowledge as a highly complex, dynamic network of associations. In such a network, modal verbs and semi-modals represent but subsets of potential contenders for the encoding of an idea. This is illustrated by the invented examples in (2) and (3).

(2)   a.   We **must** address this problem.   MODAL VERB
      b.   We **have to**/**need to**/**have got to** address this problem.   SEMI-MODAL

| | c. | It's **imperative** (that) we address this problem. | ADJECTIVE |

…

(3)	a.	They **could/may/might** be innocent.	MODAL VERB
	b.	**Perhaps/Maybe** they're innocent.	MODAL ADVERB
	c.	It's **possible** (that) they're innocent.	ADJECTIVE
	d.	There's a **possibility** (that) they're innocent.	NOUN

…

The respective lists are far from complete and while it is not claimed here that the utterances within each set are semantically identical and therefore generally fully interchangeable, they do encode more or less the same types of experience, namely 'obligation' in (2) and 'possible situation' in (3), through different means.[6] Since speakers are assumed to not only generalize over similar forms but also meanings, selecting one of these patterns over the others will affect the paradigmatic associations between all of them.[7] As a consequence, if we single out one or two categories for linguistic scrutiny, the results should be treated with some caution, since they will probably paint an incomplete (and potentially spurious) picture of the changes within the modal domain. The present study is painfully aware of that problem, which has, in fact, led to the decision to pay closer attention to changes within the categories first in order to obtain a more accurate approximation. In sum, the findings should still cover considerable ground with regards to the changes in the modal domain. After all, the modals and semi-modals represent the main means of conveying modality in English.

Second, usage-based linguistics emphasizes that diachronic change and synchronic variation represent an integrated whole that is best viewed through the same lens (Bybee 2010; Diessel 2011; Kemmer & Barlow 2000; see also the contributions in Coussé & von Mengden 2014). That is, if a researcher seeks a more comprehensive understanding of the intricacies of the modal system, they need to consider its development. The present work follows this approach but limits the analyses and discussions to the development of modal verbs and semi-modals after 1810. Clearly, this does not cover the entire history of neither the modal verbs nor the semi-modals, as they date back to Old English and the

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[6] The choice of an onomasiological variant will be contingent on probabilistic expectations which, in turn, arise from syntagmatic and pragmatic associations providing the necessary co-textual and contextual information (Schmid 2015; Schmid 2020: 304–309).

[7] Note that this does not entail that speakers form a single hierarchical macro- or hyper-construction over the instances from each set, let alone over both sets combined. The relationship may very well be captured by horizontal links in the network without recourse to a highly abstract level (cf. Section 2.2.2)

end of the Early Modern English period respectively (cf. e.g. Fischer 2007; Krug 2000; Warner 1993). However, since this study focusses on AmE, the time window selected for the present investigation is considered sufficient for providing meaningful results. And although the latest release of *A Representative Corpus of Historical English Registers* (ARCHER 3.2) provides AmE data from 1750 onwards, the present work opted for utilizing COHA (1810–2009) and the *Corpus of Contemporary American English* (COCA, Davies 2008–), for the main reason that they provide considerably more empirical data than ARCHER, which essentially enables both a data driven, bottom-up as well as a qualitative approach to uncovering changes in the modal domain.

1.3 Chapter outline

The present work is divided into three main parts. The first part, Chapter 2, builds up the theoretical background against which this study's proposals and data are measured. This is followed by four case studies presented in Chapters 3–6 that, among other things, will provide the empirical support. Chapter 7 will bring the results together and discuss the implications and contributions.

Chapter 2, *The frameworks*, sets the stage for both the conceptual argument and the empirical validation by reviewing the previous research, describing the different, converging approaches adopted in the present study, and explaining the data and methods that are utilized. Clearly, there is no shortage of studies on modality in general, and a good deal of research addressing the development of modal expressions in English. However, the case will be made that much is still to be gained from investigating the modal system from a corpus-based diachronic and cognitive-functional perspective, which is assumed not only to be descriptive but essentially informative.

Chapter 3, *On the development of modals and semi-modals in American English in the 19th and 20th centuries*, extends the previous research on the development of modals and semi-modals in AmE by providing detailed data on their overall and individual frequency shifts across time and genres in COHA. Long-standing assumptions about specific patterns of change are relativized and attention is paid to *will* and BE *going to*, as the imbalance in their respective developments points to a possible restructuring of the future tense system.

Chapter 4, *Contractions, constructions and constructional change*, hypothesizes that speakers' choice between a contracted modal and its full form (e.g. *won't* vs. *will not*) is lexically rather than morphophonologically motivated. Based on data from the fiction section in COHA, the role of contracted modals within the larger modal system is investigated and it is argued that their formal and changing functional and distributional properties point to their emancipation from their uncontracted source forms. The findings are integrated into the emerging framework of *Diachronic Construction Grammar*, according to which the development of modal contractions can be understood as a series of constructional changes.

Chapter 5, *English modal enclitic constructions*, analyzes the changes in the associative links the English modal enclitics, *'d* and *'ll*, entertain with their immediate co-text, paradigmatic competitors, and pragmatic context. It is proposed that both enclitics represent the fixed elements of complex, variable patterns in the form of [[SUBJ*'d*] V] and [[SUBJ*'ll*] V]. Their average schema entrenchment and conventionalization are evaluated from a diachronic perspective in a principled, data-driven fashion that takes both their respective overall developments as well as any changes that pertain to the variable slots into consideration. The evidence suggests an increasing dissociation between the enclitics and their respective full forms.

Chapter 6, *Revisiting global and intra-categorial frequency shifts in the English modals*, questions the added value of seeking out a (directed) overall trend in the use of modals, considering that such an approach glosses over individual changes that may not be consistent with any global development of the category as a whole. Moreover, by increasing the level of granularity, the modal system's heterogeneity becomes even more obvious, particularly through the lens of a usage-based, constructionist framework, which invites treating modal expressions, such as [*will* V], [[SUBJ*'ll*] V], and [*won't* V], separately, instead of simply subsuming them under WILL. Finally, it is claimed that distributional changes may need to factor into a linguist's decision when it comes to identifying more coherent, dynamic groups.

Chapter 7, *General discussion*, evaluates the forgoing discussion and the results based on their conceptual, empirical, and methodological contributions. It also contrasts the different approaches that were utilized to investigate modal development in the present work — from *framework-open* to *cognitive-functional, node-centered* to *dynamic, usage-based, network-oriented* — and it expounds both their advantages and potential shortcomings. The chapter concludes with a more general outlook on how to possibly

approach grammatical categories from a diachronic perspective by going beyond purely formal and functional criteria.

2 The frameworks

This chapter comprises the different converging approaches to investigating the development of modals and semi-modals in AmE. Although a more detailed rehearsal of the relevant research will be provided in Chapters 3–6 alongside the respective case studies, some results will be discussed here as well. Section 2.1 focuses on how modal development is typically analyzed from an 'open', corpus-based variationist perspective. Section 2.2 addresses how modal expressions are conceived of in cognitive-functional, usage-based frameworks and how they can be integrated into the associative network that models the linguistic knowledge of speakers. The notion of constructional change, specifically with regard to the modal domain, will also receive attention. Finally, the chapter is concluded with a review on some of the cognitive underpinnings of usage intensity.

2.1 Modal expressions and diachronic corpus linguistics

Since the beginning of the 'quantitative turn' in English linguistics in the 1990s and early 2000s (Kortmann 2020: 244), the empirical research output on modal expressions in general and their development in particular has been considerable. Most of the studies roughly conform to what Szmrecsanyi (2017) has labeled *corpus-based variationist linguistics*, that is, they may not be sociolinguistic variationist in the strictest sense but draw inspiration from that paradigm; for example, investigating (changes in) the alternation between modal verbs and semi-modals, such as *must* vs HAVE *to* or *will* vs BE *going to*. The present work proposes a subdivision of corpus-based variationist linguistic studies whereby the literature can be roughly divided into two main groups. The first group is referred to here as *framework-open* approaches and comprises studies that do not make any explicit theoretical grammatical commitments; the second group, its direct counterpart, will be labeled *framework-driven*.[8] Given the nature of this work's main topic, namely the interest in diachronic changes, the distinction technically narrows down

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[8] The term *framework-open* differs from Haspelmath's (2008) conception of *framework-free* insofar that it allows one to remain agnostic about whether theoretical grammatical commitments are generally problematic.

to whether the pertinent studies subscribe to the cognitive-functionalist tradition or not.[9] For an overview of how this classification scheme applies to the research on the development of modal verbs and semi-modals in AmE, see Table 2.1.

Table 2.1. Studies on the development of modal verbs and/or semi-modals in AmE grouped by absence (frame-work open) or presence (framework-driven) of explicit theoretical grammatical commitments

CORPUS-BASED VARIATIONIST LINGUISTICS	
framework-open	framework-driven
Berglund (2005)	Hilpert (2012, 2016a)
Biber (2004)	Krug (2000)
Denison & Cort (2010)*	Lorenz (2013a, 2013c, 2020)
Jäger (2020)	
Jankowski (2004)	
Johansson (2013)	
Leech (2003, 2004b, 2011, 2013)	
Leech & Smith (2006, 2009)	
Leech et al. (2009)	
Mair (2007, 2015)	
Mair & Leech (2006)	
Millar (2009)	
Myhill (1995, 1996)[†]	
van der Auwera & De Wit (2010)*	
Van Linden (2015)*	
In the present work:	
Chapter 3	Chapters 4–6

* Studies that are marked with an asterisk do not focus on the 'core' modals of English per se but rather modal idioms or comparative modals (e.g. *'d rather*, *should sooner, might as well*), which operate at the periphery of the modal category.
† Although Myhill's (1995, 1996) database of written plays would not necessarily constitute a corpus by modern standards, he does provide quantitative data on the changing frequency distributions of modal expressions of 'obligation' in AmE between 1824 and 1984.

Clearly, the majority of the studies on changes in the modal domain in AmE fall into the first group, which has approached the modal system from a rather 'neutral' perspective, as does the case study in Chapter 3 of the present work.[10] The studies from the second group follow different strands of the cognitive-functional, usage-based framework; see also the case studies in Chapters 4–6. More important than this obvious imbalance in the research output, which I will come back to in the next section, framework-open and

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[9] To my knowledge, there are no studies that investigate changes in the modal system of AmE from a formal perspective (but see Lightfoot 1979). This is not surprising, given the epiphenomenal status generative frameworks typically assign to variation and diachronic change, or the rather insignificant role corpus linguistics plays in this tradition.
[10] The research output for BrE shows a similar underrepresentation of framework-driven studies. In fact, many of the studies listed in Table 2.1 report on both AmE and BrE.

framework-driven approaches differ in how they conceptualize modal expressions and the modal system.[11] In the following, the focus will rest on these conceptual differences and their methodological implications.

2.1.1 English modal verbs

Given their distinctive, morphosyntactically idiosyncratic properties, the 'core' modal verbs of English *will*, *would*, *can*, *could*, *may*, *might*, *shall*, *should*, and *must* constitute the most clearly demarcated group of modal expressions in English. To illustrate, all members can be used as operators in NEGATION, INVERSION, CODE, and EMPHATIC AFFIRMATION (NICE, Huddleston 1980); see the examples in (4).

(4) a.   We **couldn't** stop them.   *We stop not them.   N
     b.   **Should we** stop them?   *Stop we them?   I
     c.   We can stop them and **so can you**. *We stop them and so stop you. C
     d.   Oh yes, we **WILL** stop them.   *Oh yes, we STOP them.   E

While this helps distinguish the modal verbs from lexical verbs, they do share the NICE properties with the primary auxiliaries BE, HAVE and DO, along with their ability to take the negative particle *n't*. Also, just like BE and HAVE, *will* and *would* have fully institutionalized cliticized forms, namely *'ll* and *'d*. What really sets the modal verbs apart from both the primary auxiliaries and lexical verbs, however, is their defective morphological paradigm, namely missing non-finite forms, no subject agreement, and abnormal time reference, as illustrated in (5).

(5) a.   ***to** must   to stop   FINITENESS
          *(BE) must**ing**   (BE) stopping
          *(HAVE) must**ed**   (HAVE) stopped
     b.   *She shall**s** stop them. She stops them.   AGREEMENT
     c.   They **may** stop them.   They stop them.   TIME REFERENCE
              ↕ no longer inflectionally related   ↕ same inflectional paradigm
          They **might** stop them. They stopped them.

In addition, the modal verbs' complementation pattern with bare infinitives is often cited as a distinguishing property (see e.g. Huddleston & Pullum 2002: 106; Leech et al. 2009:

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[11] The general advantages and disadvantages of framework-open and framework-driven approaches will be part of a more in-depth discussion in Chapter 7.

93; Quirk et al. 1985: 137). The retrieval of instances of modal verbs from a corpus thus becomes a rather straightforward matter. Even if a corpus does not provide distinct modal tags or is not annotated at all, a high degree of precision can still be achieved by utilizing the morphosyntactic cues mentioned above to disambiguate potentially homonymous cases, that is where a single surface form maps onto different lexical entries; compare the examples in (6) and (7).

(6)   a.   Peppers **can**MOD be preserved by freezing, pickling, canning, drying and roasting. [COCA, Denver, 2013]

      b.   Berries in Syrup Canning Party: Learn to **can**V blueberries and take home 2 pints. [COCA, Pittsburgh, 2015]

      c.   Angels in the Hebrew Bible never read the wicked their Miranda rights and weren't exactly reluctant to open a **can**N of whoop-ass when necessary. [COCA, NatlReview, 2014]

(7)   a.   And now we **must**MOD prepare for our next big trip! [COHA, Play:Pianissimo, 2000]

      b.   Of course, the right raingear is a **must**N if you don't want seepage of a more tangible nature. [COHA, Bicycling, 2000]

      c.   The space was a big converted garage on Divisadero that smelled like **must**N and beer and old cigarettes. [COCA, Ploughshares, 1998]

Based on formal properties alone then, the modal verbs, as simplex units, represent quite an ideal candidate for corpus-based diachronic linguistic scrutiny. What is more, most of them figure among the most frequent verbs in English (see Figure A2 in the Appendix; cf. also Krug 2000: 26; Leech et al. 2001: 282), which means that sufficient evidence of their use is likely to be found even in corpora that are relatively small.

By contrast, the modal verbs' functional properties represent a rather daunting challenge. The category itself constitutes a many-to-many mapping, that is, each form is associated with several different, related meanings, while a single meaning can also be associated with different forms. This results in both semasiological as well as onomasiological variation, which manifests in language data as patterns of polysemy on the one hand and groups of modal verbs with the same (or similar) communicative goals on the other.[12] Figure 2.1 provides a summary of how English modal verbs map onto different meanings and vice versa.

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[12] The notion that modal expressions are polysemous in nature is not shared across the board. For example, Papafragou (1998) and Wierzbicka (1987) argue for a monosemy approach where each modal verb has one
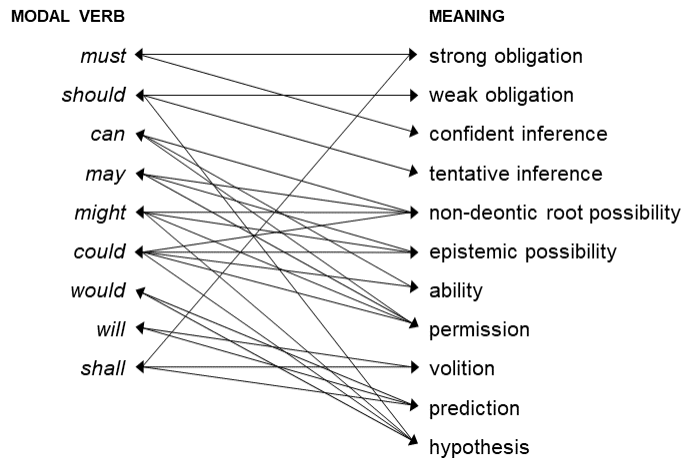
MODAL VERB	MEANING

Figure 2.1. Many-to-many mappings between the English core modal verbs and different modal meanings; adapted from Coates (1983: 5)

Several attempts have been made in the literature to establish a classification of modal meanings (e.g. Bybee & Fleischman 1995; Coates 1983; Depraetere 2015; Depraetere & Reed 2011; Huddleston & Pullum 2002; Palmer 2001; Quirk et al. 1985; van der Auwera & Plungian 1998). These range from coarse-grained, binary distinctions (e.g. 'root' vs 'epistemic', 'intrinsic' vs 'extrinsic', 'agent-oriented' vs 'speaker-oriented) over tripartitions (e.g. 'deontic' vs 'dynamic' vs 'epistemic') to quite granular categories of modal meaning. Corpus-based diachronic studies with a framework-open inclination have adopted various of these classification schemes. Depending on the research question, they either proceed by identifying the different meanings of the instances of (selected) modal verbs that have been retrieved from a corpus (see e.g. Biber 2004; Leech et al. 2009; Millar 2009) or they decide on a specific communicative goal first and retrieve the data for the onomasiological competitors that are assumed to reach that goal (e.g. Jäger 2020; Jankowski 2004; Johansson 2013). Yet, regardless of which classification scheme is eventually applied, the different meaning categories can be conceived of as neither discrete nor internally static but rather as gradient and dynamic. This is not a conceptual argument up for debate but simply the nature of the beast that is diachronic (corpus) linguistics. In addition, gradience does not only become evident in language change. Part of the methodological challenge of (diachronic) corpus linguistics comes from

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meaning that is contextually enriched. Section 2.2 will show that there is no need to uphold the forced dichotomy between monosemy and polysemy if modal meanings are simply viewed as being conventionalized to varying degrees.

interpreting the intended meaning of utterance types in specific concordances. It is here where particularly the research on modal verbs usually finds itself confronted with varying proportions of indeterminacy, that is, when an utterance has multiple possible interpretations and even the larger co(n)text does not provide any decisive cues for the intended meaning (e.g. Coates 1983; Close & Aarts 2010; Depraetere & Reed 2006; Collins 2009; Leech 2003; Leech et al. 2009; Millar 2009; Wärnsby 2006; for a survey of different types of indeterminacy, see also Leech & Coates 1980); see the examples in (8) and (9).

(8)   You vote. You're the one who, you guys are, this is your future. And, you know, we were talking about women. Carly Fiorina is the only female Republican candidate and right now, Fox News **may** exclude her and CNN **may** exclude her from the first debate because of her low poll numbers. [COCA, ABC: The View, 2015]

       'The broadcasters are allowed/permitted to exclude her'   [permission]
       'It's possible that the broadcasters (will) exclude her.'   [epistemic possibility]

(9)   "This is one of the great American industrial franchises of the 20th century," said John Hayes, an analyst at Independence Investment Associates, an institutional money manager that sold its stake of several million Boeing shares last year. "For the business to be in this kind of disarray is unfathomable. These guys have been doing this a long time. They **should** know how to build planes at a profit." [COCA, NYT, 1998]

       'It can be assumed that they know how to build planes at a profit.'   [inference]
       'They have a duty to know how to build planes at a profit.'   [obligation]

Examples of this sort represent instances of what Coates (1983: 14–17) refers to as *merger*, that is, when different possible interpretations seem to neutralize one another. Regardless of the intended meaning, there is no substantial conflict between the different readings. Such cases are not regarded here as a weakness of the different classification schemes, but they are rather taken as a symptom of the presumably gradient nature of modal meaning. The next section will show that this intra-categorial gradience also applies analogously to the semi-modals.

2.1.2 Semi-modals

The semi-modals occupy the same functional space as the core modal verbs but are morphosyntactically more flexible and therefore an important source of conveying modality in English, especially where modal verbs are grammatically unavailable (cf. Section 2.1.1). Due to their formal complexity, (i.e. multi-word structure, mostly intact morphological paradigms, selective *do*-support, inter alia), defining their category is certainly more challenging than in the case of the modal verbs. As a consequence, corpus-based studies, whether framework-open or framework-driven, can differ greatly with regard to their selection of semi-modals. Arguably, the most prominent members of the category are BE *going to*, HAVE *to*, WANT *to*, NEED *to,* and (HAVE) *got to* — BE *able to*, BE *allowed to*, BE *supposed to*, and many other instances of the BE {V$_{past.part}$ | ADJ | ADV} *to* pattern may be added to this group as somewhat more peripheral cases. Just like the modal verbs, the category of semi-modals represents a many-to-many mapping, whereby a semi-modal can have more than one potential meaning or one meaning can be expressed by different semi-modals; see Figure 2.2.
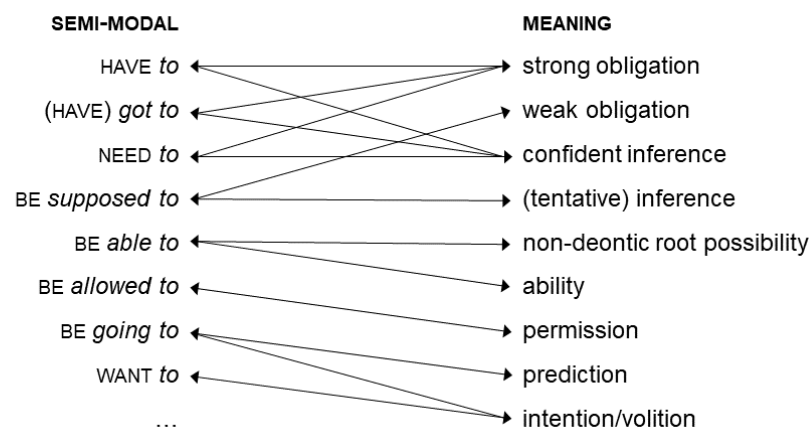
Figure 2.2. Many-to-many mappings between the semi-modals and different modal meanings; partly based on Coates (1983) and Collins (2009)

Although the grid does not quite have the same density as in Figure 2.1, the proposed selection of semi-modals seems to be somewhat capable of roughly conveying most of the meanings that are conventionally expressed by the core modal verbs. This does not imply unconstrained, random variation between modal verbs and semi-modals, but rather a lively competition for selection in reaching the same communicative goals; consider, for

example, the 'strong obligation' space shared by *must*, HAVE *to*, NEED *to*, and others, or the 'prediction and volition' space occupied by, for example, *will*, *shall*, BE *going to*, and WANT *to*. Note, however, that there is not always a periphrastic alternative in form of a semi-modal available to convey a specific modal meaning. An important exception is the lack of onomasiological competition between both categories in expressing 'epistemic (im-)possibility', which still seems to remain exclusively with *could*, *may*, *might*, and *can't*. But considering the ongoing grammaticalization process the semi-modals are subject to and the often-reported, universal tendency for epistemic meanings (e.g. 'possibility', 'probability') to emerge from non-epistemic ones (e.g. 'ability', 'obligation', 'permission') (e.g. Bybee 1985; Bybee & Fleischman 1995; Heine 1993; Hopper & Traugott 2003; Sweetser 1990; but see Fischer 2007, 2015), the semi-modals might simply have yet to enter this particular onomasiological space.

Corpus-based diachronic studies on modal expressions have shown particular interest in semi-modals, not just because they compete for selection with the modal verbs, but also because historical corpus data allow for an assessment of their grammaticalization in progress. While there is a growing body of quantitative research on how to operationalize grammaticalization more accurately (Correia Saavedra 2019; De Troij & Van de Velde 2020; Hilpert 2008; Petré 2015; Szmrecsanyi 2016; inter alia), it is generally maintained that frequency is conceptually tied to grammaticalization, being both a symptom of it and a driving force (Bybee 2003, 2006). For the semi-modals, it has been shown that some of them have undergone significant increases in their usage frequency in the recent history of English, which is characteristic of ongoing grammaticalization (Krug 2000; Leech et al. 2009; Lorenz 2013a, 2013c, 2020; inter alia). Seeing that, at the same time, some modal verbs have been declining significantly in their usage frequency (e.g. Leech 2011; Leech et al. 2009), it appears that some semi-modals have been "managing to conquer parts of the onomasiological space previously occupied by core modals" (Schmid 2020: 174). Further evidence that this process continues to thrive comes from the emergence and (ongoing) emancipation of contracted forms, such as *gonna*, *wanna*, and *gotta* from BE *going to*, WANT *to*, and (HAVE) *got to* respectively (Krug 2000; Lorenz 2013a), which even resemble the core modals formally. While both framework-open and framework-driven approaches interested in the general distribution of modal verbs and semi-modals (across time) typically account for these and other contractions (e.g. *'ll*, *'d*, *can't*, *won't*), they tend do so in different ways. The

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conceptual and methodological implications this brings about will be addressed in the next section.

2.1.3 (Total) accountability and modal expressions

A general guiding principle in corpus-linguistics is *total accountability* (Leech 1992), according to which the data retrieval for any linguistic phenomenon under consideration must be exhaustive, that is, without any conscious pre-selection on part of the researcher that would essentially lead to a confirmation bias and thus be in violation of the scientific method; compare Popper (1935) on *falsifiability*.[13] In other words, researchers should not deliberately choose only the data that support their hypothesis or theory. Total accountability is closely related to a hallmark of the variationist method proposed by Labov (1969, 1982) as the *principle of accountability*, a methodological appeal to sociolinguists to account for all possible variants of a given variable, that is, all "alternate ways of saying 'the same' thing" (Labov 1972: 188).[14] The remainder of this section fleshes out how these principles (may) apply to changes in the modal domain.

Since Leech's seminal (2003) study on short-term diachronic shifts in the English modal system of BrE and AmE, it has been well-established that the overall trend in usage frequency the modal verbs have undergone as a group is one of significant decline in the second half of the 20th century; but see Millar (2009). Such a finding could obviously not have been obtained based on the development of one or a few modal verbs alone, but the analysis needed to include all members of that category which, as mentioned above, is typically treated as rather clearly defined, due to the modal verbs' morphosyntactic coherence. Exhaustive data retrieval then entails that for every temporal data point available all instances of all modal verbs in all their possible morphological (i.e. full forms and contractions) and syntactic configurations (i.e. affirmation, negation, ellipsis, and adverb modification) had to be extracted to meet total accountability. Essentially, the results provide a bird's eye view on distributional changes in the use of modal verbs and represent an important first assessment of where a more in-depth analysis could be worth conducting. Following this, several studies have provided

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[13] This does obviously not include random sampling, which, given the size of some contemporary corpora, has become a necessary methodological step in many cases to reduce the amount of data to a manageable size.

[14] Labov (1982: 87) also acknowledges that this principle might be too strict, as the entire set of variants (or possible choices) might not be fully defined in every case at the time of research.

evidence that, among other things, the distribution of modal verbs is sensitive to genre and register (e.g. Biber 2004; Millar 2009) and that individual trends exhibit serious variability, as they do in the case of the semi-modals (e.g. Leech 2003, 2011; Mair 2015; see also Chapters 3 and 6). This variability deserves further attention. Clearly, no study reports on global frequency shifts in any linguistic category without also reporting on intra-categorial changes in the frequency distribution of its members. But with regard to modal verbs and semi-modals, there are at least three interrelated issues that need to be considered: (i) the level of morphosyntactic granularity, that is, which morphological and syntactic configurations (if any) are treated independently (cf. Chapters 4 and 5), (ii) the point at which conflating the frequencies of members of a category in order seek a larger generalization conceals more than it reveals (cf. Chapters 3 and 6), and (iii) inter- and intra-categorial gradience (cf. Chapter 7). While (ii) probably applies more generally to every corpus-based study, (i) and (iii) relate to accountability in the Labovian sense, more specifically to defining the variable of interest and the variable context by determining all eligible modal expressions that are assumed to be able to functionally compete against one another for selection. In theory, this could be done rather broadly by, for example, treating the modal verb category as the variable and the core modal verbs with all their respective aggregated distributional configurations as its variants. The caveats of this approach would be the potential information loss and the general difficulty to argue for a common functional denominator across all modal verbs. On the other hand, if a category is dissected completely, the resulting information density might render the interpretability of the results nearly impossible. A feasible trade-off lies somewhere in between. The variationist method may be useful in this regard. It shifts the focus from overall developments of a category to the paradigmatic competition between specific forms in a specific functional space. In turn, these results can then be reintroduced into the discussion on changes on a more global scale with a more refined approximation of thereof. This 'zoom-in–zoom-out' procedure can be illustrated with the following example. Consider the modal verb *will*, which competes with, at least, *shall*, BE *going to*, and WANT *to* for conveying 'prediction', 'intention' and 'volition', as is well documented (e.g. Berglund 2005; Collins 2009; Gries & Stefanowitsch 2004; Nesselhauf 2010, 2012; Verplaetse 1999, 2003). But competition can also be expected to take place between *will* and its fully institutionalized contracted forms *'ll* and *won't* (when negated). The same applies to BE *going to* and WANT *to* and their respective contractions *gonna* and *wanna*.

As illustrated in Figure 2.3, accounting for these contracted forms quite alters the perspective on how changes in this onomasiological space progress.
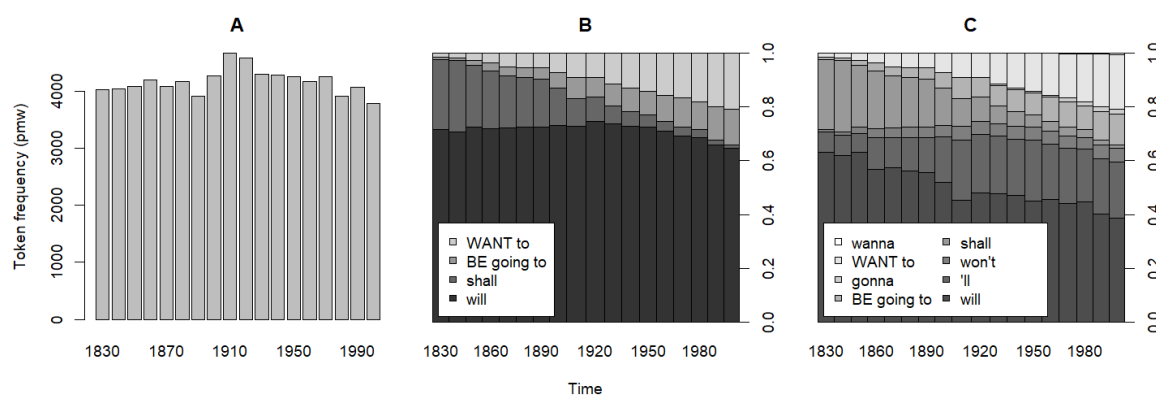
Figure 2.3. Distributional changes of modal verbs and semi-modals expressing 'prediction', 'intention' and 'volition'; COHA, 1830–2009; A: sum total across all selected expressions; B: coarse-grained split; C: (more) fine-grained split[15]

From plot A in Figure 2.3, we learn that no discernable trend (r_τ=.00, p=1) can be identified if the frequencies of both modal verbs and both semi-modals along with their contractions are aggregated. Plots B and C, on the other hand, point to a serious reorganizing of the onomasiological space over the course of the 19th and 20th century. Although all three plots completely neglect any potential changes in the semasiological competition between the different senses associated with each surface form, B and C provide a more accurate description of the changes at hand. The question then is whether an independent treatment of contractions with regard to changes in the modal system can be justified beyond differences in the distributional changes of the surface forms. Previous studies by, for example, Krug (2000) and Lorenz (2013a, 2013c, 2020) have provided evidence that, from a cognitive-functional, usage-based perspective, a fine-grained split, as the one presented in C, is in fact functionally motivated, at least for the conventionalized semi-modal contractions *gonna*, *wanna*, and *gotta*. Chapters 4–6 in this study will argue that the same holds true for modal enclitics and some of the negative modal contractions. The following section will thus address different aspects of the cognitive-functional framework and how they relate to modal development.

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[15] Technically, the negative contraction *shan't* should be listed here as well, but since it is simply too infrequent in COHA to have any noteworthy influence on the data, it was omitted.

2.2 Usage-based approaches to modality and diachrony

The fact that framework-driven, more precisely cognitive-functional approaches in this case, are considerably underrepresented among the studies on changes in the modal system of English begs the question whether they can actually contribute to understanding its complexity. In fact, attempts to model modal expressions from, for example, constructionist perspectives have not gone without criticism (see e.g. Wärnsby 2002, 2016). Yet, it also has to be acknowledged that, although the importance of language change has always been recognized in cognitive-functional, usage-based frameworks, it has not until recently received central attention. Furthermore, while the proponents of usage-based linguistics agree on the relevance of frequency in language processing, language acquisition, the emergence of linguistic structures, and its role in language variation and change, quantitative research does not figure prominently across the board. However, the few corpus-based studies that have addressed modal expressions in AmE from a diachronic, usage-based perspective have shown that this framework can provide valuable insights on the emergence of 'new' modals (Krug 2000), the (ongoing) emancipation of their contracted forms (Lorenz 2013a, 2013c, 2020), and the changes in the associative links modal verbs entertain with their immediate co-text (Hilpert 2012, 2016a). The underlying assumptions of their respective approaches converge, among other things, on their treatment of modal expressions as utterance types of varying degrees of conventionality, the role of frequency with regard to the changes in the modal expressions' underlying mental representations, and the need for a quantitative assessment. The present study agrees with these assumptions. The following sections will thus be used to establish an understanding of the basic notions of the usage-based framework adopted here.

2.2.1 Modal constructions

The term *construction* is quite ambiguous even within cognitive-functional approaches, as it is usually reserved exclusively for multi-word sequences. A different stance is taken in Cognitive Construction Grammar (CxG; Goldberg 1995, 2006), which recognizes constructions on every level of complexity and schematicity — from simplex words (e.g. *game*, *nice*) to partially-filled schemas (e.g. [V-*ed*], [(*not*) *much of a* N]) to fully schematic, complex sequences (e.g. [(DET) (ADJ) N]NP, [SUBJ V OBJ OBJ]DITR) (Goldberg

2013; Stefanowitsch & Flach 2017). Crucially, constructions in this sense are conceived of as patterns of linguistic knowledge that pair a form with a meaning. In its original formulation,

> C is a CONSTRUCTION iff$_{def}$ C is a form–meaning pair <F$_i$, S$_i$> such that some aspect of F$_i$ or some aspect of S$_i$ is not strictly predictable from C's component parts or from other previously established constructions. (Goldberg 1995: 4)

The notion of non-predictability, which translates into either non-compositional meaning or idiosyncratic formal behavior (e.g. unpredictable constraints, deviation from canonical patterns; cf. Hilpert 2014: 14–20), is also maintained as the most characteristic property of constructions in Goldberg's revised (2006) definition.

> Any linguistic pattern is recognized as a construction as long as some aspect of its form or function is not strictly predictable from its component parts or from other constructions recognized to exist. In addition, patterns are stored as constructions even if they are fully predictable as long as they occur with sufficient frequency. (Goldberg 2006: 5)

By introducing *sufficient frequency* as an additional component, Goldberg explicitly embraces the usage-based assumption that frequent exposure to linguistic structures promotes their entrenchment. Although the notion of sufficient frequency is notoriously (and probably deliberately kept) vague, it opens up the possibility to operationalize entrenchment and conventionalization (cf. Section 2.3).[16]

Based on these definitions, modeling modal verbs within a CxG framework seems to be somewhat of a moot point. As words, they are symbolic in nature and thus constitute constructions by definition, which, obviously, has no practical advantages over other approaches to modal verbs. Yet, Hilpert (2016a) provides an alternative approach that views modal verbs as lexico-grammatical patterns (cf. also Hilpert 2008, 2012). From this perspective, modal verbs constitute semi-schematic constructions with the respective modal verb as their fixed element and a following open slot occupied by a bare infinitive, as in, for example, [*can* V] or [*will* V]. But the constructionhood of these sequences is by no means uncontroversial because nothing about them suggests non-compositionality or

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[16] Note that Goldberg, in her most recent work, actually abandons the idea that patterns are only stored if they are sufficiently frequent, arguing that memory traces are likely to be retained upon single exposure, otherwise strengthening of these traces and entrenchment could not occur (Goldberg 2019: 54). The present work agrees with this view but would not dismiss this notion just yet. Assuming that not every stored linguistic pattern is a construction simply by virtue of being stored, sufficient frequency, depending on its conceptualization and operationalization (cf. Stefanowitsch & Flach 2017), could be maintained.

is in any way formally idiosyncratic. A constructional treatment, however, is still plausible if we postulate that the modal verbs' respective collocational profiles are not predictable from any other linguistic knowledge speakers are assumed to have (Hilpert 2016a: 68–72). To elaborate, English modal verbs can co-occur with virtually any lexical bare infinitive, yet they do have certain preferences as to which (groups of) lexical verbs they co-occur with more (or less) often than would be expected by chance. In other words, some MOD + V combinations are more typical than others and part of speakers' knowledge will include the probabilistic, usage-based information about the associative links between a modal verb and its (dis-)preferred verbal collocates (Hilpert 2016a: 70). Viewing modal verbs as complex constructions in this sense capitalizes on the notion of sufficient frequency, operationalized in this case not in terms of simple text frequencies but as a contingency-based measure of their relative degree of entrenchment and conventionalization.

Such a view also has implications for the monosemy–vs–polysemy debate within the context of modal expressions. According to the monosemy-view, every modal verb has one dominant meaning that is pragmatically enriched, whereas the polysemy-view holds that each modal verb codes a variety of interrelated meanings. But a dominant or 'core' meaning must either be an abstraction formed over all the different pragmatically enriched instances or it is simply the relatively most frequent meaning associated with a specific modal verb. In either case, one is forced to consider co(n)textual information for determining that dominant meaning. Upholding a strict division between semantics and pragmatics seems therefore unfeasible. Likewise, the claim that every modal verb encodes different meanings can also not be made without any co(n)textual cues. A constructional treatment may help settle this debate. Assuming that verbal collocates make significant contributions to understanding the meaning of a modal construction and considering that every modal has a distinct collocational profile, its meaning(s) or senses and their sense distribution would be determined probabilistically. From this perspective, it is more plausible to assume that the different meanings associated with a given modal verb are simply entrenched and conventionalized to varying degrees. What is more, changes in the collocational behavior of a modal verb across time would by extension indicate changes in the modal construction's meaning. This allows for a dynamic assessment of which meaning(s) manifest(s) as the most dominant or relatively most frequent one(s) both synchronically as well as diachronically. Figure 2.4 illustrates this with the example of [*may* V] (cf. Hilpert 2021: 76).

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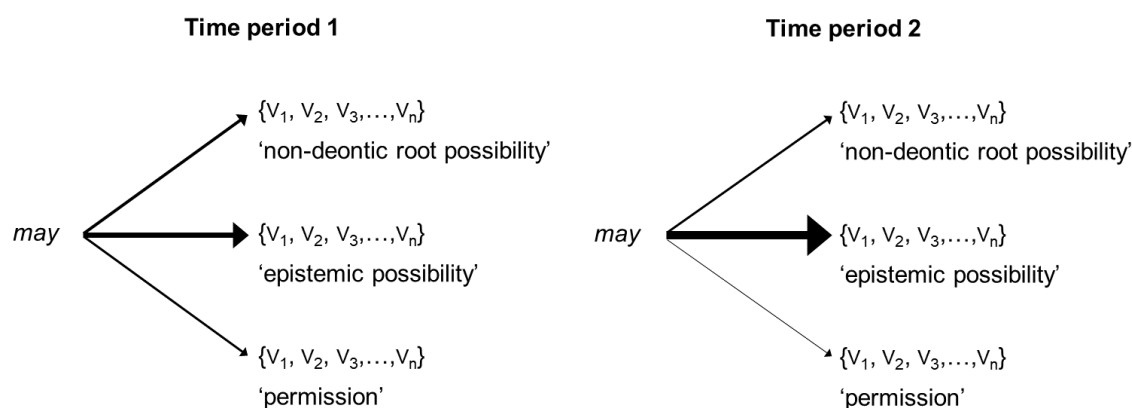
Figure 2.4. Changes in the meaning distribution of [*may* v]

The arrows represent the syntagmatic associations that hold between *may* and its verbal collocates, while the line width indicate the relative preferences of *may* to co-occur with specific (clusters of) verbs that, in combination with *may*, yield different modal meanings.[17] Several studies have found that *may* has undergone a notable shift towards becoming mainly a marker of 'epistemic possibility' (see e.g. Hilpert 2016a; Leech 2003; Millar 2009), which is illustrated here by changes in the line widths from the first to the second time period. Note that the focus rests not so much on *may* itself but rather on the changes in the associative links between *may* and its collocates. That view is very much compatible with dynamic, network-oriented models of linguistic knowledge that emphasize the importance of connections over nodes in the associative network (Diessel 2019; Schmid 2015, 2020; cf. also Section 2.2.2).

The advantages of treating modal verbs as constructions in the CxG sense or, alternatively, as entrenched, variable patterns of associations in models that put connections center stage will be discussed in more detail in Chapters 4–6. Importantly, such cognitive-functional approaches justify a separate treatment of modal expressions and their contracted forms, as depicted in Figure 2.3, because the evidence suggests that at least some of them are highly conventionalized and likely stored separately in the minds of speakers.

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[17] Note that bigrams are not always sufficient indicators of a specific modal meaning, which also means that the verb groups in Figure 2.4 are not clearly demarcated. As with any other linguistic category, we can expect gradience. Some cases, such as *may seem* or *may experience*, can be confidently predicted to convey epistemic meaning, whereas others will require more co-text to be disambiguated.

2.2.2 The modal network

The different strands of CxG generally agree that knowledge of language can be conceived of as a complex, associative repository of constructions of varying degrees of complexity and schematicity (e.g. Booij 2013: 257–260; Goldberg 2006: 13–14, 2013: 15, 21–23). Traditionally, much emphasis has been put on the hierarchical structure of this network and the types of vertical inheritance links that connect constructions of different levels of schematicity, whereas contemporary approaches rather advocate the important role of horizontal (non-inheritance) links between constructions on the same level of schematicity; see, for example, the contributions in Sommerer & Smirnova (2020). In a multi-dimensional, usage-based network, it can be expected that both vertical and horizontal relationships (as well as other conceivable kinds of relationships) play a crucial role.

Speakers' ability to recognize similarities in the form and function of experienced linguistic utterances and to form generalizations over the memorized instances of these utterances (so-called exemplars) leads to gradually building up a hierarchical lexicon in a bottom-up fashion, with constructions at varying levels of schematicity (Diessel 2019: 32; Goldberg 2006: ch. 3; Langacker 1987: 73–75). This process creates vertical links between lower-level constructions and their higher-level 'parents'. The emergence of horizontal links between 'sister' nodes on the same level, on the other hand, is less clear, that is, whether these kinds of links are best described as a relationship of similarity (e.g. Cappelle 2006; Perek 2015) or one of paradigmatic contrast (e.g. Smirnova & Sommerer 2020; Van de Felde 2014), or whether recourse to a more abstract parent construction is still crucial or not (Leino & Östman 2005; Lorenz 2020). Another issue concerns the description of horizontal links as either syntagmatically or paradigmatically organized (or both) (cf. Budts & Petré 2020).

Fleshing this out for modal verbs and semi-modals in a comprehensive way would quickly blow this discussion out of proportion. I will therefore address only a few issues that are relevant for the remainder of this work. Starting with vertical links, naturally, the first question is geared towards the kinds of generalizations that can be expected with regard to modal verbs. CxG and other usage-based approaches to language assume both item-specific knowledge and generalizations. How broad these generalizations can become, however, continues to be a subject of lively debate. A modal construction such as [*will* V] within such an account represents a generalization over a densely populated

cloud of exemplars that has been formed from similar tokens of experience (cf. Bybee 2010, 2013) — in this case, the large number of different *will* + v combinations. In order for this process to take place, a great deal of exemplars must be stored in memory; see Bybee (2010: ch. 2) on 'rich' memory and redundant representation. Among other things, repeated exposure to specific combinations (e.g. *will take*, *will do*, *will see*) will strengthen the mental representation of these instances, which leads to some of them becoming more strongly entrenched than others within that exemplar cloud. We can thus expect this cloud to have a prototype structure and within it, clusters of *will* + v combinations that are relatively more prominent than others. These clusters can themselves probably be conceived of as lower-level generalizations that correspond to the different meaning categories typically associated with *will*; compare also Figure 2.4.[18] And since prototype categories are marked by gradience, these clusters will overlap, which is reflected in language data as cases of different kinds of indeterminacy (cf. Section 2.1.1). Obviously, ongoing language use will constantly reconfigure the cloud of exemplars that represents [*will* v] in speakers' minds, which is why the construction is thus best understood as a dynamic sequence rather than a static structure.

It is not too problematic to assume that the same arguments can be made for the other core modal verb constructions as well. Eventually, the question remains whether speakers would even form a higher-order, fully schematic generalization that subsumes the lower-level modal constructions — namely, a [MOD V] construction. Given the morphosyntactic coherence the modal verbs exhibit as a group, this seems at least somewhat possible. And if speakers entertain such abstractions, a coarse-grained look at the development of modal verbs regarded as a group would receive some justification. There are, however, two issues that need to be considered. First, it has already been shown in Section 1.1 that the developments of individual modal verbs do not necessarily align. While seeing this as clear evidence against speakers forming a more schematic generalization over all modal constructions would be too rash a conclusion to be drawn, distributional changes should at least serve as a first warning sign that (some of) the modal verbs may lead a life of their own. Second, assuming a [MOD V] construction puts one in the tough position to having to identify a constructional meaning. Simply postulating 'modality' or 'non-factuality' as the common functional denominator across all modal constructions is rather unsatisfying. It is also unclear whether speakers would

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[18] Technically, since no linguistic utterance is likely to be pronounced or written in exactly the same way every time it is experienced, even token repetition could lead to some form of abstraction (Schmid 2018b).

come to such a conclusion. This is less problematic for constructions at a lower level. For example, [*can* V] potentially conveys 'ability', 'circumstantial possibility', 'permission' and (rarely) 'epistemic possibility', which are all more or less related to each other via the more general notion of 'possibility'. Relating these meanings to, for example, the 'prediction' and 'volition' meaning of [*will* V] or the 'obligation' and 'epistemic necessity' meaning of [*must* V] is considerably more difficult. Clearly, a researcher's inability to come up with a reasonable functional generalization should not automatically rule out the existence of a [MOD V] construction. Some construction grammarians have even argued in favor of hyper-constructions. These would take the form of grammatical paradigms and subsume all markers of a given category (e.g. all verbal markers of modality), organizing them in a cluster of paradigmatic oppositions, with the meaning of that category being the sum total of the individual meanings of its members (Diewald 2009, 2020; Diewald & Smirnova 2012). The present work will not deny the possible reality of such constructions, but the stance taken here is that constructions are units of linguistic knowledge (or at least a theoretical proxy for a form–meaning association in the minds of speakers). Accordingly, constructional generalizations of any degree of schematicity and complexity may only be posited if there is (indirect) empirical evidence that speakers actually form such abstractions (cf. Barðdal's 2008: 45; Hilpert 2013a: 10–11; also Chapters 4 and 6 in the present study).

This brings us to horizontal links, which are assumed to hold between constructions on the same level of schematicity. Such links have only recently gained currency in CxG, albeit having a long tradition in, for example, lexical semantics. Lexical relations such as synonymy and antonymy basically describe links between lexemes in terms of similarity and contrast, respectively. Since CxG views grammar and the lexicon as a unified continuum of constructions (see e.g. Diessel 2015; Goldberg 2006; Hilpert 2014), links of this nature can be expected to exist on every constructional level, not only between words.

In Construction Morphology (Booij 2010, 2013), the notion of horizontal links (*paradigmatic links* in their terminology) is utilized to address phenomena such as suppletion (or base allomorphy) and formal non-segmentability. For example, rather than assuming that *memorize* is the result of speakers applying some kind of rule that combines *memory* with *-ize* and induces a change of the base, both *memory* and *memorize* will likely be stored in memory and the link between them is understood with relation to other, similar pairs (e.g. *apology – apologize*, *summary – summarize*) (cf. Hilpert 2014:

32

83–85). Chapter 4 in the present work will show that such links may also explain the relationship between, for example, [*will* V] and [*won't* V] without having to assume a common parent construction.

Likewise, Lorenz (2020) considers the systematic similarities and differences between the contracted semi-modals *gonna*, *wanna*, and *gotta* and their respective uncontracted forms to be most aptly described in terms of a meta-construction that captures the proportional analogy between these modal expressions without requiring any recourse to a more abstract generalization (cf. Leino & Östman 2005). In essence, the meta-construction represents a generalization over horizontal relationships, similar to Booij's (2010) notion of paradigmatic links (cf. also Chapter 6).

Budts & Petré (2020) argue that the advantage of horizontal links lies in their ability to express both paradigmatic and syntagmatic relations, whereby constructions on the same level can be paradigmatically associated with each other based on their morphosyntactic and semantic similarity, and/or syntagmatically associated with each other based on their above chance co-occurrence. To illustrate, modal verbs such as *must* and *should* have a common morphosyntactic distribution and are to some extent functionally related in expressing 'obligation' and 'necessity', which indicates that they are paradigmatic competitors; both modal verbs are also syntagmatically associated with their following verbal collocates (e.g. *must say*, *should go*). In turn, these collocates are paradigmatically associated with each other. This would result in a complex network of associative links on the horizontal dimension. Figure 2.5 provides a partial sketch for *must* and *should*.
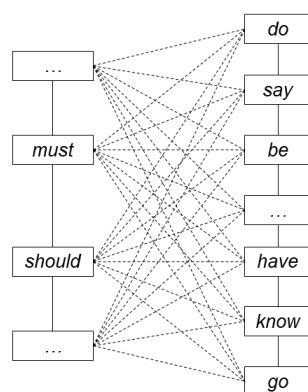
Figure 2.5. Simplified partial network of associative links between *must*, *should*, and their verbal collocates; solid lines represent paradigmatic associations, dashed lines represent syntagmatic associations

For the sake of simplicity, solid lines representing paradigmatic associations were only drawn between nodes that are next to each other in the picture. In reality, these will be just as abundant as the syntagmatic links. What makes Budts & Petré's (2020) approach intriguing for the study of language change is that diachronic developments can be accounted for dynamically as changes in the associative links. Moreover, constructional similarity may be identified if it can be shown that two or more modals share a common usage-profile (e.g. matching collocational preferences), which would strengthen their paradigmatic associations (Budts & Petré 2020: 343). The similarity between negative modal contractions such as *won't* or *can't* and the negative form of periphrastic DO, namely *don't*, are part of the discussion in Chapter 6 of the present study.

Finally, Schmid's (2015, 2020) *Entrenchment-and-Conventionalization Model* (EC-Model) offers a more parsimonious take on the subject of language networks and network relations that dispenses with many of the notions mentioned above. The EC-Model shifts the focus completely away from nodes (i.e. constructions) towards the connective links in the network. These links, however, are not described in terms of vertical and horizontal dimensions, nor do they necessarily describe the connections between constructions, but everything boils down exclusively to patterns of associations. In fact, Schmid (2015: 11–12) argues that symbolic associations, syntagmatic associations, paradigmatic associations and pragmatic associations are sufficient to describe the emergence of language structure and changes in the language system. In Schmid (2020), these four patterns and their relevance for linguistic knowledge are described as follows:

> *symbolic associations* linking linguistic forms and meanings, *syntagmatic associations* linking sequentially arranged forms and meanings, *paradigmatic associations* linking competing forms and meanings, and *pragmatic associations* linking forms and meanings to contexts. If these patterns of associations are repeated because they are activated recurrently by similar usage events, they become more and more strongly entrenched on different levels of generalization. This creates the linguistic knowledge in the minds of individuals which is required for processing language in the first place, and it also contributes to the continual refreshment and reorganization of this knowledge. (Schmid 2020: 5; emphasis original)

While construction grammarians typically speak of constructions as entrenched nodes in the mental network, it is essentially the links that are entrenched to varying degrees in the minds of speakers in the EC-Model. Given that nodes are regarded as somewhat epiphenomenal, committing to this model relieves one from having to decide when the

status of construction is well deserved and can be posited — something that is particularly difficult to identify in diachronic data (cf. Chapter 4 in the present study). The present study will draw on a ideas from the EC-Model with regard to the emancipation of the modal enclitics *'ll* and *'d* from their historically related full forms *will* and *would* (cf. Chapter 5).

2.2.3 Constructional change

Diachronic Construction Grammar (DCxG) is a fairly young research field that aims to account for language change more or less explicitly in terms of changes in the linguistic knowledge of speakers (Hilpert 2013a; Traugott & Trousdale 2013). The link between usage intensity and the mental representation of language structures is widely accepted in synchronic constructionist approaches with a usage-based, mentalist commitment (e.g. Croft 2001; Goldberg 2006, 2019; cf. also Section 2.3).[19] Corpora are often turned to as a main source for retrieving the kinds of frequencies that would eventually enable researchers to make inferences about the storage and processing of language. Unlike synchronic research, however, in which corpus-based results can be complemented and possibly validated with experimental data, historical corpora are the only source of evidence in diachronic research.[20] In this regard, Hilpert (2018) rightfully points out that

> historical corpora […] give us only a very rough idea of language use in the past. It is therefore an open question how confidently we can make statements about the linguistic knowledge of earlier generations of speakers. (Hilpert 2018: 22)

Given that the limitations of historical corpora in providing researchers with concrete insights into a language system apply to all corpus-based diachronic studies alike, it seems odd to introduce another variable, namely COGNITIVE REALITY, to the discussion, especially when that variable may be rather difficult to investigate in (diachronic) corpus data. There are a few points to consider.

First, not all diachronic studies with a constructionist or usage-based background commit explicitly to cognitive reality and psychological plausibility. In fact, Mengden &

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[19] In this context, *synchronic* refers to the study of present-day English.
[20] Corpora are understood here in a very broad sense: any textual record in digital form that contains naturally produced language and is used for retrieving linguistic data and distributional information constitutes a corpus. Accordingly, digital dictionaries, such as the OED, would also fall under this definition (cf. Hoffmann 2004; Stefanowitsch 2020).

Coussé (2014: 8–13) argue that usage-based approaches to language (change) need not be necessarily centered around cognition but can also focus on the social and communicative dimension of language instead. They propose that

> a linguistic system cannot be located exclusively in a speaker's mind, but, in order to be useful in communication, the same system needs to be shared by other speakers of the same speech community to a high degree. (Mengden & Coussé 2014: 9)

The distinction between the cognitive and the socially-shared aspects of language is also emphasized strongly in the EC-Model. Schmid (2015: 10; 2020: 2) explicitly states that entrenchment, as a cognitive process that happens in the minds of speakers, and conventionalization, as a social process that establishes and sustains communal linguistic conventions, should not be conflated. Both processes, however, are connected through usage and constantly feed back into it (Schmid 2020: 4–7), which begs the question what usage data reveal in the first place — something about the conventionalization of a linguistic utterance in speech community or its entrenchment as a pattern of associations on the level of individual speakers? The methodological implications that follow from this will be addressed in Section 2.3.

Second, the fact that constructionist approaches have traditionally dealt first and foremost with constructions as symbolic form–meaning pairings automatically evokes a reference to the linguistic knowledge of speakers. Even if any further commitments to cognitive reality remain implicit beyond this basic assumption, DCxG can generally be viewed purely as an alternative descriptive framework because it changes the perspective from macro phenomena of language to individual linguistic units. In Section 1.1 of the present work, it was claimed that changes in the modal system are constructional in nature, which, among other things, constitutes a plea to be mindful of the heterogenous nature of individual diachronic shifts in the use modal verbs rather than the developments of the category as a whole. By doing so, a higher degree of descriptive accuracy can potentially be achieved.

Third, while any framework-driven or framework-open approach to changes in the modal system can of course utilize the same data and operate on the same levels of granularity, the commitment to cognitive reality in DCxG, however im- or explicitly made, has the additional advantage that it justifies treating frequency shifts not only as

merely an indicator of change in the linguistic system but frequency itself as an explanatory factor.

A DCxG approach, however, is not without its complications. An important obstacle originates exactly from the conception of constructions as holistic form–meaning pairings, more specifically the kinds of changes we can expect them to undergo. It is uncontroversial in any framework that linguistic structures can change, among other things, in terms of their form (e.g. the formal change of the possessive determiner *mine* to *my*), function (e.g. change in the semantics of *nice* from 'foolish, simple' to 'pleasant'), or both (e.g. the development of GO as a lexical motion verb to BE *going to* as a marker of grammatical future). With regard to constructions, it is also uncontroversial that changes can pertain to either their form or meaning pole, which is typically discussed in terms of *constructional change* (Hilpert 2013a; Traugott & Trousdale 2013). Investigating the combination of both, on the other hand, can be a bit thornier, certainly when the focus rests on constructions as nodes in a network. If a new form combines with a new meaning, that pairing, by definition, would constitute a new construction, hence a new node. Traugott & Trousdale (2013: 22) refer to this as *constructionalization*. Despite its apparent appeal, it has been argued by, for example, Flach (2020c, 2021) and Hilpert (2018) that gradual constructionalization is impossible to operationalize, that is, to pinpoint the exact moment when a node is actually created because there is no principled way to unambiguously distinguish between constructional change and constructionalization (cf. also Chapter 4). By shifting the focus to changes in the associative links rather than changes in the nodes themselves, any arbitrary cut-off points between constructional change and constructionalization can be avoided. Instead, changes in the network can simply be described as the emergence, strengthening, weakening, and disappearance of connections (Hilpert 2018: 30–31; cf. also Schmid 2020). Flach (2020c: 48) proposes that constructionalization should be reserved for a construction's point reading of what a researcher defines as a node. Constructional change, on the other hand, subsumes all the processes that pertain to that node('s links) and that are observable in corpus data, which invites an operationalization of constructional change in the spirit of Hilpert's (2013a: 16) definition (Flach 2021b: 278). If constructional changes are assumed to include, among other things, any changes in distribution, collocational preferences, and diffusion in the speech community, it is possible to remain (to some degree) agnostic about whether modal expressions need to be conceived of as constructions in the CxG sense, that is, as form–meaning pairings (e.g. Croft 2001;

Goldberg 1995; 2006), or as patterns of associations in the EC-Model sense (Schmid 2020), or as mere linguistic units of interest from a framework-open perspective, as long as these changes operate selectively. Hilpert (2018: 33) concludes that both node-centered and connection-centered approaches essentially address the same phenomenon but highlight different aspects of it.

2.3 From corpus data to cognition

As mentioned in the introductory chapter of this study, introspective methods are of little help when it comes to tracing the diachrony of linguistic structures. Utilizing historical corpus data and applying corpus linguistic methods to trace changes in the modal system is therefore inevitable. While the corpora and methods used in the present work will receive detailed attention in the respective case studies, this section discusses the different operationalizations of usage intensity and how they relate to entrenchment and conventionalization.

Since Schmid's original proposal of the corpus-to-cognition principle, which assumes a correlation between text frequency and cognitive representation (Schmid 2000: 38–40), its exact nature has been subject to serious scrutiny and debates (Arppe et al. 2010; Blumenthal-Dramé 2012; Bybee 2010; Gries 2018, 2020; Gries & Ellis 2015; Hilpert 2013a; Mukherjee 2004; Schmid 2010, 2020; Schmid & Mantlik 2015; Stefanowitsch & Flach 2017; inter alia). Given the multi-faceted nature of both entrenchment and conventionalization, no single corpus-based measure can reasonably be expected to account for either in their entirety. Instead, different measures will bring different aspects to the fore. More importantly, the appropriateness of a measures will depend on the kinds of linguistic structures it is applied to (Stefanowitsch & Flach 2017).

The most basic kind of usage intensity is token frequency (either as raw token frequency or normalized token frequency), which simply represents the textual occurrence of a linguistic structure in a corpus. For fully specified, simplex units, namely monomorphemic words, Stefanowitsch & Flach (2017: 109) argue that token frequency can be used as an approximation of their relative degree of entrenchment. Importantly, in diachronic studies, corpus size must be accounted for in order to make any meaningful comparisons between different temporal data points. Since diachronic corpora typically suffer from a rather uneven sampling, it is common procedure to normalize the frequency

counts. With regard to modal verbs, which constitute such simplex units, it seems therefore straightforward to simply trace their distributional changes across time to make inferences about changes in their mental representation. For the semi-modals, this may be more controversial. As multi-word structures, they are obviously more complex than the core modal verbs. Even if they are treated as holistic units, usually one element is schematic, which captures the different inflections (e.g. BE *going to > is going to*, *were going to*; WANT *to > wants to*, *wanted to*). It is not clear how these different instantiations contribute to the entrenchment of the whole expression (see e.g. Blumenthal-Dramé 2012; Hay & Baayen 2005). The present work therefore views shifts in (normalized) token frequencies as an important first but essentially very rough indicator of change. Further complicating factors are the polysemic nature of modal expressions as well as their development relative to their functional competitors.

Changes in semasiological and onomasiological competition can be captured by relative frequency (or unconditional probability). According to Schmid (2015: 21), frequency counts of individual items have to be measured, among other things, against the frequencies of paradigmatic competitors to allow for any meaningful predictions regarding that unit's conventionality and entrenchment. The role of relative frequency is also emphasized strongly in Hilpert (2013a: 17), who argues that changes in relative frequency can be seen as an indicator that the underlying cloud of exemplars representing a semasiological or onomasiological space in the minds of speakers is reorganizing; see also Lorenz (2013a) for the relevance of relative frequency in describing the progress of 'emancipation', that is, the increasing independence of a contracted form from its full form (e.g. BE *going to > ∅ gonna*). The merits of relative frequency are also well-known in framework-open approaches to modality; for example, Leech (2003: 232–234) and Millar (2009: 202–204) discuss changes in the sense distribution of specific modal verbs, namely *should*, *may*, and *must*. In line with the variationist method, both studies also address the competition between modal verbs and semi-modals; see also Collins (2009). Both (normalized) token frequencies and relative frequencies are used in all case studies of the present work.

If modal verbs and semi-modals are treated as complex, partly variable patterns, for example, [*might* V] or [*gotta* V], any changes in (normalized) token frequencies of such patterns paint a rather incomplete picture, as they do not reveal anything about the schematic slots. To address this, one possibility is to take a closer look at the dispersion within the slot (cf. Flach 2017a; Gries 2013). If a specific slot shows a rather even

dispersion, it means the elements within are distributed uniformly, which can be interpreted as a higher degree of variability. Conversely, a distributional skew would result in an uneven dispersion and point to specificity, that is, the pattern may be used in rather limited ways. Tracing the dispersion across time allows for an assessment of whether a pattern is becoming more (or less) flexible (cf. Chapter 5). Alternatively, coarse-grained measures such as type frequency can be utilized in different ways to measure a pattern's productivity. A more productive pattern suggests a higher degree of generalization and schema entrenchment (or routinization of paradigmatic associations) (Bybee 2010; Croft 2001; Schmid 2015, 2020; Stefanowitsch & Flach 2017; Taylor 2012; inter alia). Chapter 5 of the present work discusses the productivity of the English modal enclitics [[SUBJ*'d*] V] and [[SUBJ*'ll*] V].

Since modal constructions represent prime examples of lexico-grammatical patterns, that is, the combination of a grammatical element (MOD) with a lexical element (V), association measures (e.g. G^2, log10-transformed *p*-values of a Fisher-Yates exact test, binomial test) derived from contingency tests can be used as an approximation of their entrenchment (Gries 2012; Gries & Stefanowitsch 2004; Stefanowitsch & Flach 2020; Stefanowitsch & Gries 2003; inter alia).[21] Such measures take both frequency-based and probability-based factors into account; more specifically, they account for

> the co-occurrence frequency of the elements relative to their individual frequencies [and] the frequency of co-occurrence relative to the overall size of the corpus [estimated in overall construction frequency on the same level of granularity]. (Stefanowitsch & Flach 2017: 115)

With regard to modal constructions, they provide information about which verb infinitives occur with a specific modal verb more (or less) often than would be expected by chance. Chapters 4–6 exploit different association measures to identify verb clusters that are typically associated with a given modal construction to assess its constructional meaning.

Finally, a brief note of caution on entrenchment and conventionalization with regard to corpus frequencies is in order. Since entrenchment is a cognitive process, it

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[21] In CxG contexts, association measures are typically discussed in terms of *collostructional analysis* (for an overview, see Stefanowitsch 2013). Collostructional analysis has not gone without criticism (e.g. Bybee, 2010; Küchenhoff & Schmid, 2015; Schmid & Küchenhoff, 2013). Several studies, however, attest to its merits and its ability to produce results that converge with findings from psycholinguistics (e.g. Gries 2012, 2015; Gries et al. 2005; Gries & Wulff 2009; Wiechmann 2008).

operates on the level of the individual speaker; conventionalization, on the other hand, happens on the level of the speech community (Schmid 2010, 2015, 2020; Schmid & Mantlik 2015). Frequency counts from corpora are typically aggregated, meaning that they represent the linguistic output produced by many speakers and usually do not highlight individual variation (but see e.g. Neels 2020; Petré & Van de Velde 2018; Schmid & Mantlik 2015). Such aggregated counts can therefore not reveal anything specific about an individual's mental representations, but, at best, provide some insights on 'average' entrenchment (Stefanowitsch & Flach 2017: 122). How this then differs from conventionalization depends on whether corpus data are viewed as the output of average speakers (conventionalization) or as the input average speakers are likely to receive (entrenchment) (Stefanowitsch & Flach 2017: 122). While the present work assumes that corpus data can always provide some information on both entrenchment and conventionalization, it also acknowledges the fact that frequency counts from corpora aggregated across many speakers (or authors) are methodologically not very 'clean' in the sense that, without knowing the variability within the data, the influence of potential 'outliers' is difficult to determine.

2.4   Chapter summary

This chapter has laid the groundwork for discussing changes in the modal system, more specifically, the development of modal verbs and semi-modals in AmE. A concise overview of previous studies on the subject was provided and the studies were discussed in terms of their grammatical theoretical commitments. The morphosyntactic, functional, and distributional properties of modal verbs and semi-modals were addressed and how this is dealt with from a framework-open as well as a framework-driven perspective. Special emphasis was put on the advantages of treating modal expressions as either constructions in the CxG sense or as complex, partly variable patterns of associations in the sense of connection-centered models. It was argued that especially the notion of constructional change provides a valuable contribution for understanding how changes in the modal system progress. The chapter was concluded with a discussion on the different kinds of corpus frequencies that will be utilized in the present study and what they reveal about entrenchment and conventionalization.

3 On the development of modals and semi-modals in American English in the 19th and 20th centuries

The article in this chapter is the author accepted manuscript of the study that has been published as:

Please quote from the original publication.

Abstract

The purpose of this study is to shed new light on the diachrony of modal expressions in AmE and relativize earlier results concerning particular patterns of modal development that have long since been accepted among linguists. First, I will provide data from COHA on a relatively uncharted research field, i.e. modal/semi-modal variation and change in 19th century AmE. Secondly, while my data confirm a general decline in the frequency of the modal verbs in AmE over the 20th century, a closer look at their long-term individual developments suggests that particularly the subdivision of the modals into frequent and infrequent ones and the *bottom weighting* of the frequency loss observed in Leech (2003, 2011, 2013) and Leech et al. (2009) need revision. And thirdly, the opposing frequency shifts of *will* and BE *going to* will receive some attention, as their respective developments point to a possible overall change in referring to future time in English.

3.1 Introduction

Modal variation and change has received a lot of attention over the past few decades, with the modals and semi-modals being among the most frequently cited cases regarding grammatical change in English. Studies on the restructuring of the modal system generally indicate a significant decline in the use of modals (e.g. *shall*, *must*), while at the same time, a group of semantically related expressions, commonly referred to as semi-modals (e.g. BE *going to*, HAVE *to*), undergoes a remarkable overall increase. Given that most of these studies (e.g. Leech 2003; Smith 2003; Mair & Leech 2006; Leech et al. 2009; Leech 2011; Leech 2013; Smith & Leech 2013; Mair 2015) are either entirely or partly based on data obtained from the *Brown family of Corpora* (BROWN), the increasing availability of new corpora encourages further research in this field — certainly because some of the findings of these studies are hardly ever challenged.[22,23]

This paper introduces new and more fine-grained data on modals and semi-modals in AmE over the span of the 19th and 20th century obtained from the *Corpus of Historical American English* (COHA) (Davies 2010) and the *Corpus of Contemporary American English* (COCA) (Davies 2008–).[24] These data will be measured against the aforementioned findings, i.e. (i) the overall decrease in the use of modal verbs, (ii) the persistence of this trend, (iii) the underlying pattern observed, and (iv) the rise of the semi-modals. I will furthermore turn to a particular modal/semi-modal pair, namely the case of *will* versus BE *going to*, as their respective frequency shifts indicate a significant change regarding future time reference in AmE.

3.2 Previous research on modal variation and change

This section provides a concise summary of some of the data concerning modal verbs and semi-modals in English that have become quite well-known over the past decades. I will

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[22] Counterevidence for the overall modal decline was first attested in Millar (2009). Even though his study focuses purely on data from the *TIME Magazine Corpus* (TIME) (Davies 2007–), which may be representative of that particular news magazine only and should thus be treated with caution (see Leech 2011 for a detailed and critical discussion), it certainly illustrates the importance of considering additional resources, as the data appear to be quite sensitive towards situationally-defined variations.

[23] BROWN (all capitals) refers to the AmE component of the Brown family of corpora, i.e. (B-Brown), Brown and Frown.

[24] Note that all the data from COCA have been obtained prior to its most recent update in December 2015.

carry out my analysis in reference to some prominent results and test whether they can be upheld under the premise of new evidence provided in Section 3.5.

The first observation regarding modal verbs concerns their overall development, more specifically that the frequency of English modals has decreased significantly over the past 50–100 years (cf. e.g. Leech 2003; Biber 2004; Leech et al. 2009; Leech 2011; Seggewiß 2012; Leech 2013; Smith & Leech 2013). This trend is found in the two national standard varieties AmE and BrE and it appears to be more acute in spoken registers. The AmE data on modals from Leech et al.'s (2009) study, which will serve as a starting point for my analysis, are shown in Table 3.1.

Table 3.1. Frequencies of modals in AmE based on BROWN (Leech et al. 2009: 283) and COHA (Leech 2011: 553)

	BROWN			COHA		
	Brown (1961)	Frown (1991)	Change(%)	1960s	1990s	Change(%)
would	3,053	2,868	*-5.2	3,485	3,219	**-7.6
will	2,702	2,402	***-10.3	2,968	2,677	***-9.8
can	2,193	2,160	-.7	2,131	2,346	**10.1
could	1,776	1,655	-6.0	1,994	2,084	4.5
may	1,298	878	***-31.8	811	645	***-20.5
should	910	787	**-12.8	770	697	-9.5
must	1,018	668	***-33.8	807	522	***-35.3
might	665	635	-3.7	667	581	*-12.9
shall	267	150	***-43.3	155	72	***-53.5
ought (to)	69	49	-28.4	90	49	***-45.6
need(n't)	40	35	-11.7	25	16	-36.0
Total	13,991	12,287	***-11.4	13,903	12,908	***-7.2

Note: The asterisk '*' indicates different levels of statistical significance: (*) *p*<.05, (**) *p*<.01, (***) *p*<.001. Also, the data from BROWN show the raw frequencies, while the frequencies in COHA are normalized per million words (pmw). In both cases, 'Change(%)' is based on the frequency (pmw).[25]

According to the BROWN figures in Table 3.1, there is a significant 11.4% decrease in the frequency of modals regarded as a whole between 1961 and 1991 in AmE.

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[25] The log-likelihood values (LL values) in the COHA column are not given by Leech but were added using his (2011) figures and procedure which, curiously, seem to rely on normalized frequencies to calculate the significance levels. I am grateful to Paul Rayson for confirming that LL values take different corpus sizes into account and should thus be calculated on the basis of raw rather than normalized frequencies (p.c., February 2016). While this would not really be dramatic in the case of the BROWN data (given that each corpus in BROWN contains roughly one million words), using frequencies (pmw) for the LL values of the COHA data underestimates the actual significance in most cases. This certainly explains the differences in the significance levels presented here as compared to Leech (2011: 553). I also thank Christian Mair for explaining the inconsistency between his (2015) and the data obtained by Leech et al. (2009) regarding the percentage changes in the frequency distribution observed for modals from Brown to Frown. He identified two possible error sources — (i) differences in the databases used, i.e. BROWN (untagged) as opposed to BROWN (tagged), and (ii) differences in rounding the normalized frequencies (Mair p.c., March 2016).

Furthermore, individual modals decline at different rates (e.g. *can* -.7%, *shall* -43.3%). Table 3.1 also shows that this general trend was confirmed in Leech (2011) with data obtained from COHA. Between the 1960s and the 1990s the modals undergo a significant overall 7.2% loss in frequency.

Leech's (2011) study also substantiates a second hypothesis, i.e. that demise of the modals appears to be a long lasting trend, which Leech (2003) and Leech et al. (2009) could only speculate on, as BROWN, at the time, covered a thirty-year period that was represented through two data points only. With decadal data points spread over one hundred years and a significantly larger size in terms of overall word count, Leech's COHA data indicate that "the decline of modals has been general in AmE since the 1910s" (2011: 552). By contrast, a more recent contribution to modal/semi-modal variation and change based on BROWN by Mair (2015) suggests that the long-term trend of modal decline cannot be confirmed. He extends the findings in Leech et al. (2009) with data from the 1930s analogue of BROWN (namely B-Brown), which was not available to Leech at the time. From B-Brown (1930s) to Brown (1961) the modals increase by 12% at a significance of $p<.0001$, which almost completely counterbalances the 12.2% decline from Brown (1961) to Frown (1991) resulting in an insignificant overall decline of 1.6% over the entire 60-year period (cf. Mair 2015: 131–132). Consequently, Mair rightfully questions which evidence to trust —

> three small but carefully matched corpora [B-Brown, Brown and Frown], which show ups and downs in consecutive thirty-year intervals levelling out to stability, or a less rigidly structured mega-corpus [COHA], which records a statistically significant decline of the modals for the same period and the 20th century as a whole [by 20.9%]. (2015: 133)

The differences between the corpora are quite well-known. A survey of the composition of COHA, i.e. size and internal structure, is provided by Davies (2012a). For details on the architecture of BROWN see, for example, Leech et al. (2009: 24–50) and Hundt & Leech (2012: 176–180). Both the advantages and disadvantages of using larger or smaller corpora continue to be subject of an ongoing debate; with reference to COHA and BROWN, these are discussed in Davies (2012b) and Hundt & Leech (2012). While it is suggested that BROWN shows a higher degree of accuracy with regard to sampling and tagging (cf. Hundt & Leech 2012: 178–19), the advantages of COHA concerning the overall word count, covered time span and the availability of numerous data points cannot be so easily dismissed (cf. Davies 2012b: 161–163). In line with Hundt & Leech (2012),

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Mair also argues in favor of using small corpora (such as BROWN) "which are both stratified by genre internally and carefully matched for genre for comparison across corpora" (2015: 133). The importance of considering register-specific variations concerning the frequency distribution of modal expressions has been shown in various studies (e.g. Biber 2004; Leech et al. 2009; Leech 2011), but it should be acknowledged that both BROWN and COHA have a register-balanced structure and do not simply represent a big, undifferentiated pile of data. Yet, the choice in favor of COHA is sensible here on the premise of providing new evidence regarding the variation and change of modal expressions in AmE, especially with data from the 19th century.

Furthermore, Leech (2003, 2011, 2013) and Leech et al. (2009) point a specific pattern of modal decline, labelled as a "'bottom weighting' of the frequency loss" (Leech et al. 2009: 73). Accordingly, there is a tendency for the most frequent modals (*will*, *would*, *can*, *could*) regarded as a group to remain relatively stable in their frequency across the decades, whereas the lower frequency modals decline even further and become more marginalized. This pattern is shown in Figure 3.1.
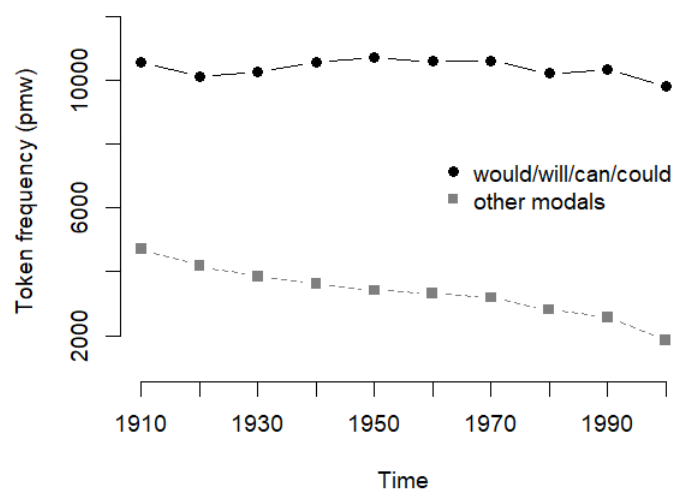
Figure 3.1. Declining frequency of the seven less frequent modals in COHA, contrasted with persisting frequency of the four most frequent modals (Leech 2011: 555; Leech 2013: 103)

From the curve progressions in Figure 3.1, Leech's conclusion seems quite plausible. The downwards trend of the less frequent modals (grey curve) is as much as 60.6%, while the overall decline of the four most common modals (black curve) only amounts to 7.0% over the course of the 20th century. Consequently, it seems as if the low(er) frequency modals

are responsible for the overall modal decline. This picture, however, is misleading for a number of reasons to be discussed in Section 3.5 of this study. With data from both BROWN and COHA, I will show that Leech's conclusion regarding this observed pattern is based on a misconception and should thus be revised.

In seeking an explanation for the demise of the modal verbs, the focus is generally shifted towards the semi-modals. The final issue that is investigated here concerns their overall development, which, in contrast to the modal verbs, shows a significant increase in contemporary English (see e.g. Leech 2003; Millar 2009; Leech 2011); in some cases (e.g. HAVE *to*, WANT *to*, BE *going to*), their increased usage can (at least in some registers) even be traced back as early as late ME or EModE (see e.g. Krug 2000; Biber 2004). The AmE data from BROWN indicate that the semi-modals have increased in their use by 18.5% from Brown to Frown (cf. Leech et al. 2009: 286) and by 43.4% from B-Brown to Frown (cf. Mair 2015: 137).[26] Given their overall rise and their status as syntactic and semantic modal competitors, it is tempting to assume that the semi-modals are gradually usurping the functions of the modal verbs. However, a number of studies (e.g. Biber et al. 1999; Leech 2003; Mair & Leech 2006; Leech et al. 2009; Leech 2013) show that the semi-modals as a whole are still seriously outnumbered by the modal verbs in PDE, thus refuting the *displacement hypothesis* in general. Only the respective frequency distributions of *must* and HAVE *to* as a competing modal/semi-modal pair suggest otherwise.

3.3 The selection of modals and semi-modals in the present study

Researchers do not agree on the classification of modal expressions and studies may vary considerably as to which expressions are included in their analyses. The category MODALITY, as any other linguistic category, shows gradience. Members can be determined on the basis of morphosyntactic and/or semantic criteria, but also from a synchronic or diachronic perspective. But due to the ongoing change within the modal system, no classification is likely to be permanent.

For the present study, I will focus on two sets of modal expressions. The first set, henceforth simply referred to as modals, which includes *will*, *would*, *can*, *could*, *shall*,

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[26] The overall percentage change in the use of the semi-modals from B-Brown to Frown is not provided by Mair but was calculated on the basis of his figures for individual semi-modals (cf. 2015: 137).

should, *may*, *might* and *must*, is arguably the most coherent. All members of this set conform to Huddleston's (1980) NICE properties, the criteria for modal auxiliaries discussed in Quirk et al. (1985: 120–128), and further exhibit the ability to convey both 'epistemic' and 'root' meaning (cf. Collins 2009: 19).[27] The second set, commonly called semi-modals, is characterized by its rather loose definition. While there seems to be agreement on its more prototypical members, namely HAVE *to* and BE *going to*, the status of less typical examples, such as BE *able to* or BE *allowed to*, and a broad spectrum of possible contenders (e.g. BE *about to*, BE *meant to*) indicate class-internal heterogeneity. The suggested list of semi-modals analyzed here includes HAVE *to*, BE *going to*, WANT *to*, NEED *to*, (HAVE) *got to*, BE *able to*, BE *supposed to*, BE *allowed to* and BE *to*. These periphrastic expressions are characterized by having distinct formal, functional, and semantic attributes: (i) they are constructed with a following infinitive marker (that may be weakened in colloquial speech, e.g. WANT *to* > *wanna*, BE *going to* > *gonna*); (ii) they can operate as suppletives where the modals are morphosyntactically unavailable, cf. e.g. **musted* vs. *had to*; (iii) they have undergone some degree of grammaticalization, e.g. phonetic reduction as in *gotta*, or semantic change from possessive HAVE to semi-modal HAVE *to* indicating obligation; and (iv) they are semantically competing (to some extent) with at least one of the modals, cf. e.g. *You must be joking* and *You've got to be joking*.[28]

Note that peripheral or marginal cases, such as *dare (to), used to, ought (to)* and *need(n't)* + bare infinitive, have been omitted on the basis of their (very) infrequent usage and their less typical modal status, i.e. inter alia the possibility to construct them as both main verbs and auxiliaries. (*Had) better*, even though sometimes considered a semi-modal or emergent modal (see e.g. Leech et al. 2009 or Smith & Leech 2013), is not included either; compared to the other semi-modals, its functionality is much more limited.

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[27] The present study will not provide a critical discussion on possible functional divisions of modal meanings. This has been done exhaustively in, for example, Depraetere & Reed (2006). Instead, I will simply adopt Coates' view here from her (1983) corpus-based framework.

[28] I am aware that the issue described in (iv) oversimplifies the problem of interchangeability, as the semantic relatedness between modals and semi-modals is a highly controversial subject that typically requires a close analysis of semantic as well as socio-pragmatic factors.

3.4 Methodology

As mentioned above, the advantages of both COHA and COCA stand out. With over 400 million words each, a covered time span from 1810 to 2009 with decadal data points in COHA and from 1990 to 2012 with five-year data points in COCA, a register-balanced structure, and open access, the BYU-corpora provide a (statistically) solid database for researching different variables in AmE. This supplementary bulk of (new) data, i.e. over 13 million entries in absolute numbers for modals and semi-modals over two centuries combined, certainly facilitates further analyses on the subject of modality in a number of different ways. In this section, I will briefly describe the procedure adopted for this study to obtain the data from COHA and COCA. For the sake of comparability, my overall selection of modals and semi-modals is for the most part congruent with Leech et al. (2009) and Leech (2011). It must be noted that Leech's (2011) data on modal development over the 20th century in AmE are replicated here using the method explained below. Given that Leech does not describe his methodology in detail, the minor discrepancies in the frequency counts between his data (2011: 553) and the data presented in Table A3 in this study are suspected to be due to differences in the respective procedures employed. While the numbers do not differ too greatly, reproducing the data for the 20th century was nevertheless deemed a necessary step in order to maintain procedural consistency with regard to the new data on modal/semi-modal variation and change over the 19th century, which the present study contributes. The data from the 19th and 20th century can thus be compared more accurately.

To reduce the problem of precision the search queries were run by using POS-tags whenever possible. In the case of the modals, this process was rather straightforward, as the CLAWS 7 tagset (C7) used for tagging the BYU-corpora includes a separate tag for modals, i.e. 'VM'. Generating the data for the semi-modals, on the other hand, presents a few more complications in terms of accuracy and ambiguity, due to their multi-word structure. Next to searching for the most basic, inflected forms of the respective semi-modals (e.g. *wants to*, *being able to*, *had to*), additional queries were run to reduce the problem of recall by accounting for different syntactic variations, i.e. negation (see

example 10a below), adverb insertion (10b), negation + adverb insertion (10c), and inversion (10d).[29]

(10) a.   Since dating **is not supposed to** include emotional involvement, how can this be explained? [COHA, NF, 1952]

     b.   He **was always allowed to** come to the table, because he was an only child; and of course he could not fail to hear his father's eulogies on the good effect of a   glass of brandy and water after dinner. [COHA, FIC, 1835]

     c.   Yes, but it's not perfect. Intelligence **is not necessarily going to** prevent every attack. [COCA, SPOK, 2006]

     d.   By reason of the cessation of the bombardment at night, **were you not able to** rest and recruit your garrison? [COHA, MAG, 1871]

An overview of the search strings that were used for obtaining the frequencies of modals and semi-modals from COHA and COCA is provided in Table 3.2 below. Cliticized and phonetically reduced forms (e.g. *can't*, *she's going to*, *wanna*) are included in the analyses.

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[29] Examples obtained from COHA/COCA are cited with the respective corpus, register abbreviation and year of publishing — fiction (FIC), newspapers (NEWS), magazines (MAG), non-fiction books (NF), spoken (SPOK).

Table 3.2. Search string syntax for obtaining frequencies of modals and semi-modals in COHA and COCA[i]

modal expression	main search string	additional strings
can, *will*, *must* etc.	[vm*]	
BE *able to*	[vb*]_able_[to*]	[vb*]_*_able_[to*]
		[vb*]_[xx*]_*_able_[to*]
		[vb*]_*_[xx*]_able_[to*]
BE *allowed to*	[vb*]_allowed_[to*]	[vb*]_*_allowed_[to*]
		[vb*]_[xx*]_*_allowed_[to*]
		[vb*]_*_[xx*]_allowed_[to*]
BE *going to*, *gonna*	[vb*]_going_[to*]	[vb*]_*_going_[to*]
		[vb*]_[xx*]_*_going_[to*]
		[vb*]_*_[xx*]_going_[to*]
		goin_'_[to*]
		gon_na
BE *supposed to*	[vb*]_supposed_[to*]	[vb*]_*_supposed_[to*]
		[vb*]_[xx*]_*_supposed_[to*]
		[vb*]_*_[xx*]_supposed_[to*]
HAVE *to*	[vh*]_[to*]	havin_'_[to*]
(HAVE) *got to*, *gotta*	got_[to*]	
WANT *to*, *wanna*	[want].[v*]_[to*]	wantin_'_[to*]
		wan_na
NEED *to*	[need].[v*]_[to*]	
BE *to*	[y*]_[p*]_[vb*]_[to*][ii]	[y*]_[n*]_[vb*]_[to*]

[i] The web-interface's query syntax requires a space between every slot within a search string in order to recognize distinct words and punctuation, which is indicated here by an underscore.

[ii] Due its formal ambiguity, the syntactic environment for BE *to* had to be confined to a large extent, limiting its occurrence to the second position within any given clause that is preceded by a punctuation mark. As a result, its overall numbers are relatively low and the comparability with the other semi-modals appears to be diminished. However, the proposed search string setup has proven helpful to disambiguate the search results to large extent, as it automatically excludes numerous cases that display non-semi-modal usage of BE + *to* in succeeding positions, which may otherwise only be tested manually, see the example in (11).

(11)   You guys even followed leads from psychics? That's how desperate you **were to** find this girl. [COCA, SPOK, 2009]

In (11), *were* and *to* do not form a conceptual unit. Here, the infinitive marker introduces a non-finite clause (*to find this girl*).

Subsequent to the search queries, the raw data (i.e. absolute tokens) were exported from the web-interface into a self-designed calculation matrix that generates both the standardized, register-specific frequencies (based on the respective sub-corpora compositions of COHA and COCA, see http://corpus.byu.edu/) and the log-likelihood values. The form of the log-likelihood (LL) used here conforms to the one used by Paul Rayson's calculator at UCREL.[30] Accordingly, four different levels of significance can be distinguished, see Table A1. Note that LL values do not account for 'practical' significance, i.e. representativeness, homogeneity within the corpora, and comparability

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[30] See http://ucrel.lancs.ac.uk/llwizard.html.

of the corpora (cf. Rayson et al. 2004: 926). In this regard, the data up to the 1870s in COHA are less reliable compared to the other decades. The 1810s and 1820s have been omitted altogether from the present study.

In the next section, the results of the analyses on modal/semi-modal variation and change over the past two centuries will be discussed. Issues to be addressed are (i) the long-term developments, (ii) the consideration of overall as opposed to individual frequency distributions and shifts, and (iii) the competition between specific modals and semi-modals.

3.5 Results

The results presented in the following are discussed in the light of the previous research findings mentioned in Section 3.2. Diverging evidence will be emphasized. Note that the graphic illustrations provided here correspond to the respective tables in the Appendix. All frequencies are normalized (pmw).

3.5.1 The overall modal development in AmE

A comparative analysis of the data from BROWN and COHA is an instructive step, as it reveals some interesting aspects regarding the diachrony of modals in AmE. Figure 3.2 presents a summary of the overall normalized frequency shifts of modals per decade in COHA from 1830 to 2009 compared to their development observed by Mair (2015) over the three data points in BROWN.[31]

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[31] Note that the selection of modals in BROWN, as proposed in Leech (2003) and Mair (2015), has been adjusted according to the one presented in Section 3.3 of this study, which means that *ought (to)* and *need(n't)* + bare infinitive are omitted. Since these marginal modals occur rather infrequently in AmE, the overall development is not significantly affected by this approach.
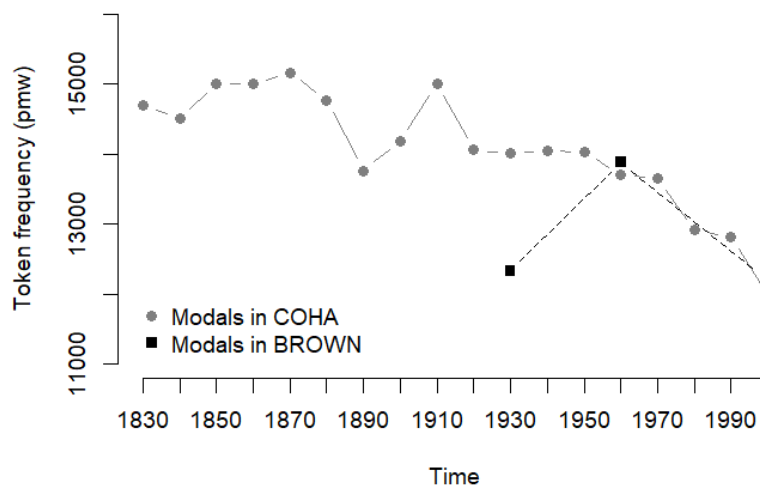
Figure 3.2. The overall frequency distribution of the modals in COHA (based on Tables A2, A3 and A4) and BROWN (based on Mair 2015: 131)

The trajectory representing the COHA data (black curve) indicates a significant [****]18.4% decrease in the use of modals as a whole since the 1830s. This development, however, is not gradual. While the downwards trend in modal usage is undeniable after the 1910s with even an accelerated decrease from the 1950s onwards (cf. Leech 2011: 553), the period between the 1830s and the 1910s is marked by some fluctuations. From the 1830s to the 1890s, the modals shows a relatively small but significant [****]6.3% decrease in their frequency largely due to a [****]9.2% dip between 1870 and the 1890s, which is followed by a [****]9.0% increase until the 1910s. Given such a long-term perspective, these temporary fluctuations are not too surprising, but any generalizations regarding the overall modal decline are thus somewhat impaired. A closer look at modal development in different registers shows that the overall frequency distributions are particularly uneven in non-fiction books (NON-FICTION) and newspaper articles (NEWS) prior to the 1930s, see Figure 3.3.
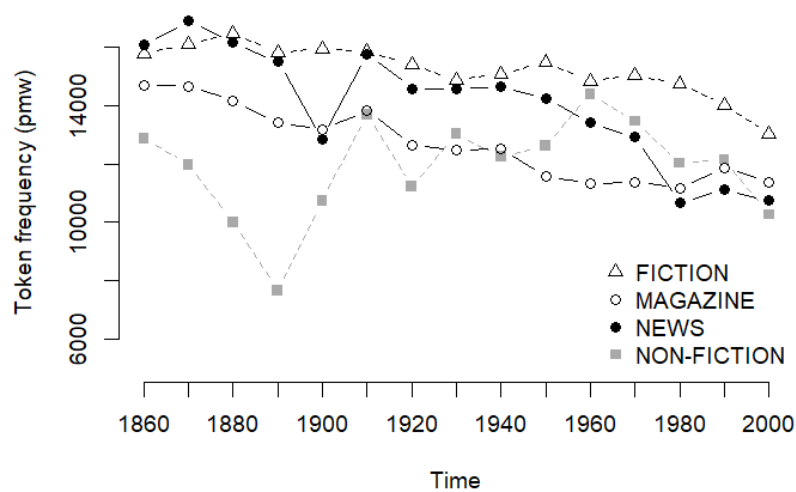
Figure 3.3. Overall modal development across different registers in COHA, 1860s–2000s (based on Table A5)

Despite the fact that all registers record a general decline in the use of modals when comparing the 1860s and 2000s, the frequency distribution of the modals in NON-FICTION (grey curve) is characterized by an extremely fluctuating progression, which may be largely due to the heterogeneity of that particular section, i.e. different text types and text selection. This can be substantiated with the data for individual modal development in that register, as nearly all of them follow the same trend between the 1860s and the 1910s thus accounting for the distinct V-shape progression over that period, see Figure 3.4.
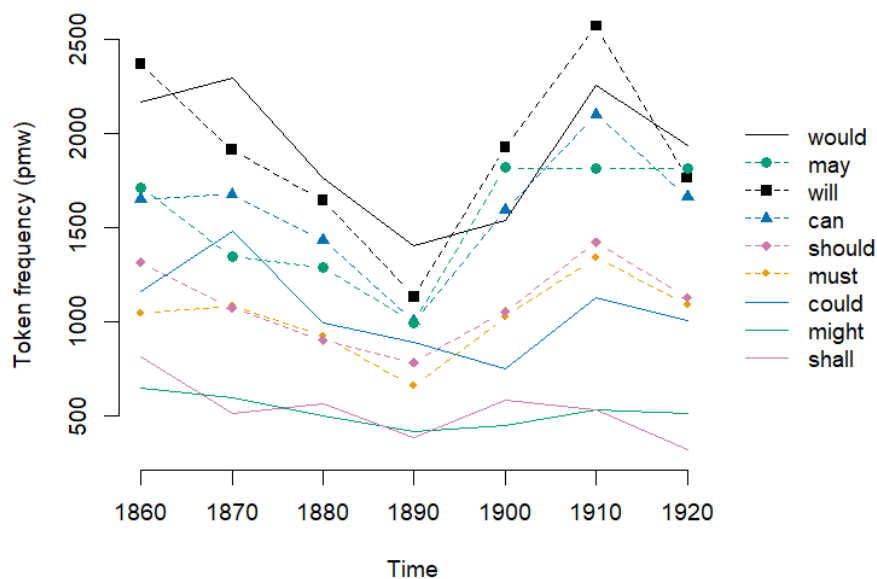
Figure 3.4. Individual modal developments in non-fiction books (NON-FICTION), COHA, 1860s–1920s (based on Table A6)

It seems rather unlikely that natural language change or change in stylistic conventions alone could explain such a conspicuous development, but without a more in-depth analysis of the respective text types as well as the text selection, this is somewhat speculative.

Apart from this supposed internal imbalance in COHA, a comparison between Mair's (2015) observations in BROWN (black curve in Figure 3.2) and the COHA data (grey curve in Figure 3.2) also deserves further consideration. According to his data, modals are insignificantly less used in Frown than they are in B-Brown, i.e. the increase from B-Brown to Brown is a little more than evened-out in Frown, which clearly results in divergent trends (cf. 2015: 131–132 and Table A3 this study). Although COHA and BROWN show nearly identical frequency distributions in the 1960s and 1990s, modal usage is 13.6% higher in COHA than in BROWN in the 1930s. As can be seen, the decades around the 1930s are characterized by stability in COHA. Due to fact that the frequency distribution of modals in BROWN and COHA are nearly identical for the 1960s and 1990s, it is certainly difficult to determine which data are more reliable. While Mair (2015: 140) correctly notes that the chances of observing statistical outliers increase when a dataset consists of shorter intervals (e.g. COHA), it must be noted that the influence of a possible outlier on the overall results in a dataset with very few intervals (in this case, BROWN) is more significant. Whether the data from B-Brown are in line with

a more persistent trend or merely a statistical outlier can only be confirmed with additional data points. To offer some further tentative remarks on this particular problem — Biber's (2004) study on modals in ARCHER (*A Representative Corpus of Historical English Registers*) supports the claim that their decline is a long-lasting trend dating back to the 1900s (at least), which is consistent with the findings in COHA. Furthermore, Mair's (2015) data indicate a small decline in modal usage from B-LOB (1931) to LOB (1961), a pattern that is also accounted for in Leech (2013). The additional data from B-LOB (1901) provided in Leech point to a rather stable frequency distribution from 1901 to 1961 in BrE, similar to the one found in COHA over the same period (cf. 2013: 99, 102). Now,

> [w]hile there is no necessity that a frequency trend in AmE should follow the same path as a frequency trend in BrE, previous research […] shows that such parallel changes are much more common than changes in which the two varieties diverge. (Leech 2011: 552)

Even though this evidence looks perhaps compelling, two things must be considered. First, expecting parallel developments over both national standard varieties, despite being common, is problematic, since differential change in BrE and AmE has been shown and discussed in, for example, Hundt & Dose (2012) and Mair (2014). Although their studies provide evidence of divergent trends in the use of the progressive passive and the development of the semi-modal (HAVE) *got to*, respectively, it seems plausible to also consider a possible divergence in the use of modals in both varieties. And secondly, it should also be noted that the problem of large(r) chronological gaps found in BROWN is even more acute in the case of ARCHER, which offers data points per 50-100 years with less data that may also represent statistical outliers. This issue is certainly reduced in COHA, as the distinctly larger amount of data is more likely to level statistical distortion. Additional releases of AmE components in BROWN or other historical resources of AmE data could help to resolve this issue.

3.5.2 Distinct diachronic patterns of individual modals

It was mentioned in Section 3.2 that the bottom weighting of the frequency loss observed in Leech (2003, 2011, 2013) and Leech et al. (2009) is flawed. The conclusion drawn from this pattern hinges on the presupposition that modals may be grouped according to their frequency distribution into high-frequency and low-frequency modals, as illustrated

in Figure 3.1. Figure 3.5, on the other hand, indicates that the development of individual modals challenges Leech's approach.
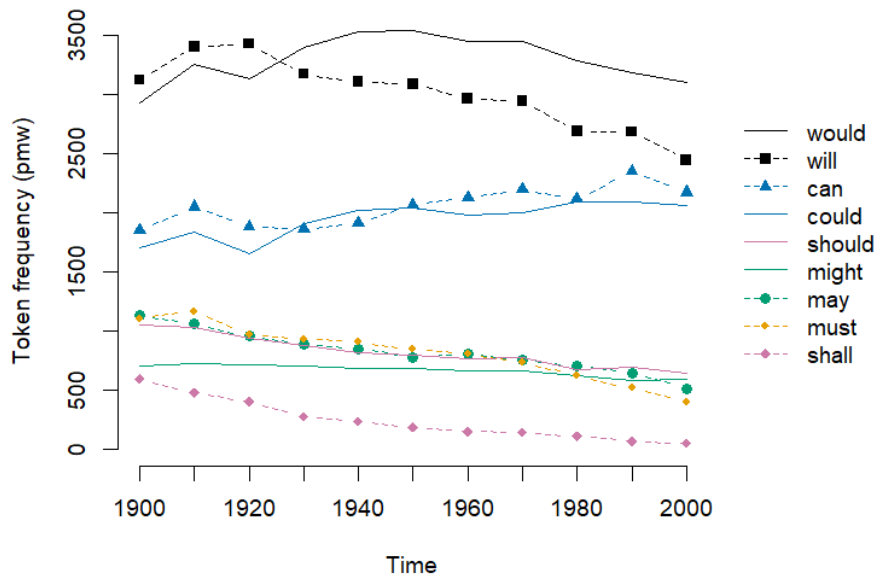
Figure 3.5. Frequency shifts of individual modals from 1900 to 2009 in COHA (based on Table A3)

The evidence presented here suggests that the high-frequency modals (*will*, *would*, *can*, *could*) are historically not a homogenous group and analyzing them as such conceals the facts that (i) up to the 1950s *can* and *could* cannot be clearly affiliated with either the frequent or the infrequent modals, and (ii) that the decline in the frequency of *will* over the 20th century is responsible for the second highest contribution (after *must*) to the overall modal decrease.

Starting from the 2000s, an argument can be made in favor of the approach that differentiates between the most common and least common modals. A backwards shift in time, however, clearly shows that the modals, if anything, split into three groups, given that the curve progressions for the modals at the top of the frequency list are obviously marked by divergent trends. *Can* and *could*, as opposed to *will* and *would*, show rather steady and significant increases in their use over the course of the century by [****]17.2% and [****]21.2% respectively. The increase in the use of *would* amounts to [****]6.2% from the 1900s to the 2000s, yet the modal progresses in a way that results in a somewhat flattened bell curve, showing an increase from the 1900s to its peak in the 1950s, before eventually decreasing again.

The development of *will* is particularly interesting. According to the COHA data, its demise over the 20th century is as much as [****]21.7%. The drastic downwards trend after the 1920s leads to a change in the frequency ranking, with *will* no longer being at the top of the list. More importantly, the development of *will* suggests that the claim of a bottom weighting of the frequency loss in the use of the modals cannot be maintained. This deserves further explanation. First, it should be noted that the lower frequency modals (*should*, *might*, *may*, *must*, *shall*) are decreasing without exception, but this change manifests at different rates (e.g. *might*: [****]16.1%; *shall*: [****]91.1%). In terms of relative change (i.e. percentage change from the 1900s to the 2000s), these modals record the highest frequency losses (see Table A3); but these figures overestimate their actual share in the overall decline. In terms of token losses (pmw), *must* (707) and the high-frequency modal *will* (676) lead the way, accounting for 23.1% and 22.1%, respectively, of the absolute decline; by contrast, low-frequency modals, such as *might*, *should* and *shall* merely contribute 3.7%, 13.1% and 17.7%, respectively.

It thus becomes apparent that the tendency of the four most common modals to collectively hold their own over the course of the 20th century, as proposed by e.g. Leech (2011: 556) or Leech (2013: 103), neglects this group's underlying heterogeneity. Leech's (2003) and Mair's (2015) data on individual modal developments in BROWN show a quite similar picture, see Figure 3.6.
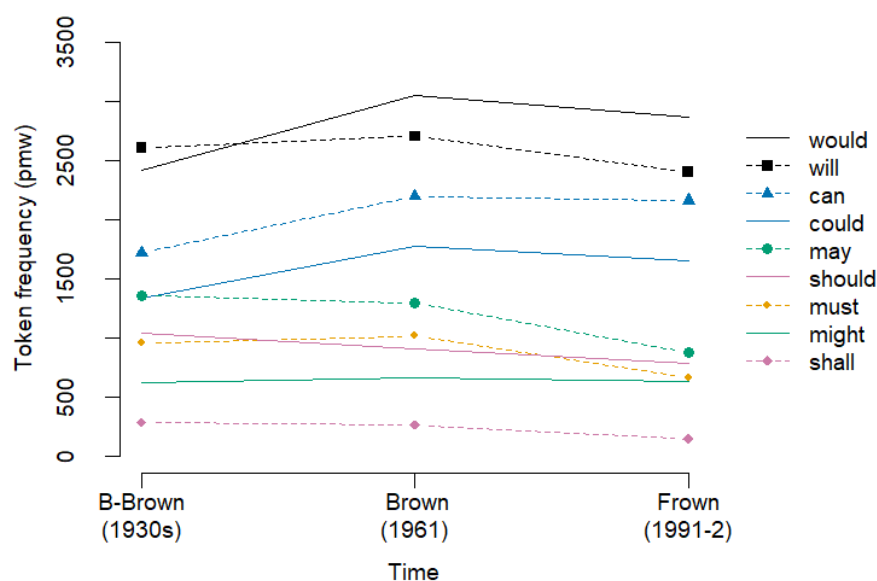
Figure 3.6. Frequency shifts of individual modals in BROWN (based on Mair 2015: 131)

Again, the four most common modals do not seem to develop alike. While *can* and *could* show significant increases in their use from B-Brown to Frown (****25.7% and ****24.3% respectively), the frequency of *will* is declining by **7.8% (cf. Mair 2015: 131). Parallel to their development in COHA (1900s–2000s), *can* and *could* take an intermediate position in Brown. In B-Brown, both modals appear to be more closely affiliated with the lower frequency cases, with *could* even undercutting *may* regarding their frequency distribution. This development is mirrored in COHA (1830s–2000s) in a similar fashion but with a considerable time gap, as the trajectories for *could* and *may* converge roughly 90 years earlier, see Figure 3.7.
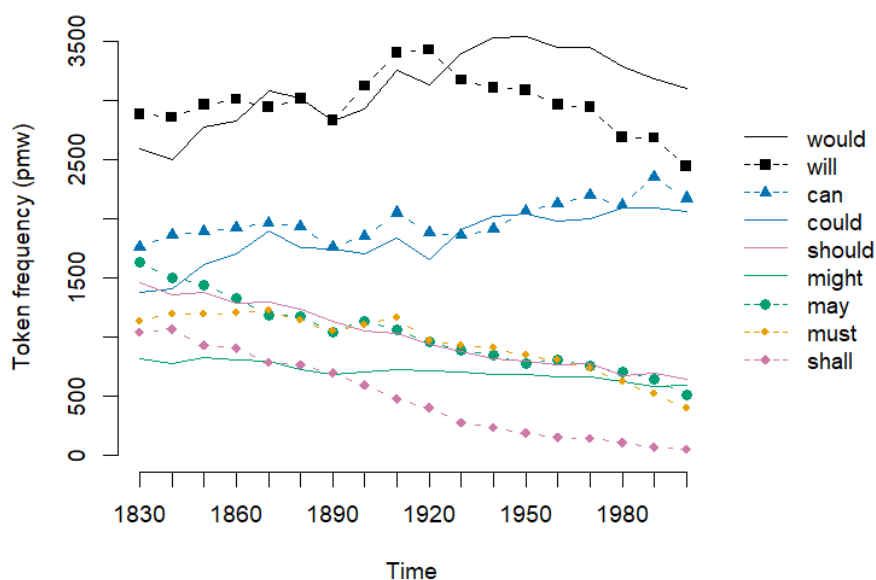
Figure 3.7. Frequency shifts of individual modals from 1830 to 2009 in COHA (based on Tables A2, A3 and A4)

As shown in Figures 3.5, 3.6 and 3.7, the tendency for less frequent modals to become more marginalized, as suggested in Leech (2003, 2011, 2013) can be confirmed for the most part. The data from BROWN and COHA indicate that *shall*, *should* and *may* (apart from its single ****8.6% increase between the 1890s and 1900s) have been decreasing significantly in their frequency all along, see Tables A2, A3 and A4. The development of *might* appears to be a stable but more moderate decline from the 1830s to 2000s, as the ****27.1% decrease over this period only amounts to 5.1% (or 3.7% from 1900 to 2009) of the overall losses. *Must* behaves differently still. From the 1830s to the 1910s, the modal

appears to be quite stable. Its rather famous, dramatic decline in usage only begins afterwards, with an accelerated frequency loss from the 1950s onwards, similar to its decreasing use from Brown to Frown.

In sum, the data from COHA and BROWN substantiate the claim that, from a historical perspective, the four most common modals do not behave consistently. Leech's (2003, 2011, 2013) dichotomous approach, i.e. the classification of modals into frequent and infrequent ones, is only plausible when considering the frequency distribution of modals in the late 20th and early 21st century. Apart from that, both COHA and BROWN provide sufficient evidence against this approach.

3.5.3 The rise of the semi-modals

Figure 3.8 shows the diachrony of semi-modals in AmE. As with the modals, the bulk of studies concerning the development of semi-modals are usually based on data from BROWN. To my knowledge, the latest contribution that provides extensive coverage on the development of semi-modals from B-Brown to Frown is Mair (2015). With the exception of BE *to*, his data indicate a general increase in the use of semi-modals in written AmE between the 1930s and 1991; however, individual developments are quite heterogeneous in terms of relative frequency changes, with, for example, BE *able to* exhibiting a rather moderate increase it its use over the 60-year period, while NEED *to* increases more than four-fold (cf. Mair 2015: 137). Using both COHA and COCA, the present study provides data on very recent developments in the use of semi-modals in both written and spoken AmE and also traces the frequency shifts back to the 1830s. As noted earlier, the selection of semi-modals discussed in Section 3.3 may vary considerably depending on the respective research. Here, the selection is mainly guided by the (potential) semantic and syntactic competition with respect to the modals.
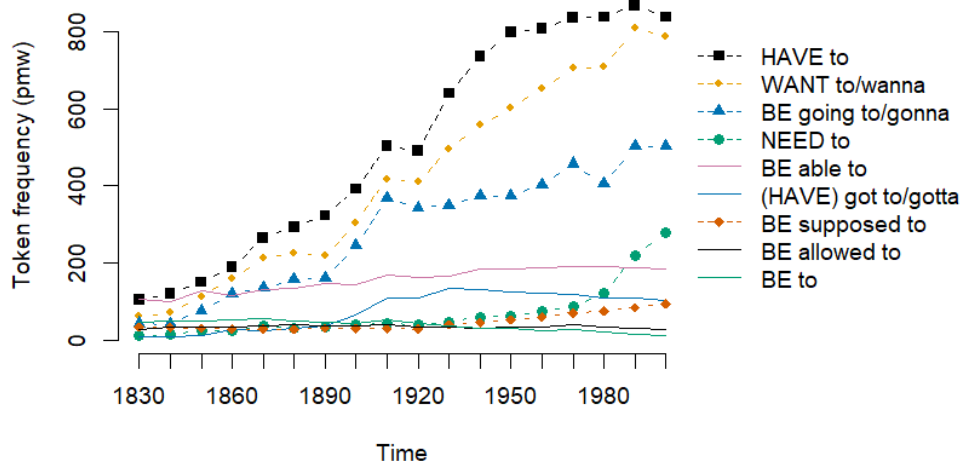
Figure 3.8. The frequency shifts of selected semi-modals from 1830 to 2009 in COHA (based on Tables A7, A8 and A9)

According to the COHA data, the semi-modals show a significant five-fold increase in their overall use between 1830 and 2009. Apparently, the general upwards trend in the frequency distribution splits into two main intervals (****1830s–1910s and ****1920s–1970s) delimited by two temporal setbacks (****1910s–1920s and *1970s–1980s).

The 1830s to the 1840s seem to be crucial for determining the beginning of the notable overall rise of the semi-modals, as this period is characterized by a rather moderate **5.6% increase in semi-modal usage, followed by several decades of significantly higher increases. The clinched picture of the individual frequency distributions in the 1830s further supports this claim. Only after the 1840s, three outliers, namely HAVE *to*, WANT *to* and BE *going to*, start to seriously establish themselves at the top of the frequency list, which also indicates that the overall increase in the use of semi-modals in general mostly hinges on these few members. Furthermore, it is obvious that HAVE *to*, WANT *to* and BE *going to* show parallel developments up to the 1920s. The respective patterns seem too similar to be accounted for by chance rather than synergy effects. Interestingly, from the 1930s onwards, BE *going to* clearly slows down in its increase, while HAVE *to* and WANT *to* keep rising in their previous fashion. In light of the significant decrease in the use of *will* discussed early in this paper, the development of BE *going to* will receive further attention in Section 3.5.4.

A closer look at the overall increase in terms of tokens (pmw) indicates that the 20th century is more productive than the 19th century in helping the semi-modals rise to

prominence. A noteworthy case along the lines of this process is NEED *to*. Although this semi-modal is still being used significantly less in the 2000s than HAVE *to*, WANT *to* and BE *going to*, its frequency has more than tripled between the 1970s and the 2000s, eventually overtaking (HAVE) *got to* and BE *able to* in the 1980s and 1990s respectively for the fourth place on the frequency list. An intriguing explanation for this remarkable increase, which is accompanied by a decrease in the use of *must*, is the so-called *democratization trend*, i.e. the avoidance of overt markers of authority in utterances conveying a directive (see e.g. Myhill 1995; Smith 2003; Leech et al. 2009). Furthermore, Mair notes that

> [such] drastic increases in a very short period reflect the dynamic phase of ongoing grammaticalisation, in which semantic bleaching, the increasing conventionalisation of new grammatical patterns and their spread throughout all registers and text-types conspire to boost corpus frequencies. By comparison, [BE] *going to* and [HAVE] *to* represent mature instances of grammaticalisation […] still spreading forcefully in written English in the present. (2015: 136)

NEED *to* has apparently reached the phase of grammaticalization which HAVE *to*, WANT *to* and BE *going to* went through about 100 years earlier, given the similarity in the respective trajectories marked by a major initial increase.

Despite some (negligible) numerical discrepancies in the standardized frequencies, the observations regarding the general increase in the use of semi-modals in COHA between the 1930s and 1990s are for the most part in line with Mair's (2015) findings in BROWN. By contrast, there is a clear divergence in the development of (HAVE) *got to* across both databases. According to Mair (2015: 137), (HAVE) *got to* records a 44.4% increase in its frequency from B-Brown to Frown, whereas the semi-modal shows a ****18.4% decrease over the same period in COHA. A similar decline (although restricted to specific text types, namely American plays and Drama&Movies) is also reported in Jankowski (2004: 95) and Lorenz (2013a: 122–123). While this might be worth exploring further, the trend observable for (HAVE) *got to* in BROWN should perhaps not be overestimated. As Mair notes, "the frequencies [of (HAVE) *got to*] are moderate throughout [and] statistically significant patterning is absent in the data" (2015: 139).

Finally, as mentioned in Section 3.2, the semi-modals are still being used significantly less than the modals in PDE. With a ratio of 4.2:1 (modals to semi-modal) in the 2000s (COHA), this circumstance is not likely to change any time soon in written AmE. Seeing that both modals and semi-modals are more common in spoken than in

written English (see e.g. Biber et al. 1999; Biber 2004), the obvious next step is to turn to COCA for additional data. It is expected that the COCA findings will confirm the evidence regarding a considerably less dramatic distributional modal/semi-modal gap in spoken English, as proposed by e.g Mair & Leech 2006 and Leech et al. 2009 on the basis of significantly smaller corpora, such as *The Longman Corpus of Spoken American English* (LCSAE). Figure 3.9 presents the respective overall frequency distributions of modals and semi-modals in the spoken register of COCA.
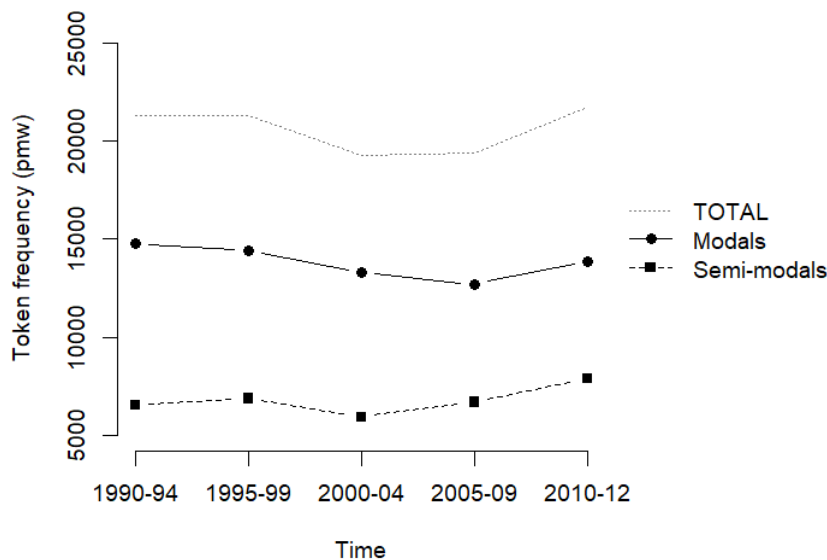
Figure 3.9. Frequency distribution of modals and semi-modals in COCA (SPOKEN) (based on Tables A10 and A11)

Two conclusions can be drawn from the evidence provided in Figure 3.9 — (i) based on COCA's spoken register, the modal/semi-modal ratio has improved considerably in favor of the semi-modals (1.7:1 modals per semi-modal in 2010–12); and (ii) the trajectory for the combined frequencies of modals and semi-modals (green curve) indicate that the respective trends eventually compensate for previous losses. In contrast, the data from the written components of COCA signal a moderate, but highly significant decline in the combined frequencies by [****]3.2% from 1990 to 2012, see Tables A12 and A13. Yet, it seems too rash to speak of a general 'modal deficit' in this case, as proposed by Leech (2013: 106–107), without having considered data from COHA or COCA on any other

means of expressing modality besides modals and semi-modals, such as modal adverbs (a), (mandative) subjunctives (b), or *modal periphrases* (c), see the examples in (12).[32]

(12) a. One strain in her character that our divorce has touched is that she is **possibly** less resilient than she has been before in her life, and worry about getting older is proof of it. [COHA, FIC, 1986]

  b. Turney is suspended on an unrelated incident; influential African-American ministers **demand** that he **be** taken off the streets. [COHA, NEWS, 2004]

  c. Participants almost always **consider it more probable that** the woman is both a bank teller and an activist in the feminist movement than that the woman is simply a bank teller. [COHA, MAG, 1995]

I will, however, discuss this deficit in regard to the modal/semi-modal pair *will*/BE *going to* in the following section.

3.5.4 The case of *will* versus BE *going to*

In contrast to HAVE *to*, which has overtaken its modal counterpart *must* in both spoken and written AmE, BE *going to* is still lagging behind *will*, especially in written AmE. While it is generally accepted that *will* is formally a modal verb, it may be debatable whether its main function as a future tense marker falls within the domain of modality, given the traditional distinction between the categories MODALITY and TENSE. However, reference works on English grammar in general (e.g. Quirk et al. 1985; Bybee et al. 1994; Biber et al. 1999; Huddleston and Pullum 2002) as well as numerous studies on modality in particular (e.g. Lyons 1977; Coates 1983; Bybee et al. 1991; Krug 2000; Palmer 2001; Leech 2004a; Collins 2009) have adopted the approach of treating the future time reference (of *will* and BE *going to*) as another modal function, as they are "so closely intermingled that it is difficult to separate them" (Leech 2004a: 56). Given that "futurity always involves an element of doubt or uncertainty, it inevitably overlaps with modality" (Coates 1983: 169). Consequently, the following analysis of *will* and BE *going to* in both COHA and COCA is based on the view that their functional meanings (root > 'willingness, intention'; epistemic > 'prediction, predictability') are all closely related to the concept of futurity (cf. Coates 1983: 169–204).

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[32] The term *modal periphrases* is adopted from Kranich & Gast (2015) and describes ad hoc formations that use lexical markers of modality.

Due to its development over the past century, *will* certainly demands further attention, as the significant decline in the use of this particular modal raises questions regarding a possible overall change in referring to future time.[33] In this respect, arguably, the first candidate one would think of is BE *going to* and whether the increase in its use, although being itself still seriously outnumbered by *will* in present-day AmE, is capable of compensating for the modal's declining frequency. To illustrate the issue, the respective developments of *will* and BE *going to* in COHA from 1910 to 2009 are shown in Figure 3.10.
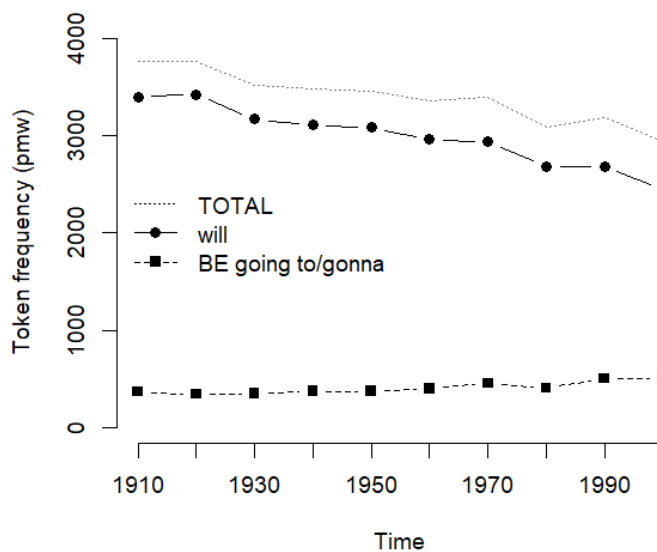
Figure 3.10. The converging frequency shifts of *will* and BE *going to* from 1910 to 2009 in COHA (based on Tables A3 and A8)

The overall deficit caused by the combined frequencies of *will* and BE *going to* from 1910 to 2009 is ****21.8%. Three questions instantly arise — (i) how conclusive is the ratio of the frequencies of the two future tense markers in describing an actual deficit; (ii) to what extent can this trend be observed in spoken AmE; and (iii) what is the role of other means of referring to future time in English? The evidence, although intriguing, undoubtedly

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[33] Note that in Section 3.5.4 *will* and BE *going to* are compared purely on the basis of their overall frequency distributions. This approach may rightfully be criticized for not explicitly accounting for the different senses associated with each expression besides future time reference. However, a comprehensive corpus study by Collins (2009) suggests that the relative distribution of the different senses, i.e. epistemic and root, within each expression is nearly identical. Admittedly, his results are based on synchronic data from considerably smaller corpora, which, of course poses problems regarding the comparability with the diachronic data presented here. Nevertheless, this step is believed to be sufficient in lending the data some substance and providing a possible indication that the future tense system is being restructured.

merits in-depth research; however, within the scope of this study, I will only allude to some issues.

The first question insinuates that the relative change in the combined frequencies of *will* and BE *going to* may be a relatively unstable measure, as the development of *will* could just as well fall in line with a more general decline in the use of verbs in AmE as a whole, thus diminishing the significance of the 'future marker deficit'. To confirm whether the observation in Figure 3.10 is robust, this deficit was measured against the frequency distribution of verbs in general over the same period. The COHA data revealed that verbs remained quite stable from the 1910s to the 2000s in written AmE (+[*]0.2%), therefore indicating that the decline in the use of *will* is indeed significant. To shed light on whether the trend in Figure 3.10 is also observable for spoken AmE, the data from COCA must be reconsidered.
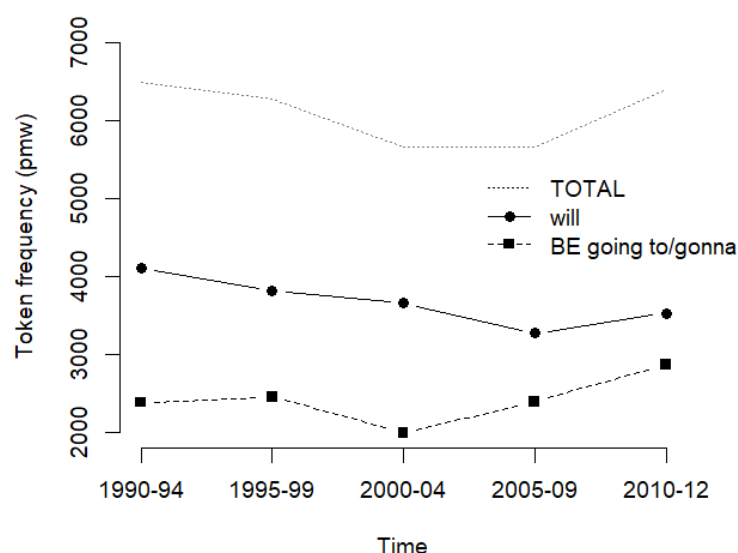
Figure 3.11. The frequency distributions of *will* and BE *going to* in COCA (SPOKEN) (based on Tables A10 and A11)

As shown in Figure 3.11, no deficit can be detected. By 2010–12, BE *going to* has nearly caught up with *will* in spoken AmE. The significant [****]43.7% increase in the use of BE *going to* from 2000 to 2012 suggest that the underlying grammaticalization process continues to thrive, making the semi-modal a serious competitor of *will* in the spoken register: see Szmrecsanyi (2003) for a similar observation in the *Santa Barbara Corpus of Spoken American English* (CSAE). A tentative explanation why this trend has not spread

in the same fashion in written texts is a possible time lag caused by two opposing factors, i.e. *colloquialization* and a 'prestige barrier' (cf. Leech 2013: 110–111). While colloquialization extends the use of semi-modals to written registers, it is slowed down by "the taboo that discourages the use of highly colloquial forms [such as *gonna* or *wanna*] in written (especially printed) texts" (Leech 2013: 110). Accordingly, the apparent deficit caused by *will* and BE *going to* in written AmE may eventually become smaller.

While it is tempting to assume that *will* and BE *going to*, as the main overt markers of future tense in English, are largely responsible for an overall change in the future tense system in written AmE, the evidence shown in Figure 3.10 cannot be fully explained without considering other expressions referring to future time, e.g. the progressive (which is generally increasing in its usage, see e.g. Hundt 2004; Leech et al. 2009) or non-predicative elements, such adverbs or complex noun phrases. A possible starting point for further research may be a closer analysis of potential future time adverbs (e.g. *tomorrow*, *soon*), simply because they are single word items and fairly easy to trace within a corpus. Other means, such as the futurate progressive or the futurate simple present, are far more complex. While traditional grammatical descriptions suggest that either requires a time adverbial to mark (remote) futurity (see e.g. Quirk et al. 1985; Palmer 1987; Leech 2004a), more recent corpus-based accounts indicate that at least the progressive increasingly expresses futurity without any specifying time adverbials in PDE (see e.g. Nesselhauf & Römer 2007; Nesselhauf 2011). For the futurate present, however, Hilpert (2008: 160) argues that cases which exhibit co-occurrence of present tense forms and future time adverbials encode future time reference unambiguously. Consequently, a quantitative analysis of future time adverbials would include some cases of the futurate simple present (and arguably cases of the futurate progressive) and might therefore be a good starting point altogether. Yet, this debate certainly leads away from modals and semi-modals, which are the focus of this study.

3.6 Conclusion and outlook

My investigation has provided new and refined data on the diachrony of modals and semi-modals obtained from two sizable corpora of AmE, i.e. COHA and COCA. It has been shown that modals in general have been significantly decreasing in written texts since the 1830s. While this trend seems irrefutable from the 1950s onwards, the evidence

is certainly less conclusive for the 19th and early 20th century, given the significant fluctuations in the overall frequency shift over the course of this period. Furthermore, the diachronic analysis of individual modal developments has revealed that the high-frequency modals (*would*, *will*, *can*, *could*) are not behaving homogenously at all and that their declared stability as a group proves to be misleading. As opposed to *can* and *could*, which record significant increases in their use, the demise of *will* is eventually responsible for more than one-fifth of the overall losses of the modals, placing it right behind *must* as the 'biggest losers' over the course the 20th century.

Contrary to the overall development of modals in AmE, a selected group of semi-modals shows tremendous increases in its frequency, indicating an ongoing exemplary process of grammaticalization. Again, the importance of considering individual developments has been demonstrated, as the semi-modals clearly emerge at different rates. In this regard, the 1840s/1850s apparently mark the beginning of their rise, especially the most advanced members of this category, namely HAVE *to*, WANT *to* and BE *going to*. A noteworthy case of a more recent emergence is undoubtedly NEED *to*, which has overtaken (HAVE) *got to* and BE *able to* for the fourth place on the frequency list by the late 20th century. However, despite these developments, it must be noted that the semi-modals are still seriously outnumbered by the modals in all registers. Although this picture is not nearly as dramatic in spoken AmE, where the semi-modals seem to (at least partially) catch up with their modal counterparts, actual modal displacement can thus far only be reported for an isolated case, i.e. HAVE *to* and *must*.

The competition between modals and semi-modals (or the lack thereof) is nevertheless intriguing. In particular, my study has alluded to the peculiar case of *will* versus BE *going to*. The incapability of BE *going to* to even remotely compensate for the declining use of *will* in written AmE raises questions regarding a possible change in referring to future time. Of course, considering other means of marking future tense in English, such as the progressive or adverbs of time, this might not be the whole story.

Without doubt, modals and semi-modals have already received considerable and thorough attention — but it would be misleading to claim that there is hardly any research left to be done. The amount of additional quantitative data presented here alone facilitates further analyses in this field, quantitative as well as qualitative. Most importantly, a closer look at new resources allows for new evidence to be discovered.

4 Contractions, constructions and constructional change: Investigating the constructionhood of English modal contractions from a diachronic perspective

The article in this chapter is the author accepted manuscript of the study that has been published as:

Please quote from the original publication.

Abstract

In this paper, I argue that construction grammarians may have to consider integrating modal contractions into the English modal system as distinct constructions rather than variants of their uncontracted forms. Based on data from COHA, it can be shown that the contractions investigated here have emancipated themselves from the full forms both in terms of relative usage frequency as well as function over the past two centuries, thus yielding a series of constructional changes. From a usage-based, constructionist perspective, these results contribute to modelling the modal network as possibly represented in the minds of speakers, but they also support the understanding that this network appears to be much more heterogeneous than perhaps desired (by some linguists).

4.1 Introduction

The English core modals (e.g. *will*, *can*, *may*) represent a rather well-defined verbal category with distinct morphosyntactic properties (Huddleston 1980; Quirk et al. 1985: 135–137), of which their ability to have contracted forms (e.g. *'ll*, *can't*) serves as the starting point for the present paper. It is firmly established in the literature that these contractions are an exemplary case of later stage grammaticalization (Givón 1979; Heine 1993; Hopper & Traugott 2003), having emerged through an increase in overall usage frequency of their full forms that eventually led to automatization and reduction (Bybee 2006, 2010). Unlike the full modals, which have received considerable attention from numerous perspectives, their contractions are hardly ever discussed as anything more than mere eroded colloquial variants. By contrast, only a handful of corpus-based studies have recognized differences between the contraction *'ll* and its corresponding full forms *will* and *shall* that go beyond purely formal criteria, relating to distributional changes (e.g. Axelsson 1998; Berglund 2005) and meaning (e.g. Nesselhauf 2010, 2014). As will be shown, *'ll* is not an isolated case, but its conspicuous behavior seems to be mirrored by other modal contractions and, what is more, it can be explained quite naturally from a constructionist perspective.

Over the last 20 years or so, Construction Grammar (CxG) has been engaging in various linguistic domains outside its traditional syntactic comfort zone (for an overview, see e.g. Hoffmann & Trousdale 2013), establishing itself as a fruitful approach to language as a whole.[34] Modality, on the other hand, despite having been studied from many different theoretical perspectives for decades, is still relatively underexplored within this framework. The modal system's underlying heterogeneity (both synchronic and diachronic) remains a challenge for constructionist approaches, as it is yet to be agreed upon how modal meanings can be adequately described and how modal constructions and their meanings emerge and change over time. These issues are inherently tied to an understanding of what actually constitutes a modal construction and, accordingly, how many modal constructions can be identified. Especially the latter question will be addressed in this paper, as it has not yet been made explicit in the CxG literature how exactly the contracted forms of the modals fit in the modal network. In line with the principles of usage-based CxG (Croft 2001; Goldberg 2006), it will be argued

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[34] This term is somewhat misleading, as it suggests a single unified theory of Construction Grammar, which does not exist as such.

that modal contractions may be viewed as constructions (cxns) in their own right, that is, as entrenched form–meaning pairings (Croft & Cruse 2004; Langacker 2005; inter alia) that exhibit structural as well as functional idiosyncrasies and also occur with sufficient frequency (Goldberg 1995; Goldberg 2006).[35] Based on data obtained from the *Corpus of Historical American English* (COHA; Davies 2010), two main properties of three contracted English modals, namely *can't*, *won't* and *'d*, are investigated to underscore their status as cxns independent of their historically related full forms *cannot*, *will not* and *would*. The first property relates to the relative frequency distribution of contracted to uncontracted forms. There is a general consensus that the English modals continue to be in a phase of long-lasting change (Biber 2004; Daugs 2017; Hilpert 2008, 2012; Leech 2013; Mair 2015; Millar 2009). A closer look at developmental trends of contracted modals clearly indicates an increase in their relative usage frequency over the past 200 years up to the point where they either have already surpassed or are on the verge of surpassing their respective full forms, which suggests noteworthy changes in the constructional network (Hilpert 2013a: 17, 2013b: 461–463). This increase can be linked to a second property, which concerns the functional idiosyncrasies they appear to have developed since the early 19th century. Next to a preference for accompanying monosyllabic verb infinitives, the contractions have shifted towards specifically attracting cognitive and emotive verbs (e.g. *mind*, *like*, *believe*). Finally, a close semantic analysis reveals that each contraction, relative to its full form, has a distinctive preference for its own functional context (i.e. the type of modality expressed). In combination, the increase in relative frequency, the changes in the collostructional behavior as well as their function and the obvious formal differences between contracted and uncontracted forms underscore their status as cxns.

The paper is structured as follows. Section 4.2 provides a concise summary of how modal contractions have been dealt with in textbooks, grammars and corpus studies thus far. The claim that modal contractions are distinct cxns will then be fleshed out in Section 4.3 by focusing on their formal properties, distributional changes and collocational/ functional preferences. I will also briefly outline the methods employed for my investigation and justify the choice of corpus and genre used. Finally, in Section 4.4, the results from the corpus analyses are incorporated into a discussion on modal contractions

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[35] Note that neither Croft's nor Goldberg's versions of CxG are actually termed usage-based Construction Grammar, but *Radical Construction Grammar* and *Cognitive Construction Grammar* respectively. However, since both adhere strongly to the principles of usage-based linguistics (for a detailed discussion, see Diessel 2015), this term will be used instead.

and constructional changes. In sum, the findings are expected to contribute to modelling the complex network of modal expressions.

4.2 English modal verb contractions across textbooks, grammars and corpus-based studies

This section briefly rehearses the tenor in the literature regarding the relationship between modal verbs and their reduced forms before turning to the studies that specifically analyzed the distributional and functional behavior of selected modal contractions. Particular attention will be paid to Bergs (2008) and Nesselhauf (2014), who investigated *shan't* and *'ll* respectively from a constructionist perspective.

Academic textbooks on (modal) verbs or clitics typically treat English modal contractions as colloquial variants (Leech 2004a: 51, 80) that, "[i]n terms of their function and meaning, […] are essentially the same thing [as their respective full form]" (Spencer & Luís 2012: 1). This is also picked up in pedagogical grammars and usage guides, but with a more prescriptive tone that stresses the importance of limiting the use of contractions to speech or informal writing (see e.g. Foley & Hall 2012: 90; Swan 2005: 143). Descriptive grammars obviously dispense with imposing any such usage norms, but the corpus data presented in, for example, Biber et al. (1999: 1129–1132) clearly confirm a general preference for the use of (negative) verb contractions in conversation and fictional writing. Furthermore, these contractions need to be distinguished from phonological reductions that are not institutionalized in either speech or writing, such as vowel weakening in online speech production (Quirk et al. 1985: 123). In both Biber et al.'s and Quirk et al.'s grammars, the reduced forms of the modals, regardless of whether negative or non-negative, are recognized as enclitics with corresponding full forms. A different stance is taken by Zwicky & Pullum (1983) and Huddleston & Pullum (2002: 91), who consider the form *n't* a negative inflection rather than a clitic, thus suggesting that, for example, *won't* is a word-form of WILL and not the contracted form of *will not*.[36] The arguments made are that *won't* cannot be replaced by *will not* in inversion and that

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[36] Palmer (1990: 29) makes a similar suggestion, but also includes *would* and *wouldn't* in the paradigm of WILL.

the phonological relationship cannot be predicted by general rule.[37] Both of these points will be discussed in more detail in Section 4.3.1.

Many corpus-based studies that provide data on modal verbs follow the notion that contracted and full forms are functional equivalents and thus aggregate their frequency counts (Coates 1983; Collins 2009; Leech 2013; Leech et al. 2009; Smith 2005; to name but a few). From a methodological standpoint, this procedure is plausible, as all possible variants of a linguistic variable must be captured to avoid violating the principle of *(total) accountability* (Labov 1969; Leech 1992). The present paper acknowledges this method but proposes that the frequencies of these forms should not be combined because they do not simply represent different pronunciation variants of the same variable — to put it differently, it will be argued that the choice between *will not* and *won't* (and other corresponding pairs) is lexical rather than purely morphophonological in present-day English (PDE).

The few comprehensive studies that deliberately treat (negative) verb contractions individually report, among other things, on their general preference for co-occurring subject pronouns, particularly in the first and second person (Kjellmer 1997) and a noticeable increase in their use in the second half of the 20th century (Axelsson 1998; Millar 2009). In addition, Szmrecsanyi (2003) observes syntactic stratification showing that *won't* and *'ll* appear to be disfavored in syntactic dependent contexts compared to the full forms. Berglund (2005) also pays closer attention to the differences between *will* and *'ll* and further discovers slightly varying collocational patterns with regard to their most frequent infinitival collocates (based on raw frequencies). However, none of the studies mentioned above suggest any meaning differences between contracted and uncontracted forms. Nesselhauf (2010), on the other hand, explicitly advises some caution stating that "it is by no means clear whether *'ll* can be regarded merely as a contracted form of *will* or whether and to what degree it leads a life of its own" (Nesselhauf 2010: 170). This is followed up in Nesselhauf (2012), where she provides a close semantic analysis of *'ll* in comparison to *will* from a long-term diachronic perspective and argues that the contraction differs from its full form not only in terms of its distribution, but also its function. Based on two temporal data points selected from the British component in ARCHER 3.1 (i.e. 1750–1799 and 1950–1999), she shows that *will* has become more specialized in expressing what she labels 'pure prediction', whereas *'ll* has developed into

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[37] Conversely, Huddleston & Pullum (2002) treat enclitics, such as *'ll* and *'d*, as genuine contractions.

having two equally dominant senses in the second half of the 20th century, namely 'pure prediction' and 'intention' (Nesselhauf 2012: 95–97).

To my knowledge, there are only two studies that have thus far investigated modal verb contractions within a CxG framework. Bergs (2008) discusses the demise of *shall* and its related form *shan't* through functional condensation and suggests that both forms represent distinct, yet related cxns. Crucial to his argument are co-textual and contextual factors as part of the information stored in a cxn, that is, speakers' knowledge of *shall* and *shan't* includes knowledge of the syntactic environment and the register(s) they are commonly used or disfavored in. While *shall* only survives in legal and religious texts, interrogatives, ellipses (e.g. *Let's have a look, shall we?*) and in idioms with discourse-like function (e.g. *shall we say*), *shan't* is virtually non-existent in PDE, as it faces the dilemma of unifying two cxns with contrasting contextual information, namely the *shall* cxn, which is typically associated with formal styles, and the colloquial *n't* cxn (Bergs 2008: 134).[38] The present paper agrees that both *shall* and *shan't* represent separate cxns, but it refrains from positing a *n't* cxn, since the contracted negative particle, similar to bound morphemes and enclitics, does not occur in isolation (i.e. it is not independent) and can thus not constitute a holistic form–meaning pairing on its own (Booij 2010: 15). This, however, does not diminish Bergs' otherwise convincing argument regarding the functional tight spot of *shan't*, as one could postulate a cxn in the form of a semi-schematic template in which the *n't* particle is inextricably linked to an open (modal) auxiliary slot: [AUX-*n't*]. This cxn would contain the information 'informal', among other things, and, depending on which (modal) auxiliary occupies the open slot, it would either be readily acceptable and fairly frequent (e.g. *shouldn't*, *couldn't*) or functionally dubious and (therefore) severely marginalized (*shan't*, perhaps also *mayn't*). A shortcoming of this proposal is that *shall* would have to undergo a change in form to instantiate the [AUX-*n't*] cxn — from /ʃæl/ (or /ʃəl/) to /ʃæ/ (or /ʃɑː/ in BrE) — a process for which there appears to be no motivation, as the discussion in Section 4.3.1 will demonstrate. Rather than assuming an active unification of two cxns, it seems more likely that *shan't* is simply recognized as a distinct cxn and the functional dilemma proposed by Bergs arises through *shall* and a [X-*n't*]AUX cxn being activated simultaneously with *shan't* during retrieval, given their morphological and semantic relatedness (cf. e.g. Bertram et al. 2000; De Jong et al. 2000).

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[38] See also Hilpert (2013b) for the use of *shall* as a text-structuring device.

Finally, in her (2014) paper, Nesselhauf integrates her previous findings on *'ll* into a constructionist framework and argues that, due its distribution and function different from *will*, the reduced form may be regarded as a cxn. It is doubtful that *'ll* by itself instantiates a cxn (any more than *n't* does); rather, it represents the substantive element of a variable pattern that prototypically includes two schematic slots as well, one for a subject host and one for a following bare infinitive. Yet, this is more of a theoretical issue. In practice, the semantic analyses on which her conclusions rest clearly include the wider co-text of both *will* and *'ll*, as this is a necessary prerequisite for being able to identify their specific meanings in the first place. Thereby, she identifies the sense 'spontaneous decision' in her data, which appears to be much more commonly expressed by the cxn with *'ll* than *will* in present-day British English (Nesselhauf 2014: 85–86). Also, the reduced form has not only increased in its usage frequency in general since the Late Modern English period (LModE) but has spread from the speech-based register of drama to other more formal registers (Nesselhauf 2014: 80–82), a trend that is not idiosyncratic to *'ll*, but seems to hold true to some degree for other contracted modals, too (see Sections 4.3 and 4.4).

4.3   The constructionhood of modal contractions: three case studies

CxGs are rather consistent when it comes to one specific defining aspect of a cxn, namely that it exhibits some kind of idiosyncratic behavior, that is, it cannot be predicted by general rule and must therefore be learned. This may either concern its form pole (e.g. the atypical combination of a preposition, a coordinator, and an adjective in *by and large*) or its meaning pole (e.g. the non-compositionality of *bite the dust*). Usage-based approaches to CxG add *sufficient frequency* as another diagnostic for identifying cxns (cf. Goldberg 2006). The notion of sufficient frequency is highly controversial, not least because it is difficult to operationalize. Since this study focusses on the onomasiological competition between contractions and full forms, relative frequency will be used as a rough approximation — and also due to its relevance to constructional change (Hilpert 2013a: 12).[39] In the following sections, modal contractions are thus measured against these three

[39] The relative frequencies reported here conflate changes pertaining to specific instances of a variable pattern (or schema) and changes pertaining to that pattern as a whole and must therefore be treated with caution (cf. Stefanowitsch & Flach 2017).

criteria: (i) formal predictability (or constraints), (ii) functional predictability and (iii) relative frequency. To demonstrate this, three modal contractions that are arguably among the clearest cases of contracted modal cxns and that have not received as much attention in the literature as *'ll* or *shan't* have been singled out. These are listed in (13).[40]

(13) a. <[*can't* V] ↔ ['inability/refusal/impossibility']>
      b. <[*won't* V] ↔ ['prediction/unwillingness']>
      c. <[[SUBJ*'d*] V] ↔ ['hypothesis/prediction/willingness']>

Each cxn in (4) consists of the contracted modal and a following bare infinitival verb, thus constituting a complex, partly schematic symbol with a specific collocational profile (Hilpert 2008, 2016a). The cxn in (13c) is a special case. As already mentioned in Section 4.2, the enclitic alone may not be considered a cxn by itself, given its host dependency. As a consequence, this cxn includes an additional open host slot typically occupied by a pronominal subject.

4.3.1 Formal properties of contracted modal cxns

The form pole of a cxn contains information about its phonological properties, its morphology and its syntactic distribution (Croft 2001: 18). Accordingly, the status of cxn may be postulated if any of these formal properties cannot be explained by a more general pattern from which they inherit their behavior. With regard to the contracted modals listed in (13), this boils down to the question whether their pivotal part, namely the contraction itself, is recognized as a distinct lexical entry.[41]

4.3.1.1 The negative contractions *can't* and *won't*

As shown in (14), both *can't* and *won't* represent cases of coalescence, which is understood here as univerbation with substance loss.

(14) a. *cannot* | /CVCVC/   >   *can't* | /CVCC/

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[40] Cxns are indicated here by using a formalism similar to the ones proposed by Booij (2010: 6) and Traugott & Trousdale (2013: 8), namely <[F] ↔ [M]>, where F represents the form pole, M the meaning (or function) pole and the symbol ↔ the correspondence link between the poles.
[41] The idea that contracted modal expressions are (becoming) autonomous is not a new one and has been investigated on the basis of emerging modals, such as *gonna*, *wanna* and *gotta*, by Krug (2000), Boas (2004), Schmidtke (2009) and, more recently, Lorenz (2013a, 2013b, 2013c).

b. *will not* | /CVC‿CVC/ > *won't* | /CVCC/

The process has eventually left the contractions as monosyllabic units that exhibit diminished morphological salience, that is, the source forms are arguably no longer as clearly recognizable. Further support for this claim comes from the observed suppletion, that is, the degree of formal unrelatedness between the stems of contracted and uncontracted forms as a result of the coalescence; compare the examples in (15).

(15) a. *cannot* | /kænɑːt/ (or /kənɑːt/) > *can't* | /kæhnt/ (or /keənt/)
  b. *will not* | /wɪl‿nɑːt/ > *won't* | /woʊnt/

The difference in the quality of the vowel between the respective contraction and its uncontracted form is decidedly more noticeable in the case of *won't*, where the vowel /oʊ/ is a closing diphthong, as opposed to the KIT-vowel /ɪ/ in *will*.[42] The pair *can't – cannot* represents a weaker case of suppletion. The TRAP/BATH-split, a feature typically associated with several British English dialects (and others), results in the unequivocal distinction between *can* /kæn/ and *can't* /kɑːnt/. A similar but more subtle *a*-configuration can also be found in some North American English dialects[43] (Labov et al. 2006: 173–181), manifesting in a lax /æ/ in *can*(*not*) and tense /æh/ (or /eə/) in *can't*, which preserves the contrast between the two forms (Labov 2010: 316–317). Also, while the vowel in both the base and the uncontracted negative form can be reduced to schwa (/kænɑːt/ > /kənɑːt/), the contraction does not have a weak form (*/kənt/).

Formally unpredictable patterns of this kind raise the question how these contractions and their uncontracted forms are interconnected in the construct-i-con. Where both the formal and semantic relatedness is robust, language users may consider a concatenative relationship, that is, a linear arrangement of morphemes; compare the examples in (16).

(16) *does*   *does not*   *does-n't*
  need V   *need not*   *need-n't*
  could   *could not*   *could-n't*
  might   *might not*   *might-n't*

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[42] Historically, the form *won't* seems to have emerged from ME *wynnot* (later *wonnot*) (OED: s.v. WILL, v.1).
[43] New York City and the Mid-Atlantic region dialects are typically associated with having a split short-*a* system.

Such a syntagmatic process, however, would be unlikely for *won't* and *can't*, given the non-existence of individual lexical items in the form of *wo* or *ca*. An analysis that views *won't* and *can't* as truly bimorphemic (*wo-n't*, *ca-n't*) would require a rule that would not only have to explain the loss of form, but also the different degrees of irregular phonology. To avoid having to posit such a rule, Booij (2010: 31–36, 2013: 264) proposes an alternative by arguing that there are paradigmatic links between conventionalized units. Accordingly, *can't* and *won't* could be stored and interconnected through subpart links with other expressions ending in *-n't*, namely the examples from the third column in (4) which, in turn, would be connected via subpart links to the examples from the second (and first) column on the basis of their respective morphologically salient stems. This network of subpart links allows speakers to form generalizations across these groups of expressions, as illustrated in Figure 4.1.
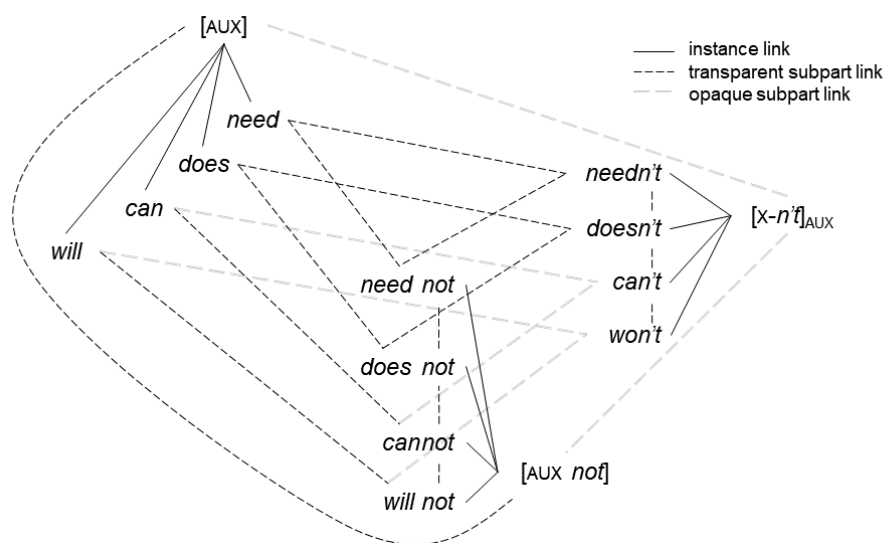
Figure 4.1. Simplified partial network of negative contractions and their related forms

The network shows that both *can't* and *won't* and their related forms *can*, *cannot* and *will*, *will not* respectively belong to the same group as *need*, *need not* and *needn't* or *does*, *does not* and *doesn't*. On a more schematic level, this relationship could be formalized as follows: [AUX] ≈ [AUX *not*] ≈ [X-*n't*]_{AUX}.[44] A distinction is made here between transparent subpart links (----) which allow speakers to parse out salient components from complex

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[44] The symbol ≈ represents a paradigmatic link. For the sake of brevity, only the form pole of a cxn will be displayed henceforth. Note that it is debatable whether speakers actually form an abstraction in the form of [AUX]. Here, it is mainly used as an analytical tool to describe the paradigmatic links.

forms, for example, *need* from *needn't*, and rather opaque subpart links (– –) that may restrict active parsing and leave forms such as *can't* and *won't* (also *don't, ain't, shan't*) to be processed as less complex units; see Hilpert & Diessel (2017: 61–62) for a similar argument on the *let alone* cxn. As such, *can't* and *won't* are not tied as strongly to their respective full forms and may thus develop idiosyncratic preferences (whether they are formally or functionally related) more readily. This will be addressed in Sections 4.3.4 and 4.3.5.

Finally, let us consider the differences between the negative contractions and the uncontracted forms regarding their syntactic distribution. To clarify this point, compare the fabricated examples in (17).

(17) a.   **Can** you **not** annoy me, please?
      a'.   **Can't** you annoy me, please?

      b.   **Will** they **not** help him?
      b'.   **Won't** they help him?

      c.   He **can** obviously **not** help you.
      c'.   He obviously **can't** help you.

It is generally the case that negative contractions remain intact in subject-auxiliary-inversion (SAI), that is, they are not split up by the subject, as can be seen in (17a') and (17b'). This has two consequences: (i) the contractions themselves cannot be replaced here by their full form (e.g. *Will not they help him?*) (Huddleston & Pullum 2002: 91); and (ii), because of this word order constraint, it is difficult to imagine a motivated process in which a sequence such as *Will they not* is chunked and eventually reduced to *Won't they*, thus providing further evidence that these contracted forms are most likely stored and retrieved holistically without recourse to the full forms. Their unit status can also be illustrated by the example in (17c'), as *can't* retains its integrity when combined with an adverb, whereas *cannot* in (17c) allows for adverb insertion. The examples in (17a) and (17a') further demonstrate the functional consequences that may arise from using negative contractions instead of full forms in inversion, as the two sentences illustrate contradicting requests; assuming that 'not being annoyed' is the desired outcome, only (17a) would potentially achieve that. Admittedly, this contrast seems to be limited to *can't* in combination with a number of verbs that typically occur in contexts of

wide scope negation (i.e. context in which the proposition rather than the modality is negated), namely transitive psych verbs (e.g. *interrupt*, *annoy*, *disappoint*), but it provides at least some evidence against the claim that modal contractions and their related full forms are identical in meaning and thus generally interchangeable.

4.3.1.2 The enclitic *'d*

In contrast to the negative contractions, the enclitic *'d* is prosodically and syntactically severely restricted. The process of coalescence eventually resulted in a syllable merger between the contraction and its host. This dependency entails that *'d* itself can neither be used emphatically, nor can it occur in verb phrase ellipsis or clause-initial position, that is, function as an operator in SAI (Quirk et al. 1985: 123); compare the examples in (18).[45]

(18) a.   **She WOULD** make it. | /ʃiː ˈwʊd/
      a'.   *****She'D** make it. | *****/ʃiːˈd/

      b.   No, but **he would**.
      b'.   *****No, but **he'd**.

      c.   **Would** they even help us?
      c'.   *****'D** they even help us?

These prosodic and syntactic limitations confirm that the enclitic *'d* is most likely processed as the pivotal element of a larger schema, namely [[SUBJ*'d*] V], whereas *would* may very well receive its own lexical entry. Next to *would*, the only other modal that has a cliticized form is *will*. As already pointed out in Section 4.2 and in analogy to the analyses presented for *'d*, the enclitic *'ll* also needs to be considered the fixed element of a variable pattern in the form of [[SUBJ*'ll*] V]. An attempt to model a partial network these cxns would belong to is presented in Figure 4.2.

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[45] It is possible for a sequence such as *would you do it* to be reduced to *d'you do it* | /d(ʒ)juːˈduːɪt/; but this reduction is not institutionalized, and its use would be limited to rapid speech.
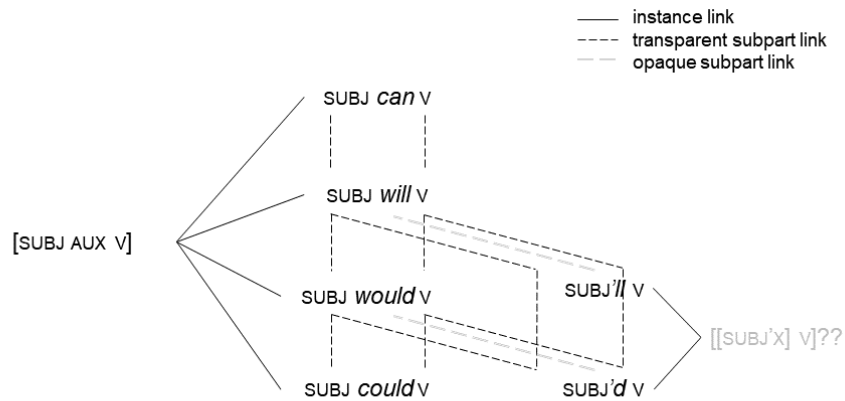
Figure 4.2. Simplified partial network of enclitic cxns and their related forms

The enclitics are in all likelihood connected to their full form on semantic (or functional) grounds, but they are not assumed to be actively derived from them during retrieval due to the lack of a corresponding productive deletion pattern. It is also questionable that speakers will be able to abstract a higher-level cxn in the form of [[SUBJ 'X] V] from two types only.

To sum up, the contractions investigated in this study are institutionalized and not just online variations in spontaneous, rapidly produced spoken language. For the negative contractions, there seem to be no productive morphological patterns that can explain the coalescence in (14) along with either the *a*-tensing in (15a) or the diphthongization in (15b), which is why it is fair to assume that each form is generally stored and processed holistically by contemporary speakers. The deletion of /w/ and /ʊ/ in the case of *'d* renders the contraction inseparable from its host and therefore diminishes its syntactic freedom. Unlike *can't* and *won't*, *'d* would not likely receive its own lexical entry, given that both its host and a following infinitival verb are required.

Despite these idiosyncrasies, it would be misleading to assume that speakers do not recognize any similarities between contracted and uncontracted forms, that is, the formal attributes discussed above are not likely to impede recognition of relatedness but may point to separate nodes in the construct-i-con (cf. Booij 2010: 250–254). If this is indeed the case, then the question arises whether the formal differences between contracted and uncontracted forms are accompanied by differences in their respective functions. This will be tested empirically in the following sections.

4.3.2 Corpus selection and outline for data exploration

Up to now, COHA remains the only sizable historical corpus of AmE with a total of roughly 400 million words spread over a time span that ranges from 1810 to 2009.[46] For several reasons, this paper draws mainly on data from COHA's fiction section (FIC). First, and most importantly, contractions are a spoken phenomenon to begin with, which means that we are more likely to find sufficient empirical evidence of their use in writing in less conservative, spoken-like registers. Secondly, it is expected that any form of stigmatization regarding the use of contractions in writing will have a lesser, if any, effect on fictional texts, thus yielding a more accurate picture of the actual use of modal contractions. Thirdly, much distortion in the data can be avoided ex ante by not lumping together the different genres for which COHA provides texts. And fourthly, since fictional texts are available for all data points in COHA (unlike newspaper prose), the development of contractions can be traced back further historically. Eventually, the other sections in COHA, namely newspaper prose (NEWS), popular magazines (MAG) and non-fictional books (NF), will receive some attention in light of the discussion on constructional change in Section 4.4. Furthermore, to do some justice to at least two issues that are often raised in contemporary corpus linguistics, namely rigor and replicability, the present paper approaches modal contractions in a more data-driven way than the studies mentioned in Section 4.2 above and makes use of some of the currently available corpus-linguistic methods to diachronic data. While the methodological details will be provided in the following sections alongside the respective results, a brief outline of how the data were explored is in order.

The first step involved the exhaustive data retrieval of all instantiations of the three modal cxns [*can't* V], [*won't* V] and [[SUBJ*'d*] V] and their corresponding uncontracted forms from the BYU's online interface using the following queries: `ca.[vm] n't [v?i], can.[vm] not [v?i], wo.[vm] n't [v?i], will.[vm] not [v?i], [p*] 'd.[vm] [v?i] and [p*] would.[vm] [v?i]`.[47] As mentioned above, it is specifically their relative frequency that is important here. It was also used as input for the variability-based neighbor clustering analysis (VNC) (Gries & Hilpert 2008) that was carried out in step two. VNC does not only help detecting quantitative structure in diachronic corpus

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[46] Note that the 1810s and 1820s are excluded from the present investigation.
[47] The queries obviously exclude uses of contractions and their full forms in different syntactic configurations, such as inversion, adverb insertion and ellipsis. However, focusing only on the most basic (and arguably most prototypical) pattern ensures that they are at least theoretically fully interchangeable (see discussion in Section 4.3.1).

data (Hilpert & Gries 2009), but it was explicitly utilized here to identify the periods for which a series of distinctive collexeme analyses (DCA) (Gries & Stefanowitsch 2004) were conducted in the third step. As an exploratory method, DCA can be seen as an approximation towards identifying potential meaning differences between contracted and uncontracted forms, as it identifies the collexemes that best distinguish between these alternations. Based on these collexemes, random samples were drawn and manually annotated for different variables (e.g. TYPE OF MODALITY, TIME) that might affect a speaker's choice between contractions and full forms. Finally, the influence of these variables was assessed by fitting generalized linear mixed-effects models (GLMM's) (Baayen 2008; Faraway 2016) to the samples.

4.3.3   Relative frequency distribution across time

The previous section has already alluded to the importance of relative frequency for constructional change. The term *relative frequency* refers to the probability {0,1} of encountering a linguistic unit in comparison to another in contexts where both are at least theoretically interchangeable given their functional overlap. From a constructionist perspective, shifts in relative frequency distributions possibly reflect a reorganization of the mental representations speakers have abstracted from the memorized instances of these forms and bring about a constructional change (Hilpert 2013a: 17). The respective developments in the relative frequencies of the three contracted modal cxns investigated here are presented in Figure 4.3.
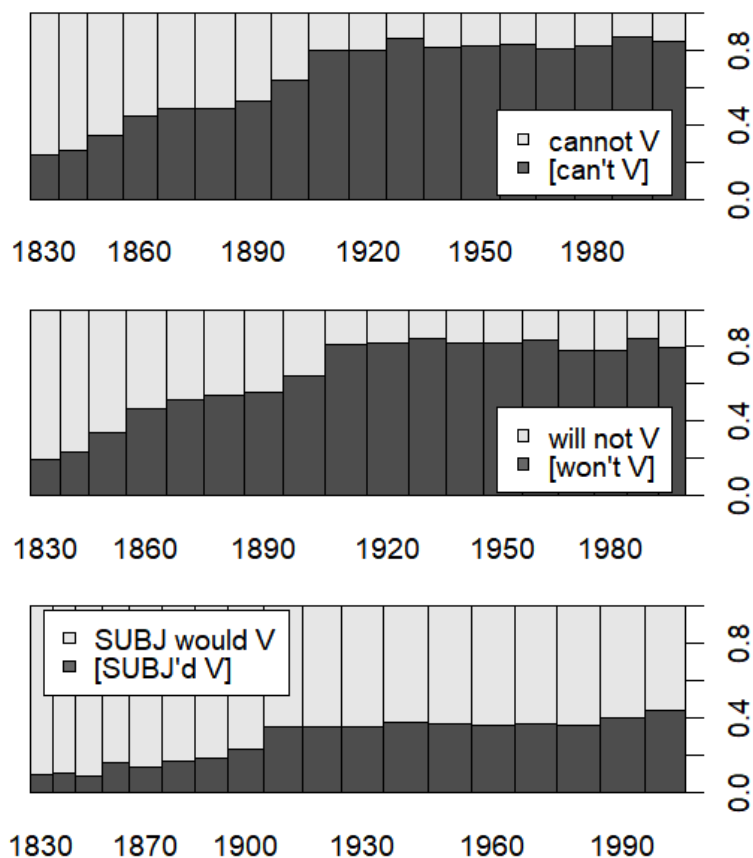
Figure 4.3. Changes in the frequencies of [*can't* V], [*won't* V] and [[SUBJ*'d*] V] relative to their full forms; COHA_FIC

From the spine plots, it is obvious that the negative contractions surpassed their full forms in usage frequency by the end of the 19th century and maintain a relative frequency of about .8 (i.e. a probability of occurrence of ca. 80%) throughout most of the 20th century. [[SUBJ*'d*] V] lags behind in this regard, falling just short of being at par with its full form by the 2000s. Additionally, the bar widths provide information on the combined normalized token frequency for each pair in each decade. An increase in the relative frequency of a contraction (dark grey area within a bar) coupled with an increase in bar width is thus indicative of a rearrangement of its percentage shares brought about by an actual increase in token frequency of that contraction; compare, for example, [[SUBJ*'d*] V] in the 1830s and 1910s. The apparent upwards trends for all three contractions are confirmed by the correlation statistics in Table 4.1.

Table 4.1. Trends in the relative development of [*can't* V], [*won't* V] and [[SUBJ*'d*] V] between 1830 and 2009; COHA_FIC

	[*can't* V]	[*won't* V]	[[SUBJ*'d*] V]
r_τ	.84	.69	.83
$p_{\text{two-tailed}}$	<.0001	<.0001	<.0001

In order to detect frequency trends in diachronic corpus data, Hilpert & Gries (2009) recommend using Kendall's Tau (r_τ), a non-parametric rank-order correlation measure. For all three cases, the r_τ-value is larger than .50, suggesting a strong, positive correlation between the variables TIME and RELATIVE FREQUENCY. What may not become obvious from simply looking at the slopes is that we actually find the weakest correlation in the case of [*won't* V], despite the relative development of the cxn being nearly congruent with that of [*can't* V] for which the correlation is the strongest. Conversely, the correlation coefficient for [[SUBJ*'d*] V] is almost as large as it is for [*can't* V]. In any case, the observed trends are highly significant at *p*<.0001, which provides evidence for constructional changes.

Going beyond the overall trend, the relative frequency distributions can be used as input for the VNCs in order to objectively identify the different stages of the constructional changes at hand, while reducing information complexity at the same time.[48] Thus, rather than having the time periods predetermined by the corpus (namely annual or decadal data points in COHA) or through any subjective observation on the part of the researcher (e.g. a division of the corpus into LModE and PDE components), VNC allows the researcher to partition diachronic data in a bottom-up, data-driven fashion. Figure 4.4 shows the respective VNC dendrogram and the corresponding scree plot for each contracted modal cxn.

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[48] VNCs were carried out by using the function `vnc.individual()` from Gries & Hilpert's (2012) R workspace {vnc.individual.RData}.
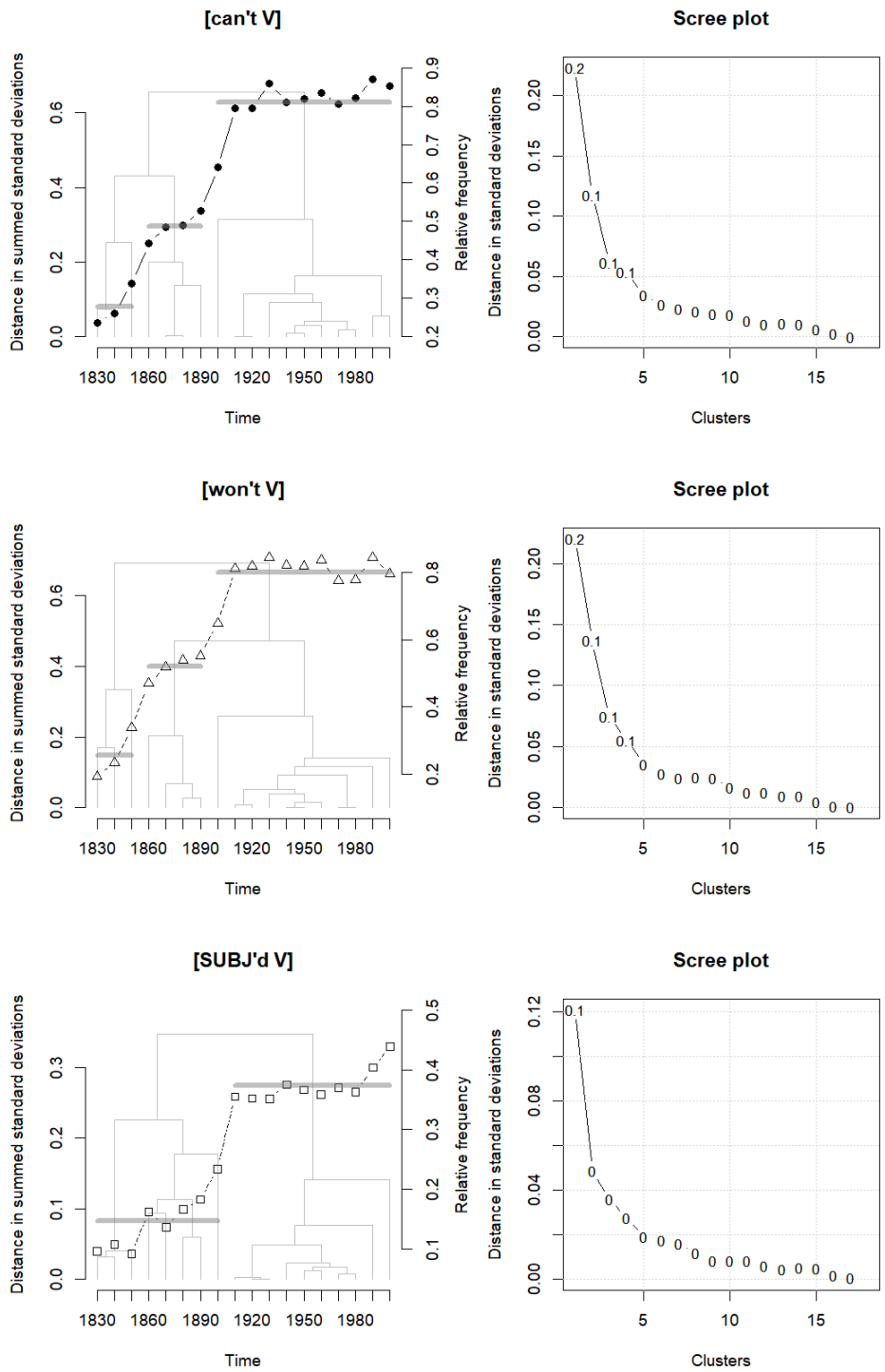
Figure 4.4. VNC dendrograms and corresponding scree plots over relative frequencies of [*can't* V], [*won't* V] and [[SUBJ*'d*] V]; grey horizontal lines indicate the developmental stages

The left-hand side depicts the different amalgamations detected by the VNCs for each case along with the respective line plots for the relative frequency distribution superimposed on the dendrograms. Here, the hierarchical clustering algorithm uses the standard deviation as similarity measure to determine in which adjacent periods the

relative frequencies are similar enough for these periods to be merged into larger clusters. The accompanying scree plots next to each dendrogram help determining the 'right' number of clusters (or different stages) to be assumed within a diachronic development, that is, which clustering solution represents the best trade-off between information density and interpretability or generalizability of the results (Hilpert 2013a: 33–34). The first point of inflexion (i.e. where the scree plot shows a noticeable bend) can be used as an indicator. In the cases of [*can't* V] and [*won't* V], a three-cluster solution seems preferable; for [[SUBJ*'d*] V], two clusters may be assumed. The respective solutions are visualized by means of grey horizontal lines which represent the mean relative frequencies of the different diachronic stages in each VNC dendrogram in Figure 4.4. What becomes immediately clear is that the periodization determined by the VNC does not result in clusters that are equidistant; for example, there are three stages in the development of [*can't* V] — the first stage consists of a cluster of 30 years (1830–1859), the second of 40 years (1860–1899), and the final cluster of 110 years (1900–2009). The same clustering is proposed for [*won't* V], while the development of [[SUBJ*'d*] V] consist of two stages only, an 80-year cluster (1830–1909), and a 100-year cluster (1910–2009). In all three cases, much of the overall increase happened in the 19th century. From the beginning of the 20th century onwards, the relative frequencies stabilize as indicated by the long (100-plus years) final stages in the diachronic developments. The fact that the contractions have not fully ousted the full forms and that the relative frequencies stay rather constant throughout the respective final periods may point to a functional split between contracted and uncontracted forms, that is, each form occupies its own niche (cf. Hilpert 2013b: 464). Whether this is actually the case will be part of the investigation presented in the following sections.

4.3.4 Changes in the collostructional behavior of the alternations

This section starts from the premise that changes in the (relative) frequency of a cxn can either facilitate or may be facilitated by changes in its collostructional behavior (quantitatively and possibly qualitatively) and, by extension, its meaning. To investigate this for the individual cases, a series of synchronic DCAs were performed based on the respective periodization determined by the VNCs.

In a nutshell, DCA measures the attraction (or repulsion) between a lexical item (collexeme) and a specific cxn over another functionally similar one; for example, it can

be used to detect, which infinitival verbs are more strongly associated with [*won't* V] relative to *will not* V. Although originally developed for synchronic data, Hilpert (2006) proposes the most popular diachronic adaptation of DCA in which he applies this method to a single cxn across different historical stages. The diachronic adaptation of DCA employed in this study differs from Hilpert's approach in that it focusses on the direct comparison of competing cxns through time. In other words, the distinctive collexemes of coexisting contracted and uncontracted forms for each VNC period will be compared using the original, synchronic variant of DCA.[49] The interpretation of the results therefore remains rather straightforward, with one caveat. Although the algorithm will identify which slot fillers best distinguish between the contracted modal cxns and their corresponding full forms in the respective VNC periods, the periods themselves are essentially treated as internally static. It is clear that this does not mirror actual language use accurately because the probabilistic evaluation speakers are assumed to perform over their input is a continuous, reiterating process (Stefanowitsch 2006: 261). As a consequence, there is no reason to assume that collostructional preferences remain completely fixed for any period regardless of its size. While this would carry less weight with smaller clusters, some extend over the average life expectancy of a speaker, which means that it is difficult to maintain any claims to psychological plausibility here. This problem could potentially be reduced by keeping the periods as small as possible (in COHA, annual data points), but then the input needed for the DCA may in fact become too sparse to yield significant results and the overall picture would perhaps become too fragmented to be readily interpretable. Conducting VNC-based DCAs therefore represents a data-driven compromise.

The first step to carrying out the DCAs involved extracting all types of each contraction and their full form along with their respective token frequencies from COHA. Secondly, the data were cleaned up manually to account for spelling variations and scanning errors. Finally, the data were submitted to the corresponding functions from Flach's (2017a) R package {collostructions}. For the negative contractions and their full forms, the negative log10-tranformed *p*-values of a Fisher-Yates exact test (FYE) were used as an association measure to calculate the collostructional strength (or *distinctiveness*). In the case of [[SUBJ*'d*] V] and its uncontracted counterpart, the *G²*

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[49] Johannsen & Flach (2015) use a similar adaptation to investigate the obligatoriness of progressive over simple verb forms in BrE from a long-term diachronic perspective. Their analysis, however, is not based on a VNC-determined periodization but fixed 70-year intervals.

statistic of the log-likelihood ratio test (G^2) was employed instead, given that FYE returned infinite values for some collexemes. The output from the DCAs was then investigated for potential clusters the respective collexemes might be sorted into. The results are listed in Tables 4.2–4.4.

Table 4.2.   Changes in the 25 most distinctive collexemes in *cannot* ᴠ and [*can't* ᴠ]

	cannot ᴠ				[*can't* ᴠ]			
	collex	**FYE**	**collex**	**FYE**	**collex**	**FYE**	**collex**	**FYE**
1830–1859	be	27.64	brook*	2.63	get	49.48	begin	3.53
	fail	14.01	enter*	2.63	stand	23.38	teach	3.53
	doubt	6.84	refrain*	2.49	help	22.49	stop	3.49
	know	4.61	hope	2.47	do	15.62	seem	3.41
	escape	4.38	suffer	2.36	make	10.78	have	3.41
	avoid*	4.25	forbear*	2.34	see	6.81	read	3.39
	comprehend	3.95	exist*	2.19	find	5.80	run	3.38
	die	3.93	fly*	2.19	wait	5.38	attend*	3.26
	consent*	3.51	remain	1.97	afford	4.46	hurt	3.05
	love	3.34	weep*	1.90	sell	4.23	depend	3.03
	describe	3.06	forget	1.76	say	4.07	shoot	3.03
	choose	2.84	conceal*	1.76	tell	3.95	pay	2.93
	speak	2.69			go	3.72		

	cannot ᴠ				[*can't* ᴠ]			
	collex	**FYE**	**collex**	**FYE**	**collex**	**FYE**	**collex**	**FYE**
1860–1899	be	41.03	fathom*	4.66	get	41.73	afford	4.70
	fail	25.43	enter	4.65	do	37.43	seem	4.55
	comprehend	11.76	know	4.35	help	21.16	eat	4.53
	doubt	11.59	avoid	4.30	stand	19.32	let	4.13
	forget	7.28	love	4.15	make	12.05	catch	3.70
	accept	5.92	exist	3.98	stop	11.17	talk	3.59
	answer	5.72	leave	3.89	go	9.65	put	3.52
	die	5.57	hide	3.80	fool	8.72	play	3.40
	endure	5.46	share	3.79	have	5.70	hurt	3.23
	hope	5.40	remain	3.66	begin	5.46	find	3.03
	give	5.34	describe	3.43	run	5.44	imagine	3.00
	conceive	5.03	follow	3.29	keep	5.18	want	2.88
	speak	4.97			think	5.00		

	cannot ᴠ				[*can't* ᴠ]			
	collex	**FYE**	**collex**	**FYE**	**collex**	**FYE**	**collex**	**FYE**
1900–2009	be	121.81	enter	10.72	get	96.08	take	8.44
	permit	24.31	understand	9.67	do	60.85	stop	7.47
	fail	23.82	recall	9.51	stand	35.27	keep	6.73
	escape	18.06	die	8.99	wait	19.41	fool	6.62
	endure	16.37	alter	8.79	help	16.03	beat	6.13
	speak	15.18	choose	8.43	talk	15.61	have	6.01
	conceive	13.33	bear	8.42	go	14.67	stay	5.85
	know	12.31	allow	7.88	figure	13.17	blame	5.55
	remain	12.00	doubt	7.49	believe	10.73	remember	5.36
	exist	12.00	describe	7.47	let	10.60	miss	5.16
	comprehend	11.83	hope	7.22	seem	8.90	afford	4.95
	accept	11.43	live	7.13	make	8.80	start	4.70
	harm	10.72			handle	8.69		

verb	emotional/mental state or activity	verb	permission/approval/refusal
verb	dynamic action	*	verb not shared

Table 4.2 shows changes in the 25 most distinctive collexemes for the cxn [*can't* ᴠ] and its full form from the first to the final VNC cluster. As could have been expected, the increase in the relative frequency distribution of the contraction reflects an increasing

acceptance that allows for more verbs to enter the cxn. While eight of the 25 distinctive collexemes for *cannot* in the first VNC period do not occur in [*can't* V] yet, all verbs listed in the final period are shared by both expressions. Regarding the semantic similarities of the respective distinctive collexemes, a first observation that can be made is that [*can't* V] has become increasingly distinctive with regard to cognitive verbs encoding an emotional/mental state or activity (e.g. *remember*, *believe*, *miss*). Thereby, the contraction seems to become more like its full form which has already been used with verbs from the same domain. At the same time, there is a strong tendency for high dynamicity action verbs to co-occur with the contraction rather than the full form. Unfortunately, neither verb type allows for a confident prediction as to what kind of functional preferences the contraction may have or has developed. For example, the function 'ability' is not generally tied to action verbs of any specific degree of dynamicity, but only to inherent properties on part of an animate subject with agentive function (Coates, 1983: 89–93) — something that the DCAs do not show. Lastly, *cannot* has started to attract verbs such as *permit* and *allow*. In contrast to cognitive or action verbs, these can be expected in permissive contexts rather than situations that relate to any intrinsic abilities (or rather lack thereof) on part of the subject referent.

Table 4.3. Changes in the 25 most distinctive collexemes in *will not* v and [*won't* v]

1830–1859

	will not v			[*won't* v]			
	collex	FYE	collex	FYE	collex	FYE	collex	FYE

collex	FYE	collex	FYE	collex	FYE	collex	FYE
fail*	10.49	shrink*	2.01	do	51.10	like	2.66
attempt*	6.84	venture*	2.01	have	14.28	take	2.57
suffer	5.57	remain*	1.87	get	13.85	spoil	2.22
be	3.87	repeat*	1.87	hurt	10.96	come	2.18
permit	3.40	doubt*	1.74	let	8.74	hold	1.99
refuse	3.23	hesitate*	1.74	want	5.56	run	1.99
deny	3.20	dwell*	1.61	go	5.35	touch	1.77
harm	2.82	enter*	1.61	stand	4.80	miss	1.71
betray	2.73	fear*	1.61	pay	4.24	make	1.64
seek*	2.54	prove*	1.61	tell	3.59	eat	1.61
wonder*	2.54	leave	1.60	work	3.25	drink	1.46
follow	2.11	offend	1.53	mind	3.07	believe	1.39
yield	2.07			help	2.89		

1860–1899

collex	FYE	collex	FYE	collex	FYE	collex	FYE
fail	14.08	dwell*	3.85	do	57.25	take	4.00
refuse	10.15	betray	3.69	have	17.84	work	3.08
permit	8.94	forsake	3.57	hurt	16.44	keep	2.80
leave	8.31	speak	3.41	get	14.40	help	2.54
return	7.80	shrink	3.28	stand	12.01	count*	2.54
allow	5.26	detain	3.09	tell	8.35	know	2.28
suffer	5.24	tolerate	2.99	mind	7.75	blow*	2.26
attempt	4.54	wonder	2.92	go	6.43	bother	2.22
accept	4.31	fear	2.70	catch	5.42	make	2.20
desert*	4.17	serve	2.66	charge	4.62	shoot	2.19
be	4.08	rest	2.63	want	4.46	wash*	1.98
remain	4.02	injure*	2.57	let	4.30	play	1.84
yield	3.96			like	4.04		

1900–2009

collex	FYE	collex	FYE	collex	FYE	collex	FYE
permit	22.90	fight	7.80	get	46.04	take	5.06
return	21.02	accept	7.66	have	24.18	find	4.59
allow	18.55	betray	7.49	mind	23.05	say	4.40
cease*	18.06	obey	6.98	do	21.19	last	4.33
fail	16.57	die	6.72	hurt	20.51	talk	4.13
suffer	13.15	desert	6.66	tell	17.26	matter	3.24
tolerate	12.70	spare	6.65	let	17.04	feel	3.02
harm	10.89	abide*	6.25	work	9.42	stand	2.93
speak	10.09	receive	5.94	bother	9.21	make	2.44
attempt	9.52	endure	5.82	need	6.21	start	2.41
refuse	8.76	wish	5.82	like	5.95	shoot	2.18
remain	8.26	deny	5.69	bite	5.77	want	2.04
pass	7.82			know	5.36		

	verb	emotional/mental state or activity		verb	permission/approval/refusal
	*	verb not shared			

A somewhat similar picture is presented by [*won't* v], see Table 4.3. Again, relative to the full form, it is the cognitive or emotion verbs that the contraction increasingly attracts beyond chance level; see Biber et al. (1999: 174–175) for a similar observation on negative contractions in general. By contrast, these verbs, apart from *wish*, are absent

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from the list of the top 25 distinctive collexemes of the full form in the last VNC period. Instead, *will not* has developed a strong, distinctive preference for verbs that would conform well with its 'unwillingness' reading (e.g. *accept*, *obey*, *permit*). Given that these verbs are typically used in contexts where the subject referent tries to convey seriousness and determination to the interlocutor, it is plausible that the preferred choice is the potentially more emphatic, longer, more formal, uncontracted form, as illustrated by the examples in (19)–(21).

(19) I do not have to seek another; I do not intend to do so for a long time – perhaps never. I **will not accept** any suggestions in that direction. Do I make myself clear? [COHA, FinalPlanet, 1987]

(20) We will not do as the Romans do. We **will not obey** the Roman law. [COHA, Spartacus, 1958]

(21) I **will not permit** you to occupy Orison, making us little more than a hostage population. I do not call that an alliance. [COHA, CaptiveBride, 1987]

Overall, the data in this case illustrate an arguably more noticeable collexemic demarcation than could be observed for [*can't* V]. Taking both the development in the relative frequency distribution and the collostructional changes into consideration, [*won't* V] and its uncontracted form may thus qualify as a clearer case of division of labor. Also, the observation lends weight to Goldberg's (1995: 67) *Principle of No-Synonymy*, as the distinctiveness in form (see the discussion in Section 4.3.1.1) correlates here positively with a (potential) distinctiveness in function.

Finally, consider the cxn [[SUBJ*'d*] V] in Table 4.4. The data from the first VNC period already suggest a potential functional split between the contraction and its full form, as the most distinctive collexemes show little semantic overlap. Falling in line with the previous observations on contractions, the enclitic also exhibits a relative preference for mental/emotive verbs (e.g. *know*, *love*). Moving to the second period, this observation is corroborated, given the noticeable increase in the number verbs from that domain among the contraction's top distinctive collexemes. The full form, on the other hand, remains quite stable regarding its distinctive collexemes; 18 of the 25 collexemes listed in the first period are also among the top ones in the second period. Most strikingly, the very top of the list is dominated by the same relational state verbs (e.g. *be*, *seem*, *appear*) in both periods.

Table 4.4. Changes in the 25 most distinctive collexemes in SUBJ *would* V and [[SUBJ*'d*] V]

		SUBJ *would* V				[[SUBJ*'d*] V]			
	collex	**G^2**	**collex**	**G^2**	**collex**	**G^2**	**collex**	**G^2**
1830–1909	have	857.99	speak	17.17	like	3004.09	love	37.08
	be	833.28	seek	17.01	get	158.21	cut	35.87
	seem	270.5	enter*	16.78	let	158.07	lick	34.09
	appear	59.32	sound*	16.78	give	151.53	feel	33.29
	return	51.67	suppose	15.79	hate	125.27	fetch	31.53
	remain	35.52	cost	14.31	want	109.08	sell	30.62
	require	34.03	please	13.84	come	88.55	swear	30.23
	become	28.92	consent	13.50	bet	71.12	stay	29.36
	afford*	25.01	burst	13.38	put	66.93	set	28.17
	receive	24.10	escape	13.12	run	59.65	hit	26.46
	prove	21.67	pass	13.12	go	42.96	think	25.43
	suit	18.74	attempt*	13.01	know	41.35	tell	25.29
	suffer	17.76			try	38.40		

		SUBJ *would* V				[[SUBJ*'d*] V]			
	collex	**G^2**	**collex**	**G^2**	**collex**	**G^2**	**collex**	**G^2**
1910–2009	have	2722.10	wish	96.27	like	5265.82	've	152.93
	be	1262.98	receive	95.32	get	1109.39	run	149.88
	seem	1117.12	prove	81.26	love	807.57	call	131.27
	appear	205.30	allow	79.43	want	578.08	read	126.44
	speak	165.48	consent	77.70	come	560.76	quit	124.91
	require	164.76	yield	75.69	hate	522.94	need	118.45
	return	156.36	bear	72.66	say	506.29	tell	117.07
	remain	119.64	serve	72.29	think	351.86	guess	110.27
	suppose	114.74	make	67.01	put	340.01	start	99.01
	save	113.63	cost	64.19	let	224.49	feel	87.49
	seek	107.49	suit	60.92	hit	189.92	expect	83.76
	afford*	99.55	suffer	58.60	appreciate	187.35	pick	82.95
	please	97.69			know	172.84		

verb	emotional/mental state or activity	verb	relational state
*	verb not shared		

A shortcoming of DCA is that it only highlights differences between alternations and provides no information on their similarities, which means that no definitive information on the cxns' actual collexemic profiles (i.e. which collexemes are most strongly attracted/repelled considering their overall occurrence in the sub-corpus) can be obtained on the basis of distinctive collexemes only. This could be overcome by performing simple collexeme analyses (SCA) (Stefanowitsch & Gries 2003) for each alternation in each VNC period followed by a pairwise comparison.[50] The reason SCAs were not carried-out here is twofold: (i) it was simply deemed too labor-intensive to retrieve the overall occurrences of the collexemes in question from the BYU's online interface, given that it is not possible to obtain this information without having to conduct an unfeasible number

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[50] As was suggested by an anonymous reviewer.

of queries. And (ii), even if SCAs would reveal more than a few similarities between the contractions and their full forms regarding their most strongly attracted collexemes, something that would not be too surprising given the high degree of relatedness of these alternations, the purpose of this paper is to uncover the subtle differences for which DCA is sufficiently suitable.

Obviously, the results from the DCAs do not automatically translate into the type of modality expressed by each form, but the differences reported here suggest that it is worth pursuing the idea that each expression may have distinctive functional preferences. But before turning to a closer semantic analysis, there is another collexemic property the DCA has revealed that is worth mentioning. Beyond the semantic clusters discussed above, the verbs that occur in the contracted modal cxns are also structurally different from the ones occurring with the full forms. More specifically, the collexemes that are most distinctive for the contractions (at $p<.05$) in the final VNC periods are on average .6 syllables shorter than the full forms ($M_{contr}=1.25$, $SD_{contr}=.54$, $M_{full}=1.85$, $SD_{full}=.68$, Welch's $t(790)=$-16.767, $p<.0001$).[51] In a recent study, Levshina identified a correlation between slot filler informativeness and formal length of near-synonymous cxns (e.g. *want to* V vs *wanna* V), proposing that the less informative (or less surprising, i.e. more probable) a slot filler is for a given cxn, the more likely that filler is to occur with the less coded variant (Levshina 2019: 171–172). While the present study does not intend to equate informativeness of a slot filler with its length, it will still be assumed that construction length and slot filler length are somewhat connected and relevant on either prosodic and/or functional grounds, which is why slot filler length will be treated as a predictor for the analysis in 4.3.5.

4.3.5 Modelling speakers' choice between a contracted modal cxn and its full form

Following through with the data-driven approach implemented here thus far, the results from the DCAs inform the next methodological step. As already mentioned, DCA does not identify the different types of modality associated with each modal cxn. For example, [*can't* V] may be used to express either epistemic or non-epistemic meaning; which one it is can often not be inferred from simply looking at a bigram such as *can't get*, but requires more co(n)textual information, as illustrated in (22)–(24).

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[51] The numbers for the syllables were obtained using the function `nsyllables()` from Benoit et al.'s (2018) R package {quanteda}.

(22) I overslept this morning and now I **can't get** going. [COHA, WhileMyPrettyOne, 1989]

'inability'/dynamic

(23) Didn't your consul general tell you what we both know? I **can't get** into the United States on a Nansen passport. [COHA, DangersPath, 1999]

'permission not granted'/ deontic

(24) "Well, it **can't get** any colder now, that's sure," Harold said. [COHA, TownWith FunnyName, 1948]

'impossibility asserted'/epistemic

While some collexemes can reasonably be expected to occur more often in one functional context than in another, for example, *allow* in permissive/deontic or volitional/dynamic contexts and *seem* in epistemic contexts, the pervasiveness of polysemy with regard to modal expressions merits a semantic analysis beyond the differences identified by the DCAs. Nonetheless, it was deemed important to retain the information about the lexical biases for each alternation, given that this information can be considered part of speakers' knowledge of these cxns. To this end, a sub-corpus was created consisting only of the contractions and the full forms with their respective most distinctive collexemes. From this corpus, twelve random samples with 400 example sentences each (= a total of 4,800 examples) were analyzed and annotated for TYPE OF MODALITY expressed in order to ascertain whether there are any context-dependent meaning differences and changes in the use of contracted modal cxns and their full forms when combined with the verbs for which they are maximally distinctive.[52] The different levels for the independent (or predictor) variable TYPE OF MODALITY are largely based on the tripartite distinction proposed by Huddleston & Pullum (2002: 178–179), namely, deontic, dynamic and epistemic meaning. However, since such a rather coarse-grained approach will sometimes fail to adequately describe all the subtleties inherent in these functional categories, specifically the different meanings subsumed under non-epistemic modality (see e.g. Van der Auwera & Plungian 1998; Depraetere & Reed 2011), adjustments towards more detailed categories were made when necessary. For example, in the case of [*can't* V],

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[52] An anonymous reviewer raised concerns regarding the validity of the results such a data selection produces compared to a random sample drawn from all instances. This concern is valid insofar that the results will be robust only for the distinctive collexemes. Yet, as discussed earlier, the aim here is to highlight the differences between contractions and full forms.

dynamic modality was split further into 'ability' and 'non-deontic root possibility'. Previous corpus studies have identified these as the two most frequent meanings associated with the modal *can* in contemporary English (Coates 1983: 93, 101; Collins 2009: 98, 101). This sub-categorization may thus provide a more accurate picture of the functional differences. Other independent variables considered are TIME, SYLLABLE LENGTH OF COLLEXEME and SOURCE; for [[SUBJ'*d*] V] and SUBJ *would* V, additional variables concerning the properties of the subject, namely PERSON and ANIMACY, were taken into account, given the enclitic's host dependency. An excerpt from the data is shown in Figure 4.5; the different variables and their levels are summarized in Table 4.5.

year	source	context_1	cxn	collex	context_2	VNC_period	sense	mod_type	syll_collex	SUBJ_pers	SUBJ_animacy
1853	Ella Barnwell	I'm an old man, Simon Girty, " said Younker, in reply, " and	can't	run	as I once could -- so you needn't reckon on my gitting through alive.	1830–1859	in-ability	dyn abil	1	–	–
1852	Hatchie Guardian	You know him, do you? '' continued he. '' Well, no -- I	can't	say	I do. '' '' But you have business with him? ''	1830–1859	formulaic		1	–	–
1975	FiveGates Armageddon	No. I suppose it's just me being mummish. A few more hours	won't	make	any difference -- except to me, of course. But I expect	1900–2009	assertion	epist	1	–	–
1880	Bricks Without Straw	. '' '' But what about Red Wing? '' asked Hesden. ''	I'd	like	ter see it once mo', '' said the broken-hearted man, while	1830–1909	wish/desire	dyn	1	1st	animate
2000	Courtship	I will lend you a treatise on it. Now, you	cannot	allow	Douglas - always to discipline you first.	1900–2009	permission not granted	deont	2	–	–
1953	Mov:Affair With Stranger	Excitedly she knocks on the window and calls. Her voice	cannot	be	heard, but her mouth is plainly calling, '' Bill. ''	1900–2009	circumst. im-possibility	dyn poss	1	–	–
1921	Wild Justice Stories	' she burst out. '' I'm his, Greg. I	will not	betray	my husband for any man. '' Again he besought her to go with him	1900–2009	un-willingness	dyn	2	–	–
1959	Eva	one announced, " We are now going on a journey. You	will not	speak	to anyone on the way, nor are you permitted to speak with us.	1900–2009	permission not granted	deont	1	–	–
2009	KillingWay	Arthur loved the old man like a father, and he	would	hesitate	to have him executed, hesitate until the people began to ponder whether he had	1910–2009	past prediction	epist	3	3rd	animate

Figure 4.5. Excerpt from the random samples with added annotation

Table 4.5. Summary of variable coding for random samples

VARIABLE	LEVELS
dependent	
CONSTRUCTION	contraction | full form
independent (random effect)	
SOURCE	<diverse authors/texts>
independent (fixed effects)	
TYPE OF MODALITY	epist | deont | dyn | dyn_abil | dyn_poss
SYLLABLE LENGTH OF COLLEXEME	one | two | three | four
SUBJECT PERSON	1st | 2nd | 3rd
SUBJECT ANIMACY	animate | inanimate
TIME	first VNC period | final VNC period

Functionally ambiguous cases and formulaic expressions were ignored because including them would not contribute to understanding the variation between full forms and contractions. Also note that TIME only has two levels here. Since the results from the DCAs indicate a rather gradual change in the most distinctive collexemes, the 'middle' clusters for the negative contractions were excluded from further analyses. Focusing only on the first and final periods simply brings the changes that occurred more into prominence.[53]

To assess the weight or influence the different predictors have on the dependent (or response) variable CONSTRUCTION, GLMMs were fitted to the data.[54] Initially, it was determined whether assuming a random-effect structure was justified, that is, whether GLMMs with SOURCE as a random effect provide a significantly better fit for the data than fixed-effects binomial logistic regressions (GLMs). This was done by pairwise AIC (Akaike Information Criterion) comparisons of the baseline (or intercept only) GLMs and GLMMs for each case. Since the AIC-values for each GLMM were lower than for the GLMs in all three cases, the random effect was included. Following this, the final models were determined by employing a stepwise step-up procedure, that is, the predictors were added successively and retained if the fit for the updated models improved (cf. e.g. Schweinberger 2019). This was also done for all two-way interactions of which none made it into the final models, either because their effect was not significant or including them led to multicollinearity between the predictors. The latter was tested using VIF

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[53] It should be noted that TIME is included here to explain the data rather than speakers' actual choice between alternations (cf. Stefanowitsch 2006).

[54] All regression models were fitted using Harrell's (2019) R package {rms}, Bates et al's (2019) R package {lme4} and several snippets from Schweinberger's (2014) script {meblr.summary.r} and (2018) script {AmpAus_Part4_20190520.R} which were kindly provided by the author.

(Variance Inflation Factor) values as an indicator; if VIF ≤ 3, collinearity was not considered an issue and the predictors in question were retained. Finally, all cases where a factor level led to complete separation of the data, that is, when a certain level of an independent variable does not occur with both levels of the dependent variable, had to be removed. The summaries for the three final minimal adequate models are listed in Tables 4.6–4.8.

Table 4.6. Results from the GLMM for [*can't* V]

Call:						
glmer	(cxn ~ mod_type + syll_coll + VNC_period + (1 | source), family = binomial, data = cant, glmerControl(optimizer = "nlminbwrap"))					

Model statistics:

C-Index	Somers' D_{xy}	AIC	BIC	logLik	deviance	*df*
.9725	.9450	1508.6	1550.6	-746.3	1492.6	1401

Scaled residuals:

Min	1Q	Median	3Q	Max		
-6.4878	-.4304	-.1353	.3863	2.4744		

Random effects:

Groups	Name	Variance	*SD*	χ^2	*p*	
source	(Intercept)	4.154	2.038	117.31	<.0001	***

	Number of observations:	1409				
	groups:	809				

Fixed effects:

	Estimate	*SE*	*Z*	*p*	
(Intercept)	1.6675	.2316	7.199	<.0001	***
MOD_TYPE=deont	-1.9015	.3225	-5.896	<.0001	***
MOD_TYPE=dyn_poss	-2.0189	.2485	-8.123	<.0001	***
MOD_TYPE=epist	-4.8057	.4955	-9.698	<.0001	***
SYLL_COLL=three	-4.6318	.8162	-5.675	<.0001	***
SYLL_COLL=two	-2.6531	.3376	-7.859	<.0001	***
VNC_PERIOD=1830–1859	-.7121	.2703	-2.635	.0084	**

In all three cases, the reference levels were set to the outcome that was expected to increase the odds for the respective contraction based on the DCA results and a preliminary observation of the data. For the first case this means that the intercept shows the log odds (1.6675) for [*can't* V] over *cannot* V with a monosyllabic slot filler in contexts expressing 'ability' in the period 1900–2009; see Table 4.6. The estimates for the remaining coefficients indicate that these factor levels decrease the odds for the contraction significantly (other variables being controlled for). Perhaps unsurprising is the

full form's clear preference for epistemic contexts, given that its most distinctive collexeme throughout every VNC period is the high frequency verb *be* which in combination with (negative) *can* typically conveys 'assertion' when used statively (Coates 1983: 44, 101).

Table 4.7.   Results from the GLMM for [*won't* V]

Call:

glmer   (cxn ~ mod_type + syll_coll + VNC_period + (1 | source), family = binomial, data = wont, glmerControl(optimizer = "bobyqa"))

Model statistics:

C-Index	Somers' D_{xy}	AIC	BIC	logLik	deviance	*df*
.9569	. 9139	1580.8	1612.6	-784.4	1568.8	1483

Scaled residuals:

Min	1Q	Median	3Q	Max		
-4.1351	-.5287	.1876	.4285	5.7447		

Random effects:

Groups	Name	Variance	*SD*	χ^2	*p*	
source	(Intercept)	2.99	1.729	149.24	<.0001	***

Number of observations: 1489
groups: 782

Fixed effects:

	Estimate	*SE*	*Z*	*p*	
(Intercept)	1.5799	.1907	8.286	<.0001	***
MOD_TYPE=deont	-1.3337	.6656	-2.004	.0451	*
MOD_TYPE=dyn	-.9119	.1753	-5.201	<.0001	***
SYLL_COLL=two	-3.8684	.3448	-11.221	<.0001	***
VNC_PERIOD=1830–1859	-1.2393	.2501	-4.954	<.0001	***

As shown in Table 4.7, in the case of [*won't* V], we can also observe that monosyllabic slot fillers in the VNC period 1900–2009 increase the chances for the contraction (estimated log odds for the intercept: 1.5799); only this time, it is the contraction rather than the full form that favors epistemic contexts, while deontic and dynamic contexts significantly increase the chances for *will not* V. The model thus confirms an earlier assumption based on the DCA results from Table 4.3 that the increasing number of verbs conveying 'permission' or 'refusal' for which the full form has become more distinctive may be indicative of its relative preference to express '(un-)willingness'.

Finally, consider the GLMM results for [[SUBJ *'d*] V] and SUBJ *would* V in Table 4.8. Epistemic contexts, bi- and terasyllabic collexemes, inanimate and second as well as third person subjects increase the odds for the full form, which means, conversely, the

contraction prefers dynamic contexts, monosyllabic collexemes and animate, first person subject hosts (estimated log odds for the intercept: 2.5871). Interestingly, there is no discernable effect of TIME, that is, neither the sense distribution nor any subject preferences have significantly changed over the two VNC periods. Again, this is somewhat in line with results from the DCAs (see Table 4.4), where it was specifically SUBJ *would* V that remained almost static regarding its most distinctive collexemes across time.

Table 4.8. Results from the GLMM for [[SUBJ*'d*] V]

Call:

glmer (cxn ~ mod_type + syll_coll + SUBJ_pers + SUBJ_animacy + (1 | source), family = binomial, data = SUBJ_d, glmerControl(optimizer = "bobyqa"))

Model statistics:

C-Index	Somers' D_{xy}	AIC	BIC	logLik	deviance	*df*
.9411	.8822	1334.4	1382.4	-658.2	1316.4	1521

Scaled residuals:

Min	1Q	Median	3Q	Max
-6.3229	-.5115	-.0778	.3831	5.623

Random effects:

Groups	Name	Variance	*SD*	χ^2	*p*	
source	(Intercept)	1.169	1.081	19.66	<.0001	***

Number of observations:	1530	
groups:	1044	

Fixed effects:

	Estimate	*SE*	*Z*	*p*	
(Intercept)	2.5871	.2398	10.787	<.0001	***
MOD_TYPE=epist	-1.3973	.1961	-7.124	<.0001	***
SYLL_COLL=four	-.5592	1.5490	-.361	.7181	ns
SYLL_COLL=three	1.9785	.9236	2.142	.0322	*
SYLL_COLL=two	-2.7063	.4903	-5.520	<.0001	***
SUBJ_PERS=2nd	-.7290	.2529	-2.883	.0039	**
SUBJ_PERS=3rd	-2.2856	.2544	-8.985	<.0001	***
SUBJ_ANIMACY=inanimate	-3.4914	.4924	-7.091	<.0001	***

Essentially, all three GLMMs thus show, among other things, significant differences between contractions and full forms in terms of their modal functions. The model fits are very good, considering that the C-index of concordance is larger than .9 for each case, which indicates outstanding discrimination (Hosmer & Lemeshow 2000: 162). Yet, it

should be kept in mind that these results explain the choice of these contractions over their full forms in combination with their respective most distinctive collexemes, that is, they generalize across these specific combinations and highlight the differences. Admittedly, this provides a somewhat narrow view, as the results say nothing definitive about the constructional typicality of the contractions (or their full forms), namely whether, for example, [*won't* V] is epistemic in nature overall. Based on the present results, any claims regarding the functional (or other) preferences of these modal contractions can only be made relative to their respective competing forms. Nonetheless, the differences and changes observed here are still real and this approach models at least part of the knowledge speakers have of these cxns.

4.4   From contractions to constructions

Given the constructionist and diachronic treatment of the modal contractions presented here, the next logical step is to relate the previous findings from Section 4.3 to the discussion on constructional change which, according to Hilpert,

> selectively seizes a conventionalized form-meaning pair of a 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 2013a: 16)

As already established in Section 4.3.1, all contractions are structurally idiosyncratic, that is, in terms of their morphology, they do not conform to any predictable pattern. However, according to the OED, the earliest written attestations of these contractions date back to the 17th century and thus lie clearly outside the scope of COHA. The coalescence, although it has certainly happened at some point, can therefore not be addressed empirically with the data at hand and must simply be taken as given.

Functionally, each contraction favors a specific modal context relative to its full form; for example, [*won't* V] favors epistemic contexts in PDE, while its full forms can be associated rather with contexts signaling dynamic volition. Moreover, for both negative contractions, it was shown that their functional preferences have changed over time (relative to their full forms), which would clearly qualify as constructional change. In the case of [[SUBJ *'d*] V], such an effect was absent from the data. Here, the contraction already had and has maintained its distinctive functional preferences.

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Arguably, the most notable changes observed here relate to the contractions' usage frequencies. Assuming that frequency is essential to linguistic knowledge (which is widely accepted in usage-based theories of language), then regardless of whether contractions are treated as cxns or not, the significant increases in their relative frequencies could reflect a re-arrangement of the mental representation(s) of these forms and can therefore in either case be considered instances of constructional change (cf. Hilpert 2013a: 207). Similarly, the changes in the collocational behavior of the expressions investigated here indicate constructional changes related to frequency, whereby the mutual attraction between a contraction (or its full form) and its distinctive collexemes is altered over time. All three contractions exhibit clear differences in their collostructional behavior between the first and last VNC periods with a general tendency to increasingly attract cognitive and emotive verbs.

Furthermore, Hilpert proposes that constructional change may also manifest in a cxn's distributional changes in the linguistic community (Hilpert 2013a: 17). Up to now, the present study has only focused on fictional texts, but a closer look at the other genres for which COHA provides material indicates that the contractions have become relatively more prominent in all of them, as illustrated in Figure 4.6. The trends in the respective developments in relative frequency are summarized in Table 4.9.
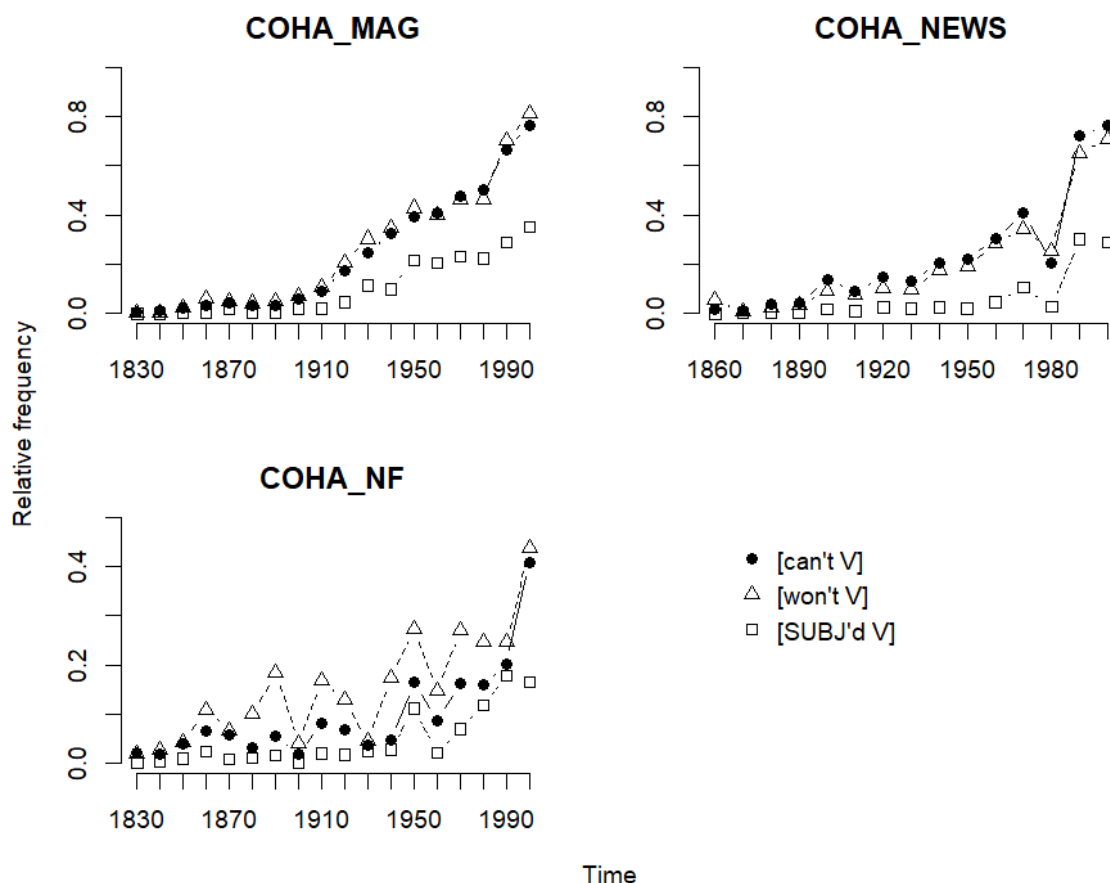
Figure 4.6. Changes in the usage frequency of [*can't* v], [*won't* v] and [[SUBJ*'d*] v] relative to their full forms in different written genres; COHA

Table 4.9. Trends in the relative development of [*can't* v], [*won't* v] and [[SUBJ*'d*] v] in different written genres; COHA

	[*can't* v]		[*won't* v]		[[SUBJ*'d*] v]	
	r_T	$p_{two\text{-}tailed}$	r_T	$p_{two\text{-}tailed}$	r_T	$p_{two\text{-}tailed}$
MAG	.97	<.0001	.93	<.0001	.87	<.0001
NEWS	.87	<.0001	.87	<.0001	.85	<.0001
NF	.61	.0002	.65	<.0001	.74	<.0001

In all genres, the contractions exhibit strong, significant increases in their use relative to the full forms, thus providing further evidence of constructional changes. Over the course of the 19th and 20th century, the trends are most notable in magazines and newspapers (cf. Millar 2009: 211–212). Such developments have generally been associated with colloquialization (cf. e.g. Leech 2003: 236; Leech et al. 2009: 239–249) and/or loosening of editorial style conventions (e.g. Millar 2009: 212).

Most importantly, Hilpert notes that constructional changes have to be distinguished from systemic changes, that is, changes that affect language on a global

level, such as the Great Vowel Shift or the massive loss of English inflections since Old English as a result of language contact (Hilpert 2013a: 13–14, 205). The changes recorded in the present study are clearly not of that magnitude and, despite some similarities in the development of their distinctive collostructional behavior and their overall increase in relative usage frequency, each contraction has (developed) its own functional preferences, thus supporting a constructional treatment of the changes at hand.

Thus far, it has been proposed that the developments reported in this study constitute a series of constructional changes. The remaining questions are whether the data also support the idea that the contractions investigated here may in fact be regarded as cxns distinct from their respective full forms and whether it is possible to pinpoint the moment of constructionalization (Traugott & Trousdale 2013: 1).

To answer the first question, all aspects mentioned up to this point need to be taken into consideration. From a PDE perspective, [*can't* V], [*won't* V] and [[SUBJ *'d*] V] all exhibit idiosyncratic formal properties, specific collocational and functional behavior that differs from their source forms and they are found across all written and spoken genres. Additionally, the contractions' emancipation appears to be in full progress as evidenced by their significant increases in (relative) usage frequency. In combination, these results lend weight to this paper's central claim that the contractions investigated here may be regarded as cxns. Moreover, these contractions also pave the way for other lexically more specified chunks (so-called prefabs) that take on new (possibly discourse-like) functions (cf. Bybee & Scheibman 1999); for example, *I can't help (but)* VP, *Can't say I* VP, *That won't do* or *I'd say*.

The second question cannot be answered straightforwardly (if at all) on the basis of the data at hand. (Gradual) constructionalization is defined as the emergence of a new node in the construct-i-con, that is, when a new form combines with a new meaning, and it is typically preceded and followed by a succession of constructional changes (pre-constructionalization and post-constructionalization respectively) feeding into one another (Traugott & Trousdale 2013: 22–29). Although the definition is lucid, applying it to the present data raises a few issues. To illustrate, the first textual appearance of the contractions (at least according to the OED) predates their first COHA entry by at least 150 years, which means that the morphological change was already completed by that time. However, given the unavailability of corresponding corpus data, this time gap represents a kind of black box, meaning that it remains uncertain (for now) whether there were any meaning changes during that period. As a consequence, it is not possible to

determine conclusively whether the data from COHA represent either the pre- or post-constructionalization stage of the contractions. This is complicated further by the fact that it is not clear at what point the label 'new meaning' is well deserved. In either case, it is proposed here that the contractions will have received their own lexical entry as soon as they survived their initial on-off use, that is, once the contractions stabilized, a network as depicted in Figures 4.1 and 4.2 may potentially be assumed. While these contractions may have initially been perceived as pure pronunciation variants with the same meanings as their source forms, it seems as if their unpredictable formal properties facilitated an increasing dissociation from them (hence the opaque subpart links in the network models), which essentially led to the functional divergences discussed in Sections 4.3.4 and 4.3.5.

Furthermore, Traugott & Trousdale exclude frequency as a factor from their analyses (Traugott & Trousdale 2013: 11), which means that the bulk of the results from the present study can simply not be integrated into that discussion. However, recent studies on emerging modals, most notably Lorenz (2013a, 2013b, 2013c), have assigned a key role to usage frequency in the emancipation process of a contracted form. In his model, emancipation involves, among other things, a formal change (beyond online phonetic reduction and univerbation) and functional divergence (Lorenz 2013c). This is quite similar to Traugott & Trousdale's (2013) notion of constructionalization. By contrast, the driving forces behind emancipation are absolute and relative frequency; an increase in the absolute frequency of a contracted form initiates the process of emancipation and an increase in its relative frequency marks its progress (Lorenz 2013a: 33–40, 232–235). With this in mind, the constructionalization of the contractions investigated here is perhaps more likely to have happened within the time frame of COHA, more specifically in the 19th century. Until the 1910s, each contraction has more than tripled its relative frequency of use (cf. Figure 4.3), while the following decades are marked by stagnation. The functional divergence is also evident in all three cases, with the negative contractions having changed their relative preferences from the beginning of the 19th to the 20th century. The enclitic differs in this regard; the functional distinctiveness already existed prior to its increase in relative usage frequency. However, Lorenz notes that the different stages of the emancipating process need not happen one after the other but may in fact overlap (Lorenz 2013a: 235). Whether or not the constructionalization of the modal contractions did in fact take place in the 19th century

(or before that) is still speculative, but perhaps it would be even more so if frequency was not taken into consideration.

4.5 Concluding remarks

In this study, I hope to have shown that, from a constructionist perspective, it might be worth entertaining the idea that (some) modal contractions, namely [*can't* V], [*won't* V] and [[SUBJ*'d*] V], represent distinct cxns rather than semantically identical, colloquial variants of their respective full forms. For each case presented here, a detailed account of their respective formal idiosyncrasies, collocational behavior, distinctive functional preferences and distributional changes has been provided. It was argued that the multi-facetted developments of [*can't* V], [*won't* V] and [[SUBJ*'d*] V] constitute a series of constructional changes. Moreover, when all aspects are considered in combination, they amount to the contractions' constructionalization; although, it remains not fully clear when this actually took place (at least the corpus data at hand cannot give too much indication of that, even if frequency is taken into consideration).

The constructionhood of the modal contractions was addressed empirically by means of different quantitative methods (e.g. VNC, DCA, GLMM). These helped identify structure and subtleties in the data that arguably could not have been detected using a more conservative, intuition-based approach. They also provided different perspectives on the data and facilitated an investigation of the different types of constructional change.

Apart from having focused on three case studies only, a potential shortcoming of this paper is perhaps that there is no experimental validation of the results. If speakers do in fact store and process these contractions holistically as cxns, this hypothesis should stand up to testing under laboratory-controlled environments. Although corpus-based studies do not in general necessitate the employment of complementing experiments, it seems that any study that either implicitly or explicitly investigates linguistic knowledge as represented in the minds of speakers should consider actually investigating the minds of speakers.

Finally, I would like to point out possible implications the findings of the present study have on future studies on the English modal system. If a linguist accepts the degree of granularity which results from treating (at least some) contracted variants as cxns in their own right, methodologically, it follows that aggregated frequency counts of, for

example, *will*, *'ll*, *will not* and *won't* under one umbrella cxn WILL becomes problematic, as this would fail to adequately describe the underlying heterogeneity of this set of expressions. This also entails that we may eventually be confronted with what Wärnsby (2002: 7) has skeptically referred to as "a bewildering web of [modal] constructions", but perhaps this comes with the territory; as Trousdale (2016: 54) points out "the modals are a particularly messy category".

5   English modal enclitic constructions: A diachronic, usage-based study of *'d* and *'ll*

Abstract

English modal enclitics (*'d* and *'ll*) are typically conceived of as colloquial pronunciation variants that are semantically identical to their respective full forms (would and will). Although this conception has already been challenged by Nesselhauf (2014) and Daugs (2021), who argue for the constructional status of both enclitics, the present study proposes a refinement according to which the differences between enclitics and full forms can be pinpointed to specific co-occurrence patterns. Rather than rashly postulating a general *'d*-construction or an *'ll*-construction, the data indicate that lower-level instances, like *I'd* v, *we'll* v, or *it would* v, are very much capable of capturing the meaning differences between enclitics and full forms without recourse to higher, more abstract level. This is achieved by assessing the changes in the associative links these patterns entertain in a data-driven, bottom-up fashion. By utilizing the COHA and a variety of quantitative methods, it can be shown that, although enclitic patterns become more frequent and more varied, they remain overall still more restricted than the full forms, which promotes the emergence of 'new' symbolic associations. The results are integrated into current research in Diachronic Construction Grammar (Hilpert 2013a, 2021) and dynamic, network-oriented models of language (Schmid 2020).

5.1 Introduction

Contractions like *let's* (*let us*) or *we've* (*we have*) are pervasive in language use and typically result from a string's increase in usage frequency (Bybee 2006; Bybee & Scheibman 1999; Ellis 2002; Krug 1998, 2003). Through repeated co-occurrence, the syntagmatic associations between the adjacent items in a string are strengthened, causing it to become increasingly entrenched as a holistic unit (Langacker 1999: 93–95; Schmid 2017: 11, 16–18). The string's entrenchment on the level of the individual speakers contributes to its conventionalization on the collective level, which, pending further repetition, can eventually lead to coalescence (Schmid 2020: 161, 325–337). Such coalesced forms are not just chunked to form single processing units, as in, for example, *needless to say* or *I mean*, but they have also ceased to retain their original internal structure; compare, for example, *do not* vs *don't* or (BE) *going to* vs *gonna*.

The English modal enclitics *'d* and *'ll* also constitute cases of coalescence. These have emerged from their respective full forms *would* and *will* via reduction and fusion with their preceding (pronoun) subjects (e.g. *I will > I'll*, *you would > you'd*) and represent institutionalized contractions in Present-Day English (PDE). Major reference grammars (Biber et al. 1999; Huddleston & Pullum 2002; Quirk et al. 1985) typically refer to these enclitics as highly colloquial pronunciation variants that, apart from their specific morphosyntactic distributions, are not markedly different from their respective full forms regarding their meaning. This assessment is also mirrored in many corpus-based studies on modal verbs, where frequency counts for a given contracted/uncontracted modal pair are typically conflated instead of being addressed separately. Although discernible overlap in the use of enclitics and full forms can be expected, which would support the assumption for a common generalization speakers form over them, a growing body of research indicates that they do not pattern fully congruently regarding, for example, their subject and infinitival verb preferences (Berglund 2005), their adverbial collexemes (Flach 2020a) or preferred syntactic environments (Szmrecsanyi 2003). Furthermore, for *'ll*, Nesselhauf (2014) has claimed that the enclitic should be conceived of as a construction (i.e. a form–meaning pairing; cf. Croft 2001; Goldberg 1995, 2006) in its own right that, compared to *will*, has not only been on a different path in terms of its diffusion across time, but it has also developed a distinct meaning structure. A similar argument is proposed by Daugs (2021) for the case of *'d*. The present study generally agrees with these assessments but seeks to refine them

by looking more closely at the interaction between the enclitics' subject hosts and their collocating verb infinitives, which has been neglected in previous research.

Beyond the well-known differences in the pragmatic associations enclitics and full forms evoke, which are evident from the preferred use of the former in informal contexts, the present study proposes that *'d* and *'ll* also differ from *would* and *will* respectively in terms of the syntagmatic, paradigmatic, and (in part) symbolic associations speakers have routinized regarding each form (for a detailed discussion on the different kinds of associations, see Schmid 2015: 11–15; Schmid 2020: 45–49). Put differently, the use of enclitics relative to their full forms is not merely contingent on contextual cues about register variation, but also their respective co-occurrence patterns (i.e. the elements with which the enclitics occur in a sequence) and paradigmatic range (i.e. the number of elements in the variable slots of enclitic patterns). Assuming that the elements in the enclitics' immediate co-text, namely the subject host and the following verb infinitive, make a substantial contribution to the meaning(s) conveyed by the respective sequences as a whole, significant distributional differences in these elements should provide us with an approximation of how enclitics differ from their full forms regarding their semantics. Given the historical relatedness between enclitics and their full forms it stands to reason that there will not likely be a clear-cut distinction between these patterns — but arguably enough to argue for a separate treatment on both conceptual and methodological grounds. This will be tested empirically with data obtained from the *Corpus of Historical American English* (COHA; Davies 2010).

The guiding question is whether speakers form a common generalization over enclitics and full forms, or generally conceive of them as separate constructions (e.g. a *will*-construction and *'ll*-construction, as proposed by Nesselhauf 2014), or whether the answer lies somewhere in between, where possible generalizations exist at a lower level of specificity. To address these issues, the study adopts a usage-based perspective (e.g. Bybee 2006, 2010) and draws on ideas from Hilpert's (2013a) strand of Diachronic Construction Grammar (DCxG) as well as Schmid's (2015, 2020) Entrenchment-and-Conventionalization Model (EC-Model). The frameworks are generally compatible with each other and allow one to highlight different aspects about the changes at hand. This will be elaborated on in Section 5.2, where I will also establish the theoretical background on English modal enclitics. Sections 5.3 introduces the corpus data and the methods utilized for this study. The data on the enclitics' general development and the changes in their variable slots are then addressed in Section 5.4. Finally, Section 5.5 evaluates the

results and this study's contribution to understanding the intricacies of the alternation between contractions and full forms and the status of enclitics within the modal system.

5.2 Theoretical background

Much research on English (modal) enclitics has been devoted to understanding their prosodic, morphophonological and syntactic properties (Bresnan 2021; Szmrecsanyi 2003; Halpern 1998) as well as their role in grammaticalization theory (e.g. Fischer 2007; Hopper & Traugott 1993). This section briefly rehearses the status of *'d* and *'ll* as stored lexical entries and lays the foundation for distinguishing between the enclitics and their full forms in a principled way by treating them as variable patterns of associations (cf. Schmid 2015, 2020).

Arguably, one of the most intriguing characteristics of English modal enclitics is their fusion with the subject rather than the following verb infinitive, despite an expected functional cohesion with the latter. Among other things, two frequency effects may account for this phenomenon: (i) a string frequency effect (Krug 1998), according to which the likelihood of a subject and a modal to coalesce is based on their conjoined frequency rather than the modal's individual absolute frequency, and (ii) a possible frequency asymmetry (Bybee 2002), according to which the most frequent SUBJ + MOD combinations may be more frequent than the most frequent MOD + V combinations and will therefore more likely coalesce. Because the first attestations of both enclitics date back to the late 15th, early 16th century (see e.g. Nesselhauf 2013; OED s.v. *will* v.1), frequency asymmetries will no longer have much bearing on *would* and *will* in PDE, as the direction of the contraction is fully conventionalized.

Their high degree of conventionalization is also supported by their invariant phonetic realizations (*'d* > [(ə)d]; *'ll* > [(ə)ɫ]) and the fact that their use is not restricted to rapid speech, which strongly suggests lexical storage of these forms (Bresnan 2021: 116–117; Wescoat 2005). Especially for *I'll* and *we'll*, the univerbation process between the pronouns and the enclitic has advanced to a stage such that the source forms are arguably no longer fully recognizable; compare [aɪɫ] and [ɑɫ] or [wiːəɫ] and [wɪɫ]. Because English has no productive morphophonological deletion pattern that involves suppletion and substance loss, it is questionable that speakers can fully predict these sequences, unless they utilize other cues, like common distributional properties. It has to be kept in mind,

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however, that enclitics show well-known morphosyntactic constraints which are not inherent to their full forms; for example, loss of interruptibility (e.g. *They certainly'd like that.*), inability to be used in inversion (e.g. *'ll I see you tomorrow?*), or unavailability in ellipses (e.g. *She hasn't done it yet, but she'll.*) (cf. Haspelmath 2011; Krug 2003; Quirk et al. 1985: 123). In fact, the latter constraint exposes an important, general property of enclitics, namely that they lack autonomy, that is, they typically require both their subject host and the following verb infinitive. Although modifications are possible, for example, adverb insertion between the enclitic and the verb, Flach (2020b) has already shown that neither *'d* and *would* nor *'ll* and *will* behave alike in this regard, considering that combinations like SUBJ*'d rather* V, SUBJ*'ll just* V, and SUBJ*'ll never* V are highly idiomatic for the respective enclitic but not its full form. Thus, if anything, free variation, at least in theory, may only be possible for the syntactic configuration in (25).

(25) a. [[SUBJ*'d*] V] < > SUBJ *would* V
     b. [[SUBJ*'ll*] V] < > SUBJ *will* V

The brackets indicate that (i) the syntagmatic associations likely evoked between a subject and an enclitic is stronger than in the case of its respective full form, hence the cliticization, and (ii) the verb infinitive is usually obligatory.[55] Apart from that, there do not seem to be any obvious semantic constraints pertaining to only one member of a pair but not the other, which means we have to assume that they have the same meaning potential. Indeed, the examples in (26) and (27) show that the familiar meanings of *would* and *will* can also be conveyed using the respective enclitic patterns (for overviews, see e.g. Coates 1983: Ch. 7–8; Collins 2009: Ch. 5).[56]

(26) a. [H]e gave me a lead pencil and he said he**'d** help me take the car back to Mr. Bartlett […]. [COHA, Pee-WeeHarrisOn, 1922]

'past volition' (dynamic)

   b. If you should fall, I**'d** pick you up, of course, and put you on your feet again. [COHA, FastFolks, 1861]

'volition/hypothetical' (dynamic)

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[55] The modal idiom SUBJ*'d rather* is a notable exception to this claim, since it can be followed by the negative particle without a following verb, as in *I'd rather not*.
[56] Note that 'futurity' is not listed explicitly in (3), despite *will* being the main future marker of English. Following Coates (1983: 167) and Huddleston & Pullum (2002: 188–190), 'futurity' is considered here to cut across the modal meanings conveyed in the examples.

    c.   He thought to ask her why she decided to leave Israel, or about her work, but he was afraid <u>she**'d** feel</u> he wasn't really interested. [COHA, Tribunal, 1999]

<div align="right">'past prediction' (epistemic)</div>

    d.   <u>It**'d** be</u> a pity if this particular part of it was blown to hell. [COHA, Analog, 1997]

<div align="right">'prediction/hypothetical' (epistemic)</div>

(27)   a.   Why don't you guys grab some dinner at the Thai place? <u>I**'ll** meet</u> you there as soon as I can. [COHA, Mov:Hostage, 2005]

<div align="right">'volition' (dynamic)</div>

    b.   You'll be going to places very far off with no one to talk to, <u>it**'ll** seem</u> very quiet. [COHA, Greenwillow, 1956]

<div align="right">'prediction' (epistemic)</div>

    c.   Not only are you not coming after him <u>you**'ll** make</u> sure he lives a long, healthy life. You just became his godfather. [COHA, Angel, 2001]

<div align="right">'obligation' (deontic)</div>

While such examples confirm the common meaning potential of enclitics and their full forms, they do not provide any indication of the characteristics of that potential, that is, how it is truly realized in actual language use. What is proposed here is that enclitics and full forms differ regarding their sense distribution. This in itself is not a novel claim. As argued in Daugs (2021), *would* is used over *'d* to express epistemic meaning more often than would be expected by chance, while the enclitic shows a preference for contexts conveying 'dynamic volition'. For *'ll* and *will*, Nesselhauf (2014) finds that the enclitic has developed a meaning in British English that is only rarely expressed by the full form, namely 'spontaneous decision' (cf. also Carter and McCarthy 2006: 632). Accordingly, both studies point to the general constructional status of *'d* and *'ll* in PDE. Although the present study does not generally call this into question, it proposes a refinement whereby the semantic distributional differences between the enclitics and their full forms may manifest at a lower level of specificity. By adopting a rather radically usage-based perspective, enclitics can be approached in a bottom-up, data-driven fashion that puts special emphasis on (changes in) their associative connections. This shifts the focus away from large(r) abstractions, for example, a general *'ll*-construction, to lower-level sequences like *I'll* V and *we'll* V and allows us to test where exactly enclitics and full forms diverge from one another.

     Usage-based linguistics further assumes that speakers act as 'intuitive statisticians' that have probabilistic knowledge about the distributional properties of language (e.g.

Diessel 2007; Ellis 2006; Taylor 2012). Previous studies on modals, most notably, Budts & Petré (2020), Hilpert (2016a), and Hilpert & Flach (2020), have capitalized on this notion and have shown its importance for identifying the emergence of category membership (e.g. the inclusion of periphrastic DO as part of the modal paradigm), tracing changes in modal meaning (e.g. the shift from deontic *may* to epistemic *may*), and differentiating the meanings of near-synonymous modal expressions (e.g. *must* and HAVE *to*). The logic goes as follows: variation and change in the use of modal(-like) expressions are roughly concomitant with the strengthening or weakening of connections in an associative network (cf. Diessel 2019; Goldberg 2019; Hilpert 2018, 2021; Schmid 2015; 2020). Differences in the use of given utterance types are thus understood in terms of probabilistic preferences reflecting the strength of the different kinds of associations.

In the present context, we can thus quantitatively test whether and how enclitics and their full forms differ regarding the distributional properties that concern the patterns as whole, their co-occurring elements, and the elements in the variable slots. Moreover, it is possible to monitor the enclitics' frequency profiles, collocational preferences or communal spread across time. From a DCxG perspective, any such changes may be understood as symptoms of constructional change, whereby the associative network is reorganized (Hilpert 2013a, 2018, 2021). Whether and how this has potentially affected the use of enclitics and their full forms over the past ~200 years will be tested in the following sections.

5.3   Corpus data and methods

The analyses are based exclusively on data extracted from a CQP-transformed version of the commercially available ~400 million word COHA (written American English [AmE], 1810–2009).[57] Three restrictions were imposed. The first restriction concerns genre. Although COHA does provide data from fictional texts, newspaper articles, popular magazines and non-fictional books, the focus will rest on the fiction section (FIC) only. Seeing that the use of contractions is highly skewed towards informal discourse,

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[57]   The   following   CQP   query   was   used: [class="PRON" |
word="this|that|these|those|which|what"%c]   [word="will|'ll|would|'d"%c   &   pos="vm"]
[pos="v.i"]. Subsequently, the data were cleaned up semi-automatically. Furthermore, archaic pronouns (*thy*, *ye* etc.) were changed to their respective PDE analogues and regional/dialectal or colloquial variants (e.g. *youse*, *dey*) were standardized. For details on the Corpus Query Processor (CQP), see https://cwb.sourceforge.io/.

comparisons between enclitics and full forms across all sections in COHA may conflate genre differences with potential genuine meaning differences between these forms (cf. Biber & Gray 2013). Keeping genre constant should therefore reduce the noise in the data to a considerable extent. Also, the influence of any prescriptive usage norms on actual language use, which has been found to be minuscule in general (Anderwald 2016), will probably have no effect on fictional writing, making this genre an ideal testing ground for an inquiry into the usage patterns of enclitics. The second restriction pertains to the decades selected for this study. A preliminary investigation of the data from the 1810s and 1820s eventually led to their exclusion from the analyses. The rather erratic nature of the results from these decades are assumed to be an artefact of their relative data sparseness and composition. The third restriction is linguistically motivated and concerns the subject slot in the respective patterns. For three reasons, the focus will rest on pronominal slot fillers only: (i) in the SUBJ + MOD + V sequence, pronouns are the most common subjects (or hosts) for both enclitics and their full forms, (ii) non-pronominal slot fillers (e.g. common nouns, proper nouns, gerunds) are highly biased towards full forms and therefore less informative when investigating the variation between them and the enclitics, and (iii) qualitative changes in this slot can be assessed more straightforwardly for pronouns because semantic properties, like animacy, which is known to correlate highly with specific modal meanings, are hard-coded into most of them rather unequivocally.

The development of English enclitic constructions in COHA was assessed by utilizing a variety of different methods suitable for unearthing changes in semi-filled variable patterns.[58] Next to coarse-grained (relative) frequency changes in the use of *'d* and *'ll* across time, changes in the distribution of their subject hosts will be investigated, using normalized entropy, a dispersion measure for categorical variables (Gries 2021: 95–96). This allows us to trace whether the overall development of an enclitic has been facilitated by changes in the variability of the SUBJ slot, which, in turn, may provide qualitative insights into the construction's schematic representation (cf. Flach 2017b, 2020b). Following this, the respective V slots will receive attention. These were analyzed by means of *extrapolated potential productivity*, a measure based on LNRE (i.e. large number of rare events) models that draw on Zipf-Mandelbrot distributions (Baayen 2008; Baroni & Evert 2005, 2014). Tracing the productivity of enclitics across time provides an

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[58] All data analyses and visualizations were conducted using R (R Core Team 2018).

approximation of how readily speakers use this pattern with verb infinitives that have not been used with it before. In usage-based frameworks, this is typically directly associated with schema entrenchment (Barðdal 2008: 45; Bybee 2010: 67; Croft 2001: 28). Finally, each pattern was submitted to distinctive co-varying collexeme analyses (DCCA; Stefanowitsch & Flach 2020: 267–270), an extension of traditional co-varying collexeme analysis (Stefanowitsch & Gries 2005). In this way, we can explore changes in the alternation of competing patterns with multiple slots (here enclitics vs full forms) on the basis of the items (here SUBJ and V) they attract or repel more often than expected by chance. As any other collostructional method, DCCA is based on contingency information, that is, it abstracts away from raw frequencies and can help find combinations that are prototypical or highly idiomatic for given pattern, thus providing access points to the pattern's semantics.

The results obtained from these methods and their linguistic implications are presented in the following sections. Whenever necessary, additional methodological details will be provided alongside the findings.

5.4   Constructional changes in enclitics

Based on the data obtained, the following sections flesh out the different changes both enclitics underwent over the past two centuries in AmE. This lays the groundwork for the general discussion where it will be argued that the respective developments uncovered here are most likely constructional changes, considering that there is less uniformity in how they unfold than may be expected if common, systemic factors were to play a key role. The selective nature of the changes at hand is crucial because not every change that constructions are involved in is constructional change by definition (Hilpert 2013a: 8–17).

5.4.1   The rise of enclitics in AmE

The first assumptions to be tested is whether enclitics (i) have generally become more prominent in AmE and (ii) show signs of emancipation from their full forms in terms of usage frequency. To provide a general overview on the enclitics' diachronic frequency profiles, both in absolute terms and relative to their full forms, consider the plots in

Figure 5.1. These show the changes in usage frequency (per million words) in COHA (FIC).
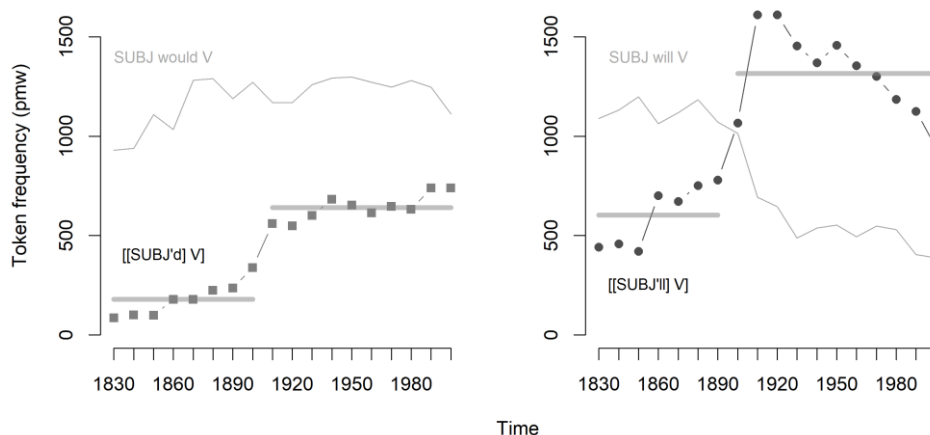
Figure 5.1. Frequency profiles of [[SUBJ*'d*] V] (left panel) and [[SUBJ*'ll*] V] (right panel) and their corresponding full forms in COHA (FIC); grey horizontal bars represent VNC-determined developmental stages

Perhaps not surprisingly, both enclitic constructions have become more frequent over the past ~200 years. However, their respective increases differ quite notably in terms of magnitude and longevity. The data for [[SUBJ*'d*] V] indicate a rather steady, highly significant increase between 1830 and 2009 (r_τ=.86, p<.0001), whereas [[SUBJ*'ll*] V] records an impressive initial rise that peaks in the 1910s, before eventually turning into a steep decrease, which amounts to merely a moderate overall increase across the entire time span (r_τ=.39, p=.0264).[59] Nonetheless, [[SUBJ*'ll*] V] continues to be generally much more frequent than [[SUBJ*'d*] V] and, unlike the latter, has even surpassed its corresponding full form after the turn of the 20th century, maintaining a relative frequency of roughly 70% of their combined usage shares from 1910 onwards. By contrast, [[SUBJ*'d*] V] remains still well below SUBJ *would* V with a relative frequency of roughly 40% by the 2000s. The full forms themselves behave rather differently altogether. While SUBJ *would* V shows no discernible shifts in its usage frequency (r_τ=.29, p=ns), SUBJ *will* V exhibits a marked decline (r_τ=−.75, p<.0001). Lastly, the plots point to the rates of the

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[59] As recommended by Hilpert & Gries (2009), the trends were assessed statistically using Kendall's r_τ, a non-parametric rank-correlation coefficient. Note that r_τ cannot distinguish between a non-monotonic relationship and no relationship. In this regard, the case of [[SUBJ*'ll*] V] is not unproblematic, considering the clear decrease after 1950. However, since the initial increase does not fall back on itself completely, the moderate r_τ-value calculated for the overall trend does some justice to this development (much more so than Pearson's *r* would, which measures the strength of a linear relationship).

changes in the use of enclitics on the quantitative dimension. A variability-based neighbor clustering analysis (VNC; Gries & Hilpert 2008) suggests a two-stage periodization (grey horizontal bars) for the development in the usage frequency of enclitics based on similarities in the data between adjacent decades.[60] Note that, in either case, the second period is longer than the first one, suggesting that the respective developments have already slowed down after a big leap around the turn of the 20th century.

Three preliminary conclusions may be drawn from these observations. First, the significant increases both enclitic constructions underwent provide a first approximation of their changing degree of conventionalization in AmE, that is, if we view the corpus data presented here from an output-oriented perspective (cf. Stefanowitsch & Flach 2017). In the case of [[SUBJ*'ll*] V], its use has become established to the extent that it is much more preferred than the form from which it has historically emerged. This convention is sustained as indicated by the consistency in its frequency relative to SUBJ *will* V in contexts where both are theoretically interchangeable. The developments of [[SUBJ*'d*] V] and SUBJ *would* V suggest that the enclitic has gained ground on the full form in terms of its relative degree of conventionalization but remains still less established overall. Second, the fact that both [[SUBJ*'ll*] V] and SUBJ *will* V are declining in their usage frequency over the course of the 20th while [[SUBJ*'d*] V] and SUBJ *would* V are not is indicative of a more vibrant competition in the onomasiological space of the former pair. In their case, the enclitic and its full form do not only compete against each other for selection but also with forms like BE *going to* and WANT *to*, as well as their corresponding contractions *gonna* and *wanna*, which continue to become increasingly conventionalized as well (cf. e.g. Aarts et al. 2009; Leech et al. 2009; Lorenz 2013a; Krug 2000). Third, considering that conventionalization is connected to entrenchment via usage (Schmid 2015: 19–21, 2020: 3–9), it is quite conceivable that both enclitics have also become more entrenched as patterns of associations on the level of the speaker.

This admittedly very rough first assessment requires some refining. Since this study does not look into usage patterns of individual authors/speakers in COHA, the shortcut from aggregated frequency data to entrenchment is conceptually precarious (Blumenthal-Dramé 2012; Schmid 2020: 216–218; Schmid & Mantlik 2015). In other words, a fully conventionalized utterance may not be entrenched at all for a specific individual. Idiolectal variation of this sort is acknowledged here but will play no further role.

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[60] In any case, the number of clusters was determined strictly based on the first point of inflection in the corresponding scree plots.

Assuming that COHA is a representative sample of AmE, aggregated frequency data should represent a good enough proxy for conventional uses of enclitics, which, in turn, can then reasonably be expected to be entrenched for many speakers as well (albeit to different degrees).

What is not clear yet is whether it is the repeated use of a few specific instances that is responsible for the enclitics' overall rise in AmE or the use of many different instances. Although the former seems less likely, considering that there do not seem to be many overt restrictions on the use of enclitics, aside from the ones discussed in Section 5.2, the issue on how exactly the patterns are conventionalized (and potentially entrenched) should be addressed empirically.

5.4.2 Changes in schema representation

The results from the previous section give rise to the suspicion that the significant increase in usage frequency may be connected to qualitative changes in the enclitic patterns, that is, the quantitative development may have either facilitated changes in the variable slots or may have been facilitated by them. In the following, the focus will therefore rest on the changing degrees of variability concerning the subject hosts and their following verb infinitives.

5.4.2.1 Shifts in subject host variability

Because the variation between enclitics and full forms was restricted to pronominal subjects, the category of potential fillers is clearly demarcated and therefore lends itself for a relatively straightforward qualitative assessment. The more variability we can observe in SUBJ + ENCLITIC combinations across time, the more flexible the enclitic will be used across different contexts, which then translates into a higher degree of conventionalization by means of syntagmaticalization of these combinations (Schmid 2020: 92–93, 128). Conversely, if SUBJ + ENCLITIC combinations show signs of declining variability, their use will be more specialized, and conventionalization may be restricted to but a few combinations. Figure 5.2 shows the changes in this variability for both enclitics and their corresponding full forms.
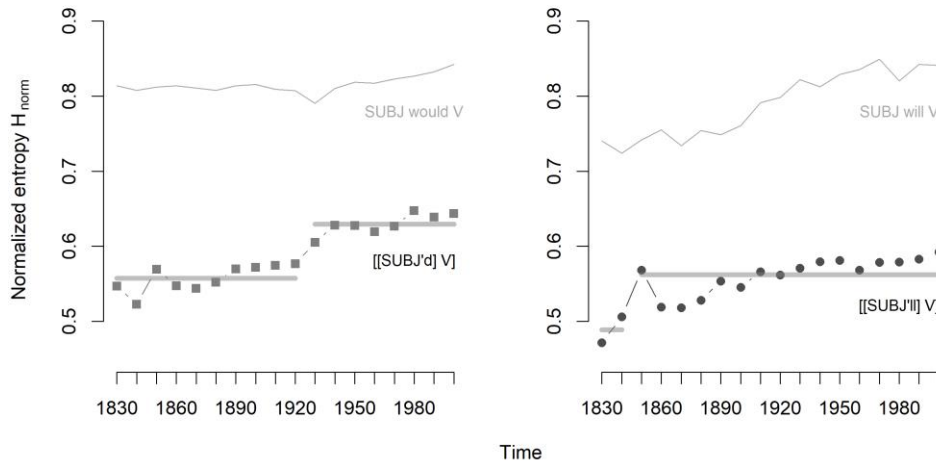
Figure 5.2. Changes in the dispersion (H_{norm}) of subject hosts of [[SUBJ*'d*] V] (left panel) and [[SUBJ*'ll*] V] (right panel) and their corresponding full forms in COHA (FIC) with VNC-determined stages (grey horizontal bars)

Along with the quantitative change discussed in Section 5.4.1, we can also observe qualitative changes in terms of greater subject (host) variability across time for both enclitics as well as their corresponding full forms, operationalized here as changes in normalized entropy H_{norm}. Values closer to 1 indicate a more even dispersion, meaning that a pattern is equally used with different pronouns; values closer to 0 indicate a distributional skew that would point to a clearer preference for specific SUBJ + ENCLITIC/FULL FORM combinations.

The two most obvious observations are that (i) full forms show a much higher degree of variability in the SUBJ slot than their cliticized counterparts across the entire time span, and (ii) the enclitic constructions clearly increase in their degree of variability. The first finding is intuitively plausible and corroborated by previous research, where enclitics were shown to be much more selective, occurring more readily with personal pronouns than, for example, demonstratives or interrogatives (Krug 1998). The second finding, on the other hand, indicates that this restrictiveness seems to be loosening, considering the significant increase in H_{norm} for both [[SUBJ*'d*] V] (r_τ=.83, p<.0001) and [[SUBJ*'ll*] V] (r_τ=.76, p<.0001). Also note that [[SUBJ*'d*] V] records slightly higher H_{norm}-values than [[SUBJ*'ll*] V] throughout, which points to a more even distribution of the subjects with which *'d* is used, while *'ll* remains relatively more skewed towards specific hosts with which it is preferably selected, especially *I*.

The data were again submitted to a VNC, according to which a two-cluster solution is recommended, as in the case of the quantitative development. Crucially, these clusters

differ in length considerably, not only regarding the respective stages of the qualitative development but also compared to the stages of the quantitative development. This puts us in the position to compare the rates of the changes on two dimensions, namely quantity and quality, by comparing the respective cluster lengths for each development (cf. Flach 2017b). In the case of [[SUBJ*'d*] V], the qualitative change in the SUBJ slot might not be the driving force behind the pattern's initial increase in usage because the second stage of its qualitative development starts two decades after the beginning of the second stage of its quantitative development (cf. Figure 5.1, left panel). That is not to say that the increased variability in the SUBJ slot may not have boosted the enclitic's increase in frequency at all, only that a true effect seems to have set in after the 1930s. The picture is different for [[SUBJ*'ll*] V], which has reached the second stage of its development in SUBJ slot variability much sooner than the second stage of its development in usage frequency (cf. Figure 5.1, right panel), thus suggesting that the former seems to have facilitated the latter. In this case, qualitative change predates quantitative change.

There is also an increasing variability observable for subjects preceding *would* (r_τ=.42, *p*=.0137) as well as *will* (r_τ=.80, *p*<.0001), which can be explained by the enclitics taking over parts of their shared onomasiological space. The reason why some SUBJ + ENCLITIC combinations (e.g. *I'd*, *you'll*) are more conventionalized than others in PDE is because their full form analogues (*I would*, *you will*) will have also figured prominently in earlier periods, more so than other combinations, which led to their cliticization in the first place. This prominence also entails a distributional skew, which, in turn, was gradually evened out by the enclitics and their respective full forms competing for selection. To have a closer look at which pairs are particularly affected, consider the distributional changes of selected SUBJ + ENCLITIC combinations relative to their full forms in Figure 5.3.
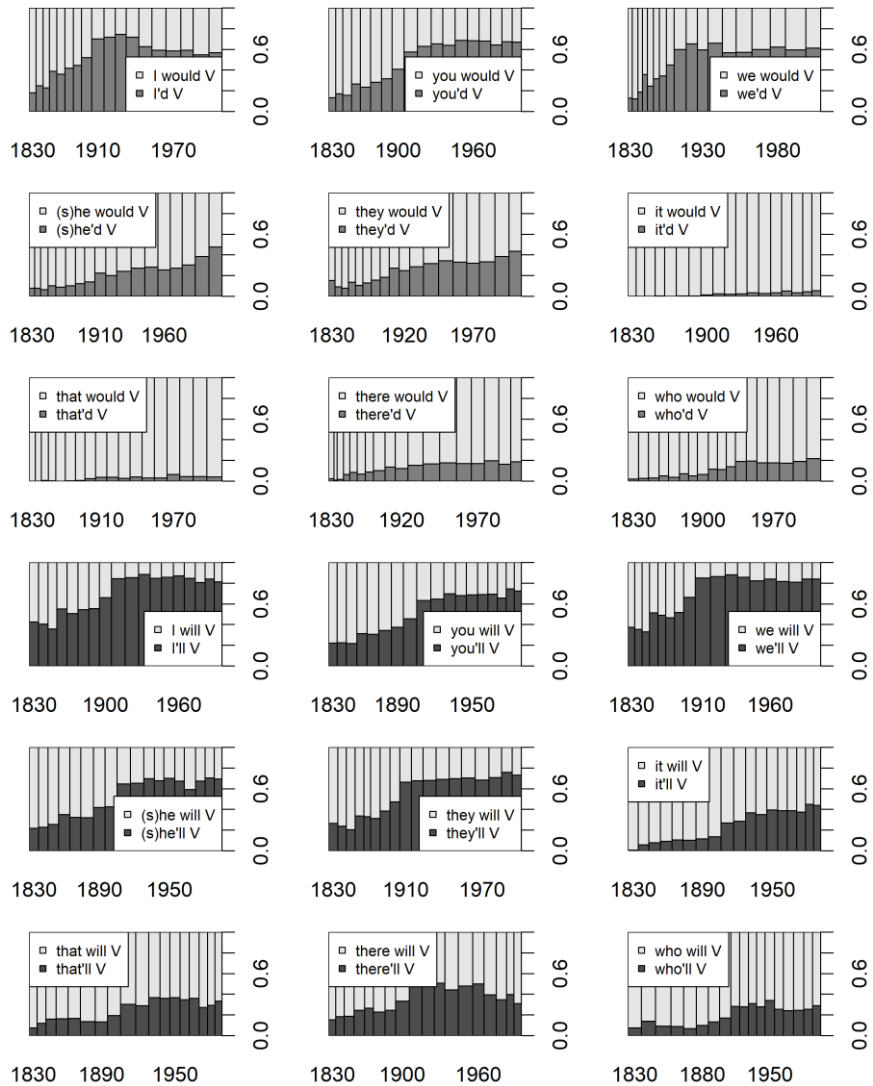
Figure 5.3. Changes in the use of selected hosts of enclitics relative to their full forms in COHA (FIC)

The plots summarize the respective developments for personal pronouns, *that*, existential *there*, and *who*, which combine to make up 99% of the data. Unsurprisingly, combinations with *I*, *you*, and *we* are clearly favored by both enclitics. In the case of animate third person pronouns (*he*, *she*, *they*), [[SUBJ *'ll*] V] has become more frequent than its full form, while [[SUBJ *'d*] V] is just below par. By contrast, neither enclitic is preferred over its full form in combination with inanimate (or impersonal) pronouns (*it*, *that*), existential *there*, and *who*. In keeping with the position that certain subject properties offer important (yet not decisive) clues for specific modal interpretations, the developments shown in Figure 5.3 provide some indication of potential functional preferences in the use of enclitics and full forms. For example, notions like 'volition' and 'intention' typically require animate, conscious agents. The disproportionate co-

occurrences of *I* and *we* with both enclitics could thus be a first signpost of the symbolic associations these patterns evoke relative to the full forms.

In sum, what the previous analysis has brought to the fore is that the overall increase in token frequency of both patterns [[SUBJ*'ll*] V] and [[SUBJ*'d*] V] cannot solely be attributed to one specific SUBJ + ENCLITIC combination but is, at least in part, due to a greater yet still restricted variability regarding the enclitics' subject hosts. To advance this idea further, the V slot will be considered next.

5.4.2.2 Shifts in productivity

Productivity may be understood as the range of lexical material readily used in a variable pattern (Barðal 2008; Bybee 2010; Goldberg 1995; Hilpert 2013a). In the present context, measuring productivity is in line with the analysis above, as it helps to uncover how the quantitative development in token frequency of enclitics relates to possible qualitative changes in the V slot.

The most straightforward way to assess productivity is by means of type frequencies, which are typically associated with the generalization of variable patterns and their entrenchment (e.g. Goldberg 2006: 98–100; Ziem & Lasch 2013: 102–109). Type frequency distributions can be measured directly, giving information about 'past achievements', also known as *realized productivity* (Baayen 2009: 901–902). However, to determine whether a pattern will likely continue to be productive, Baayen (1992) recommends using *potential productivity*, operationalized as the number of hapaxes of a given pattern (i.e. types occurring only once in a corpus) relative to that pattern's token frequency. The general idea behind focusing on hapaxes has psycholinguistic merits: the larger the number of low frequency types (and conversely, the lower the number of high frequency types) of a given pattern relative to its overall usage, the more likely that pattern will remain (semantically) transparent and parsable, which increases the chances of novel instantiations (Bybee 2013; Hay & Baayen 2002).

The present study utilizes a modified version of potential productivity, namely *extrapolated potential productivity* (P_{extr}), which compensates for a general drawback inherent to type frequencies and thus type-frequency-related measures. Herdan-Heaps' law dictates that type frequencies vary with sample size in a non-linear way, which means linear standardization procedures, like normalization per million words, cannot be applied to compare type (or hapax) counts for patterns that differ in token frequency. Previous

studies (e.g. Hartmann 2018; Kempf 2016; Schneider-Wiejowski 2011; Zeldes 2012), however, have shown that, by extrapolating the token frequencies of different patterns (or one pattern at different points in time) to a common number using LNRE models, the probability values for P can be made comparable. The procedure is quite data intensive and thus requires merging several decades into larger clusters. In the present case, a sensible trade-off between information loss and methodological feasibility was found to be an eight-cluster solution.

To obtain the type–probability distributions from which P_{extr} can be derived, frequency spectrum objects were generated for each pattern in each cluster and subsequently submitted to finite Zipf-Mandelbrot (fZM) modeling; for details, see Baroni & Evert's (2014) tutorial.[61] Since the token frequencies for the patterns are still comparatively low, variance in the model fits was expected to be an issue. To compensate, fZM-models were fitted to 1,000 parametric bootstrap samples per pattern per cluster (cf. Hartmann 2018).[62] Based on these models, the observed frequencies were extrapolated to the same number, N_{extr}=200,000 tokens, which is roughly five times the size of the largest token count for a pattern in a cluster. Following this, the extrapolated hapax growth curves were computed for each sample and the hapaxes were extracted and divided by the respective N_{extr}, which yielded 1,000 values of P_{extr} per pattern for each cluster. The results of the analysis are presented in Figure 5.4.

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[61] The analyses were conducted using Evert & Baroni's (2007) R package {zipfR}.

[62] Since non-parametric bootstrapping deflates type counts and thereby distorts type-token measures, parametric bootstrapping was used instead, where the samples were drawn from the population described by the fitted fZM-model (Baroni & Evert 2016).
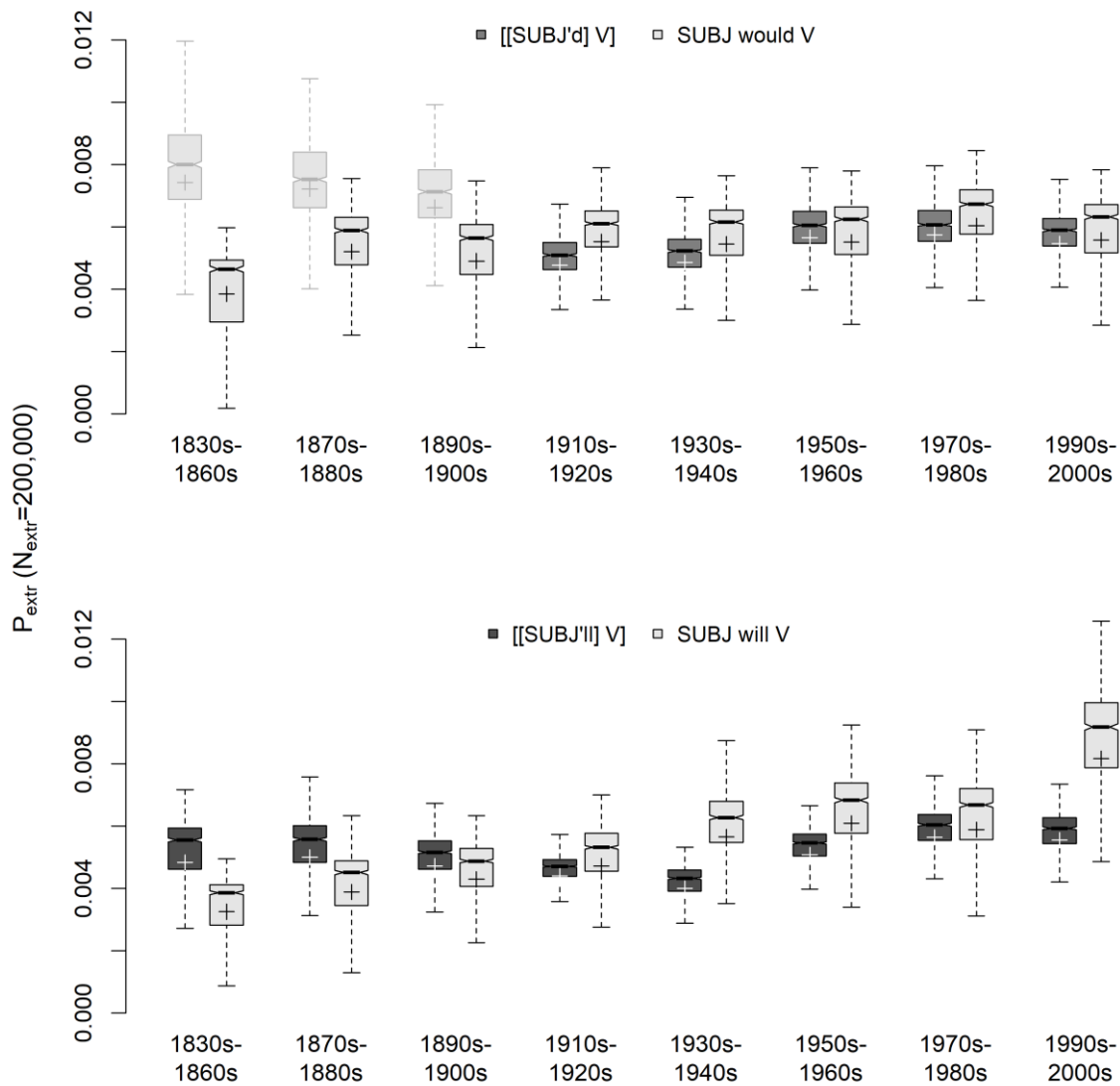
Figure 5.4. Changes in the extrapolated potential productivity (P_{extr}) of the verb slot in [[SUBJ*'d*] V] and [[SUBJ*'ll*] V] as well as their corresponding full forms in COHA (FIC); based on fZM-models fitted to 1,000 parametric bootstrap samples for each pattern per period; crosses indicate the mean; outliers are removed

The plots in Figure 5.4 paint quite a mixed picture. While both full forms record steady increases in their P_{extr}-values since the 1830s (SUBJ *would* V: r_τ=.86, p=.0017; SUBJ *will* V: r_τ=.93, p=.0004), there are no significant overall trends discernible in the enclitics' respective developments ([[SUBJ*'d*] V]: r_τ=−.43, p=ns; [[SUBJ*'ll*] V]: r_τ=.14, p=ns).[63]

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[63] This assessment is based on the median values for P_{extr}. Note that the token frequencies for [[SUBJ*'d*] V] from the first three clusters are considerably lower than for the other patterns (N_{obs}<10,000), which may render the model parameter estimations not fully reliable, hence the faded coloring in the plot. The procedure was repeated using larger clustering schemes (e.g. 1830s–1890s), which yielded somewhat similar, non-significant trends.

However, from the progressions, it appears that the relatively high degrees of potential productivity in the V slot of the enclitics over the course of the 19th century facilitated (at least initially) their quantitative developments in usage frequency. The dip in productivity in the beginning of the 20th century is concomitant with the enclitics' steep increase in usage frequency at that time and suggests that both patterns had reached a point of saturation where their development was mainly driven by established combinations rather than novel instantiations. An apparent 'revival' in productivity after the 1930s points to further qualitative changes in the patterns, through which [[SUBJ*'d*] V] became both more variable and more frequent. [[SUBJ*'ll*] V], on the hand, certainly also had the potential for expansion, but this did not translate into a more frequent overall use (cf. Figure 5.1).

Interestingly, throughout the 20th century, the full forms constantly outperform the enclitics in their potential for more variability in the V slot, which indicates that both [[SUBJ*'d*] V] and [[SUBJ*'ll*] V] remain more restrictive regarding the expectations the different SUBJ + ENCLITIC combinations evoke about the range of verbs that can follow. A similar relative restrictiveness was also established for their subject host variability, according to which the enclitics maintain stronger preferences for first- and second-person pronominal subjects. It may well be that these preferences have an impeding effect on the enclitics' productivity to some extent, as pronouns like *I*, *we*, and *you* are associated with interpersonal communication, a register that typically exhibits lower type-token ratios (Biber 1993; Biber & Conrad 2001). Since the full forms are generally more evenly dispersed in the SUBJ slot, their use will not be limited to specific communicative situations, and they will likely have more opportunities to expand, which seems to manifest here as higher P_{extr}-values.

Overall, the shifts observed here do not seem to point to a simple case of displacement, whereby enclitics gradually take over the full forms in informal writing. If enclitics were to be treated simply as the colloquial analogues of their full forms and the viable alternative in spoken-like discourse, more directed trends would be expected such that the enclitics' increasing degree of conventionalization would lead to relatively more ad-hoc formations and thus higher degrees of potential productivity; the reverse should hold for the full forms. Parallel developments in whatever direction could also be conceivable if the patterns were fully equivalent and interchangeable in any contexts. However, the progressions in Figure 5.4 support neither scenario. Nor does it seem to be the case that enclitics are conventionalized in a way that their use is only restricted to fixed, fossilized sequences, which otherwise should have resulted in robust downwards

trends in their degree of potential productivity. The erratic nature of the developments rather fuels the suspicion that enclitics and their full forms develop (at least in part) independently of each other.

Since productivity (as well as entropy) measures are blind to the actual elements that occur in a variable pattern, the overall picture will be completed by investigating the co-occurrence of specific subjects with specific verb infinitives in enclitic constructions relative to their full forms.

5.4.2.3   Idiomatic combinations

Thus far, the variable slots were only analyzed in isolation. It can, however, be expected that certain SUBJ + ENCLITIC + V combinations will show a higher degree of cohesion than others. Focusing on the interaction between the slot fillers in both patterns should therefore put us in the position to identify these combinations and help bring certain aspects about the constructional semantics of enclitics to the fore. In addition, it will be necessary to also account for the alternation between them and their full forms at the same time. Ultimately, this can be achieved by means of distinctive co-varying collexeme analysis (DCCA). The method combines distinctive collexeme analysis (Gries & Stefanowitsch 2004) with co-varying collexeme analysis (Stefanowitsch & Gries 2005) and, in the present case, outputs the SUBJ + V combinations that occur more often in enclitic patterns over their respective full forms than would be expected by chance. In essence, DCCA is a configural frequency analysis (CFA; von Eye 1990) in a collostructional context that tests all possible configurations of SUBJECT × VERB × ALTERNATION × TIME for 'types' (observed frequency significantly higher than expected frequency ≙ attraction) and 'antitypes' (observed frequency significantly lower than expected frequency ≙ repulsion) (cf. also Stefanowitsch 2020). This lets us to group the data according to specific configurations and compare how two patterns differ regarding their co-occurring elements; for example, *I'll* V vs *I will* V in the period 1950s–2000s.[64] The results for selected combinations are shown in Figure 5.5 and Figure 5.6.

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[64] The analyses were performed using Flach's (2021) R package {collostructions}. The degree of attraction or repulsion within each configuration is assessed using the *t*-score. Although mathematically inappropriate and uncommon in a collostructional context, Evert (2009) shows that it can outperform other measures when testing multi-word sequences, thus proving its usefulness as a heuristic measure.
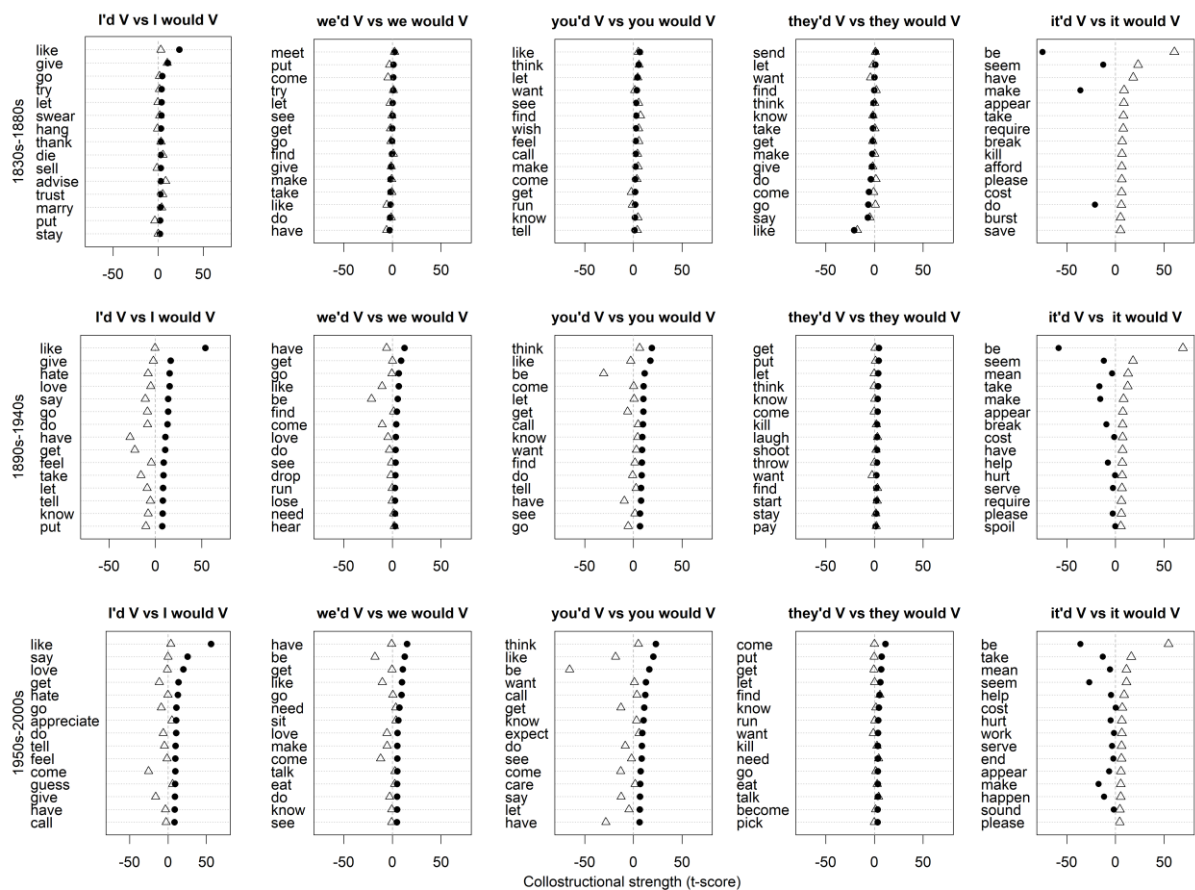
Figure 5.5. Top-15 distinctive co-varying verbal collexemes of selected [SUBJ*'d*]-combinations relative to their respective full form across three time periods in COHA; ● represents *'d*, △ represents *would*

The plots highlight the 15 most distinctive co-varying verbal collexemes of different [SUBJ*'d*]-combinations over three 60-year periods in COHA. The collexemes are grouped according to the enclitic, which allows us to compare its collexemic profiles for each period regarding its changing degree of demarcation.[65] From left to right, the plots suggest a cline from the most to the least conventionalized combination. Vertically, we can see how *'d* has changed in terms of its co-varying collexemes and how these fare against the alternative with *would*. Combinations with *I'd* appear to be the most advanced and most emancipated in this regard, considering that the majority of its distinctive collexemes are repelled for the alternative with *would* in the second and third cluster. *You'd* seems to take the second place before *we'd*, showing very clear relative preferences for specific combinations, for example, *you'd like* or *you'd be* (COMPL). In the case of *they'd*, its collexemes continue to match the alternative with *they would* fairly closely with only a slightly more noticeable demarcation in the final cluster. Finally, *it'd* is

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[65] An exception was made for *it*, considering that both *it would* and *it will* boast higher *t*-scores than the cliticized variants in almost every case.

constantly outperformed by *it would*. The fact that some verbs are not even available in combination with *it'd* points to its rather low degree conventionalization. Similar but more pronounced developments are recorded for [SUBJ*'ll*]-combinations; see Figure 5.6.
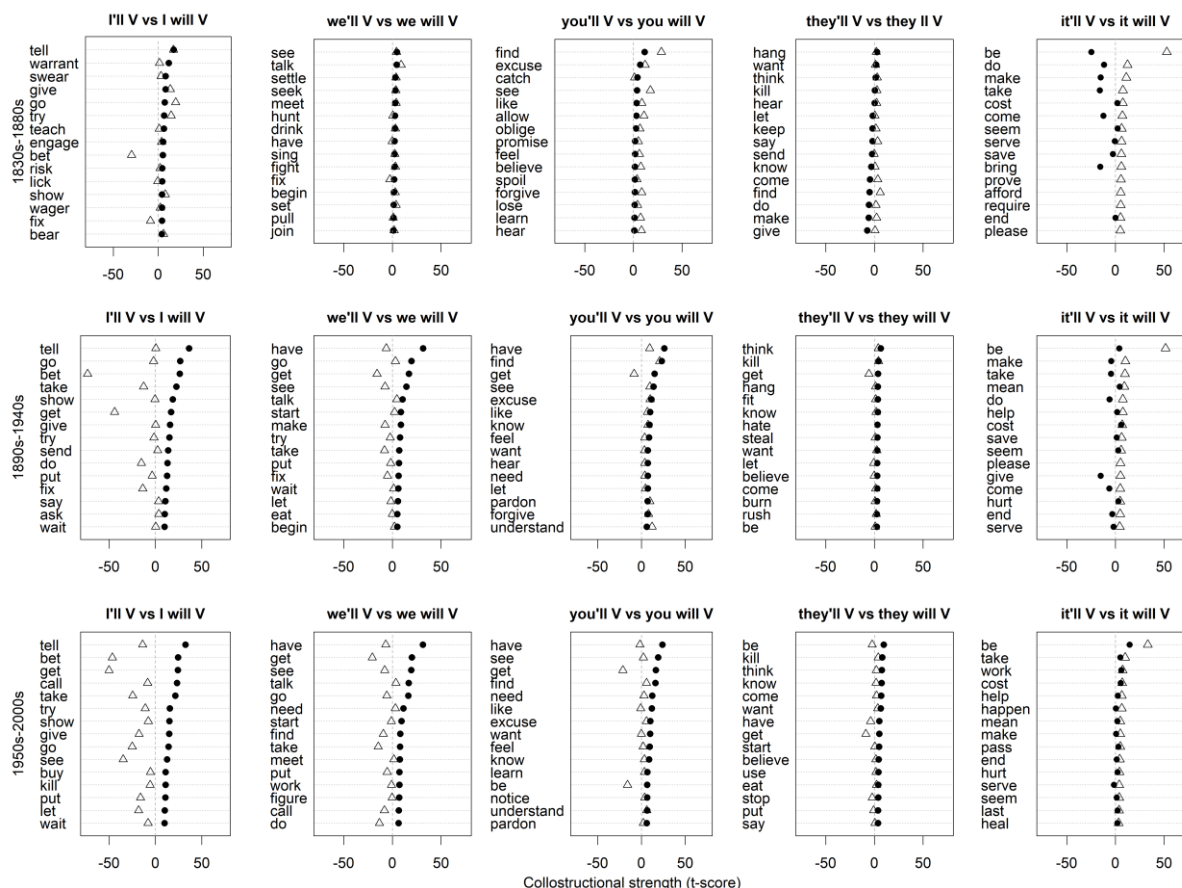
Figure 5.6. Top-15 distinctive co-varying verbal collexemes of selected [SUBJ*'ll*]-combinations relative to their respective full form across three time periods in COHA; ● represents *'ll*, △ represents *will*

Especially *I'll* and *we'll* have emancipated themselves from the full form alternatives in the final cluster, as is evident from the growing wedge between the points and triangles from the top panels to the bottom, with *you'll* gradually following in their footsteps. Again, combinations with *they* do not seem bring about any drastic differences between the enclitic and its full form, as was the case for *'d*; but unlike *'d*, *'ll* seems to have become a more viable alternative to *will* when combined with *it*, given that their collexemes match more consistently in the final cluster.

To interpret the data, contextual cues can be exploited. Specific syntactic co-occurrence patterns found with the modals have been shown to highly correlate with specific modal meanings; for example, inanimate subjects and stative verbs in

combination with either *will* or *would* strongly suggests an epistemic reading (Coates 1983: 181, 218–219). By contrast, co-occurrence with first-person pronoun subjects, for which enclitics have a clear preference, increases the chances of a non-epistemic (e.g. 'volition') reading. With this in mind, another look at the plots from Figure 5.5 and Figure 5.6 allows for a more elaborate assessment of how the patterns are conventionalized. The cline from left to right also suggests a continuum from dynamic (and possibly deontic) to epistemic modality, with *I'd* and *I'll* representing the dynamic and *it would* and *it will* the epistemic endpoint.

Among the top collexemes of *I'd*, we find highly conventional combinations like *I'd like*, *I'd love*, *I'd hate* or *I'd appreciate* which convey 'volition' or '(polite) request' rather than 'epistemic prediction'. The final cluster also lists *I'd say* among the top configurations, which, despite its discourse function, carries traces of 'intention' that foreground the speaker's opinion. The other end of the continuum lists combinations that can confidently be predicted to express epistemic meaning, namely *it + be|mean|seem|cost|appear|happen*, which are strongly dispreferred by *'d*. *We'd* and *you'd* are more difficult to assess. While sequences like *we'd like* or *we'd love* are very similar to their *I*-analogue, other trigrams may not be disambiguated that straightforwardly without further co(n)textual information, hence their intermediate position on the dynamic-epistemic-modality-cline. Given the overlap between *they'd* and *they would*, preferences in the sense distribution will pertain to both forms alike.

Consider *'ll* next. Again, the combinations with *I* stand out, but even more clearly than in the case of *'d*. Next to highly idiomatized sequences, like *I'll bet* ('conveying confidence, agreement') or the discourse marker *I'll tell (you)*, a strong relative preference for using the enclitic in contexts that convey 'intention' or 'willingness' is evident from sequences with dynamic action verbs (e.g. *call*, *take*, *try*, *give*, *go*, *buy*, *kill*, *put*). The uses with *we* are similar in this regard and possibly signal 'informal arrangements' or 'spontaneous decisions' (cf. Nesselhauf 2014: 85); for example, *we'll talk*, *we'll meet*, or *we'll go*. Also note the highly idiomatic sequence *we'll see*, which signals a speaker's intention to postpone a decision. Moving further down the cline, the uses with *you'll*, and *they'll* become more difficult to predict. By contrast, the stative verbs with which *it'll* and *it will* readily combine (e.g. *be*, *cost*, *happen*, *mean*, *last*, *seem*) clearly point to epistemic modality and the near overlap signals that the enclitic and the full form are likely to vary more freely in these contexts. However, *will* retains an advantage over *'ll* when combined with *it*, as is evident from the higher *t*-scores.

Considering that fictional texts should not impose any restrictions on the use of *it'll*, speakers seem to be genuinely hesitant to let the enclitic take over the onomasiological space (cf. also the uses with *'d*).

The results corroborate the importance of integrating information about the subject (host) into the analysis of collexemic preferences in the present case, as modal meanings could be identified with much higher degree of precision than could have been achieved with simple MOD + V bigrams. How these findings contribute to our understanding of the alternation between enclitics and full forms will be discussed in the final section of this study.

5.5 General discussion: variation, change, and possible generalizations

While previous studies have already suggested that the enclitics are not fully equivalent to their full forms, going as far as to argue that they represent distinct constructions (Daugs 2021; Nesselhauf 2014), the present study argued for a refinement of this assessment. This section thus brings together the results and measures them against the status of *'d* and *'ll* in the larger modal system. The discussion will be centered around the original proposal according to which enclitics represent variable patterns of associations that differ from their full forms beyond their degree of (in-)formality.

The first obvious observation concerned the increase in usage frequency of both enclitics in AmE, which provided a coarse approximation of their changing degree of conventionalization. Perhaps more important than their overall increase in absolute frequency is their relative development. This finding is in itself expected from the vast amount of literature on contractions, yet arguably less so is the magnitude of the development. While *'d* has gained serious ground on *would*, it remains clearly below par, as *would* does not show any signs of being used less frequently; by contrast, *'ll* has become much more frequent than *will* in fictional writing but, just as the full form, it has experienced a decline in the 20th century. This provides a first indication that we are dealing with constructional rather than systemic changes. Whether the developments pertain to form, function, or distribution, DCxG strongly emphasizes the selectiveness with which constructional changes operate (Hilpert 2013a, 2018, 2021). Although both *'d* and *'ll* were originally on similar paths in terms of their overall usage frequency, their diverging shifts over the past ~80 years suggests that they were not simply subject to a

common, more global trend. Furthermore, the changes in their relative frequencies point to differences in the variation between them and their full forms.

Also, because enclitics prototypically require both a subject host and a collocating verb infinitive, it was argued that any investigation into the variation between them and their full forms needs to factor in the variable elements with which these patterns can occur. This had implications for tracing their developments across time because neither their degree of conventionalization nor their entrenchment could have been approximated sufficiently enough if only simple text frequencies were used, as these conflate changes pertaining to the patterns as whole with changes in the variable slots (Stefanowitsch & Flach 2017). The analyses revealed higher degrees of subject host variability and temporary increases in the productivity of their verbal collexemes, which suggested qualitative changes in both enclitic patterns. While this clearly had facilitating effects on their overall usage frequency, both *'d* and *'ll* remained considerably less variable in the SUBJ slot and, at least over the course of the 20th century, less productive in the V slot than their respective full forms.

In combination, the increase in usage frequency and this relative restrictiveness in variability points to 'new' symbolic associations enclitics possibly evoke. To elaborate, it will be easier for speakers to recognize commonalities between the elements in a variable pattern and form symbolic associations with it if that pattern is not fully promiscuous but remains 'sufficiently manageable' regarding the number of elements that occur in it (Schmid 2020: 231–232). Moreover, if two patterns can potentially take the same elements but one takes specific elements more often than the other, these combinations will become relatively more conventionalized and entrenched. This is exactly what we find regarding enclitics and full forms and the collostructional analysis revealed what these combinations are. For both *'d* and *'ll*, it was established that they have collexemic preferences which differ from the full forms, yet not across the board but rather for specific combinations, especially combinations with first- and second-person pronouns and verbs with a high degree of dynamicity. By contrast, the full forms prefer the inanimate/impersonal pronoun *it* in combination with stative verbs. Based on the known correlations between specific syntactic co-occurrence patterns and specific modal meanings (Coates 1983), dynamic modality has been shown to be more strongly associated here with enclitics, while epistemic modality is rather associated with the full forms. Crucially, these symbolic associations are not evoked by *'d* and *'ll* or *would* and *will* respectively but by specific combinations of an enclitic or full form with its variable

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elements. To illustrate, Nesselhauf (2014) has argued that *'ll* has acquired a new meaning, namely 'spontaneous decision'. Interestingly, the examples she provides are limited to combinations of *'ll* with *I* and *we*. This is plausible because 'spontaneous decision' is based on 'intention', which correlates highly with first-person subjects, as was mirrored by the restricted subject host variability and the collostructional analysis presented here. Similarly, *would* has been shown to express epistemic modality over *'d* more often than would be expected by chance (Daugs 2021). Again, from the data presented here, we can show explicitly that it is the combinations with *it* + *would* + v that convey epistemic modality more often than the alternative with *'d*. By contrast, the enclitic expresses 'volition' over its full form beyond chance level, but only in combination with *I* or *we*. In other words, the difference between an enclitic and its full form is not a matter of whether the exact same combination conveys a different meaning. Apart from a few highly idiomatic sequences, there is no reason to assume that, for example, *we'll talk later* and *we will talk later* are semantically drastically different or achieve different communicative goals. Rather the associations the respective sequences evoke differ; more precisely, the syntagmatic associations in the sequence *we* + *'ll* + *talk* (+ *later*) are relatively stronger and the paradigmatic alternatives for *we* and *talk* to co-occur with *'ll* are more limited, which promotes the emergence of symbolic associations (cf. Schmid 2020). Essentially, this materializes as distributional differences in language data (cf. Hilpert 2016a, 2021; Hilpert & Flach 2020).

Based on this assessment, it can be concluded that the refinement on the status of enclitics promised in the introduction pertains to their constructionhood, more specifically the level of abstraction we may assume. Instead of postulating that the meaning differences between enclitics and full forms discussed in this study and elsewhere manifest at the level of a more general *'d*-construction or an *'ll*-construction, the data presented here support the view that these differences can be captured right at the level where they are uncovered. Accordingly, there could be a generalization formed over *I'll* v and *we'll* v that triggers the association 'spontaneous decision', or *I'd* v conveying 'volition', whereas *it will* v or *it would* v are relatively more strongly associated with 'epistemic prediction'. These lower-level generalizations seem perfectly capable of addressing the distinction between enclitics and full forms reported in earlier studies and, what is more, they can do so without recourse to a higher, more abstract level. Note that this does not automatically preclude the existence of more general enclitic schemas,

which may exist after all. But apparently, there may not be an immediate need to assume them in the present case.

This position is very much in line with current research in (Diachronic) Construction Grammar, where constructions are only postulated if there is empirical evidence to do so (e.g. Barðdal 2008; Hilpert 2013a) and where much of speakers' linguistic knowledge (specifically on alternations) can be captured by horizontal links between constructions at the same level of specificity rather than by vertical, inheritance links (e.g. Sommerer & Smirnova 2020 and contributions therein). It also conforms with the minimal abstractionist view advertised in dynamic, network-oriented models, most notably the EC-Model, which is generally hesitant to rashly postulate (highly) schematic generalizations at the cost of a more fluid patterns of associations (Schmid 2020). Admittedly, the resulting level of granularity achieved here comes with the methodological challenge of having to disentangle several enclitic patterns (or constructions), but the findings further support the view that English modal expressions constitute a highly complex system in flux.

6 Revisiting global and intra-categorial frequency shifts in the English modals: A usage-based, constructionist view on the heterogeneity of modal development

The article in this chapter is the author accepted manuscript of the study that has been published as:

Please quote from the original publication.

Abstract

English modal verbs are claimed to be declining in their use in English (Leech 2011, 2013; inter alia), an assertion that is essentially based on aggregate frequencies of modals across register and time (Biber 2004). Since modals may be viewed as a prime example of paradigmatic organization (e.g. Diewald 2009; Diewald & Smirnova 2012), it seems only plausible to seek a generalization regarding their overall development. This approach, however, comes with a drawback, namely that it neglects the modal system's underlying heterogeneity. By utilizing both historical and contemporary language data from COHA (Davies 2010) and COCA (Davies 2008), I will argue that the obvious variability in the English modal system represents an important caveat against making generalizations across an entire category in terms of frequency shifts.

6.1 Introduction

Despite the substantial research literature on issues related to modality already in circulation, English modal expressions continue to attract a great deal of interest within the linguistic community. With the advances in (diachronic) corpus linguistics since the 2000s, it is specifically the variation and change of modal verbs (e.g. *can*, *must*) that has become one of the main focal points, leading to numerous studies that, among other things, have investigated their overall development (e.g. Leech 2003; Leech et al. 2009), long-term individual trends (e.g. Daugs 2017), register- or text-type-specific changes (e.g. Biber 2004; Millar 2009), shifts in collocational preferences (e.g. Hilpert 2012, 2016a) and the emergence of new modals (e.g. Krug 2000; Lorenz 2013a). The general conclusion that can be drawn from these studies is that the English modal system has been in a long-lasting process of restructuring; moreover, according to prevailing opinion, modal verbs regarded as a group have been decreasing in their frequency of use for the better part of the last century. The evidence to support this claim is robust and the present paper will not argue against it. It will, however, advise caution that a generalization as large as the overall demise of modal verbs, which is essentially based on aggregate frequency counts, underestimates noteworthy individual trends in the data that render modal development much less homogenous than the proclaimed global demise actually suggests. To this end, this study provides a reassessment of the diachrony of modals in AmE that minds their individual trends rather than lumping them together under one umbrella category. By subscribing to the usage-based, constructionist framework laid out by Goldberg (2006) (CxG) and to Hilpert's (2013a) notion of constructional change, I will argue furthermore that modal expressions, such as *will*, *'ll* and *won't*, *would* and *'d* or *can* and *can't*, which are traditionally subsumed under WILL, WOULD and CAN respectively, may actually be treated as (parts of) distinct constructions (cxns) that show quite divergent frequency shifts; see Lorenz (2013b) for a similar take on the status of *gonna*, Nesselhauf (2014) on the status of *'ll* and Daugs (2021) on *won't*, *can't* and *'d*. Admittedly, this approach leads to a rather high level of granularity and seems to run counter to the aim of seeking the largest generalization possible. Yet, by keeping a close eye on individual expressions and their development, it may eventually be possible to identify new categories within the larger modal system that behave more homogenously than the entire class of modals as a whole.

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The remainder of this paper is structured as follows. Section 6.2 provides a brief overview of the studies on modal development in English and their implications for this paper. In Section 6.3, the issue on what actually constitutes a modal cxn will be addressed by drawing on recent research by, for example, Hilpert (2016a) and Cappelle & Depraetere (2016a). In Section 6.4, the results of this study are presented and linked to the rather heated debate between Millar (2009) and Leech (2011) on what is actually happening with and within the modal system. Before concluding this paper, Section 6.5 will discuss some implications a usage-based CxG approach might have on categorizing modal expressions using the negative modal contractions as an illustrative example.

6.2   The diachrony of modals: Where we are at so far

The corpus-based research output on the diachrony of modal expressions is quite considerable and rehearsing it all here would neither be feasible nor revealing for the purposes of this paper. Instead, the present investigation will mostly be limited to contributions that discuss the overall development of the modal category as a whole. In this regard, one of the arguably most prominent claims is that the class of modals has been declining in its frequency over the course of the 20th century (at least in BrE and AmE). This has largely been promoted in Leech (2003, 2004b), Biber (2004), Leech & Smith (2009) and Leech et al. (2009) and has been confirmed in, for example, Leech (2011, 2013), Seggewiß (2012) and, with some reservations, Daugs (2017). By contrast, Millar (2009) and Mair (2015) come to different conclusions; while Millar (2009: 199) observes a general increase in the use of modals over the course of the 20th century, Mair (2015: 131–132) argues that, at least in AmE, there have been significant fluctuations in the development of the modals during that period which essentially even one another out so that no directed trend can be detected. Figure 6.1 visualizes the frequency shifts identified in some of the studies mentioned above.[66]

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[66] All data visualizations in this study were build using R (R Core Team 2018).
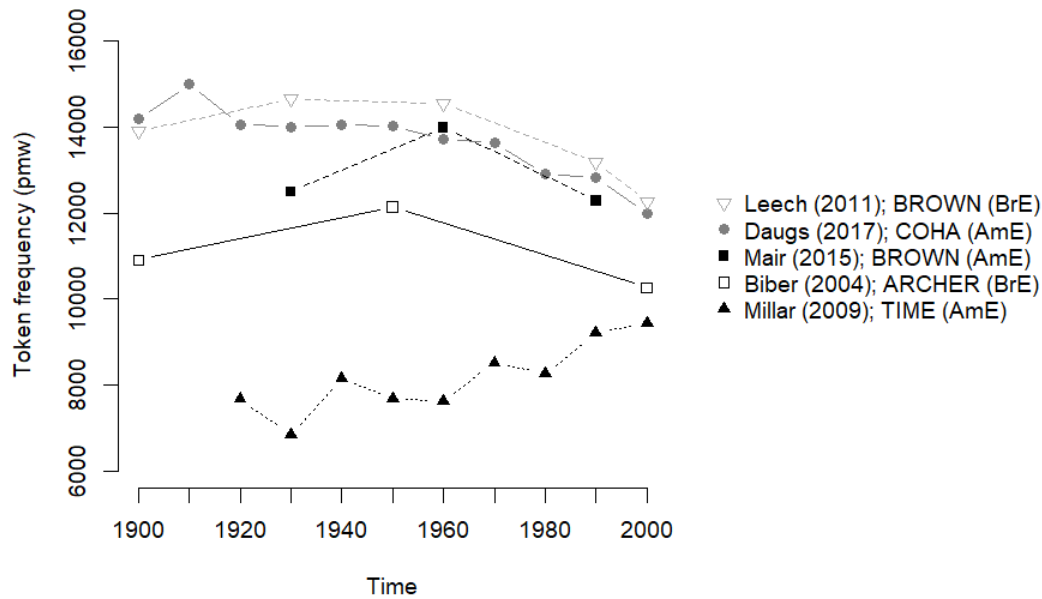
Figure 6.1. Frequency shifts in the overall use of modal verbs in BrE and AmE over the course of the 20th century[67]

Four out of five curve progressions behave quite similarly roughly after the mid-20th-century, indicating a clear downwards trend and thus supporting the proclaimed overall demise of modals in AmE and BrE; only Millar's data break rank, showing a general increase in the use of modals (Millar 2009: 199). The first half of the 20th century, however, clearly presents a less uniform picture with no common development discernible across all studies. Possible reasons for this divergence have been discussed at length in the respective studies; for example, corpus sampling and comparability (Leech 2011: 558–560; Mair 2015: 133) or corpus size and chronological gaps (or number of data points) (Millar 2009: 192–194). While it can be expected that all of these factors will play some role in this diachronic turmoil, the more pressing issue the present paper focuses on is how and why frequency shifts of the entire category of modal verbs are investigated. The *how* can be answered straightforwardly, as the slopes in Figure 6.1 are simply the result of adding up the frequency counts of individual modals that are deemed to belong together. The studies mentioned above are largely congruent in terms of their selection of what counts as a 'core' modal, namely *will*, *would*, *can*, *could*, *may*, *might*, *shall*, *should* and *must*, and it is common practice to provide information on their

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[67] Given that ARCHER is divided into 50-year periods, Biber's (2004) data, as there are represented here, may only be regarded as an approximation.

individual developments alongside the global trend.[68] To illustrate, Figure 6.2 below shows the individual trends of modals in 20th century AmE, as reported in Daugs (2017).
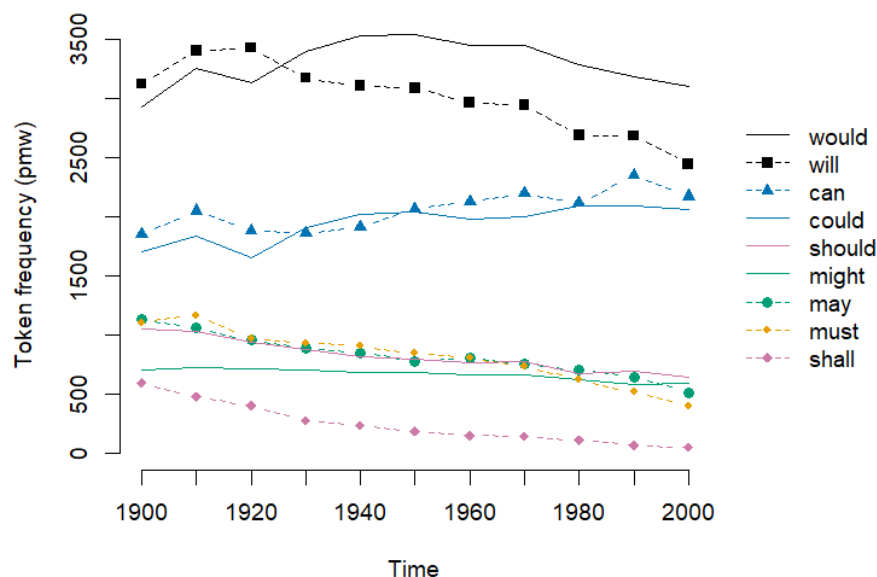
Figure 6.2. Frequency shifts of individual modals from 1900 to 2009 in COHA

From Figure 6.2, it becomes immediately clear that the modals behave anything but homogenously over the course of the 20th century, neither maintaining their rankings in every case nor changing unidirectionally. Leech (2003, 2011, 2013) and Leech et al. (2009) have made attempts to identify smaller, more uniform groupings within the larger modal category based on frequencies, claiming that the high-frequency modals (*will*, *would*, *can*, *could*) remain stable as a group, while the low-frequency modals (e.g. *must*, *shall*) are essentially the ones that push the overall demise by becoming even more marginalized. Although this might seem to bring some order to the category, the data presented in Figure 6.2 do not support this approach, considering that the high-frequency modal *will* has the second largest contribution to the overall decline (right after *must*) and that, from a longer-term diachronic perspective, neither *can* nor *could* pattern congruently with *will* and *would*; see Daugs (2017) for a detailed discussion. Thus, the dichotomy proposed by Leech and his collaborators unfortunately does not resolve the heterogeneity issue, but simply recreates it on a lower level.

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[68] In some cases, also *need* + V$_{bare inf}$ and *ought (to)* are included in the modal category as peripheral members (see e.g. Leech 2011 and Mair 2015).

This leads to the *why* concerning an investigation into the overall development of the entire category in the first place. A typical starting point in analyzing a linguistic category is to identify the attributes shared by members of that category. For modal verbs, it is firmly established that they share a number morphosyntactic constraints that set them apart from the other verbal categories, namely lexical verbs (e.g. *walk*, *read*, *become*) and primary auxiliaries (BE, HAVE and, in some aspects, DO). Among these properties are their defective morphology (i.e. lack of non-finite forms and person-number agreement, e.g. *to may*, *BE *mighting*, *HAVE *musted*, *she woulds*) and their complementation pattern with a bare infinitive (cf. e.g. *I will go* and *I hope go*) (Quirk et al. 1985: 127–128, 137; Huddleston & Pullum 2002: 75, 106–108). Based on purely formal grounds, it is therefore perfectly plausible to regard them as a clearly demarcated, homogenous linguistic category, which explains the interest in this category's development as a whole to some extent.

Semantically, however, such uniformity is difficult (if not impossible) to assess. Of course, we could simply postulate that all members of the modal category express 'non-factuality' or 'modality', but not much would be gained from such an approach, given that these terms (or rather the concepts behind them) are arguably too abstract to be revealing. Once any of the more fine-grained functional divisions is employed (see e.g. van der Auwera & Plungian 1998; Depraetere & Reed 2011), the variability within the modal category becomes obvious for three reasons: (i) modals can usually be used to express more than one meaning (depending on co[n]text), (ii) the different meanings are not distributed equally within each modal verb, and (iii) the meaning distribution continues to change, i.e. specific meanings are becoming more conventionalized than others (see e.g. Leech et al. 2003: 232–234; Millar 2009: 202–204; Hilpert 2016a). To illustrate, consider the examples in (28):

(28) a.   He dialed Bug's number. "Excuse me, Mrs. Pass, **may** I speak with Bug, please?" [COHA, FantasySciFi, 2003]

'permission' (deontic)

    a'.   But Armstrong cautioned that even if she makes sacrifices, saves steadily, and earns a good return on her money, Ginsberg **may** run out of cash before she reaches age 81, the current life-expectancy for American women. [COHA, WashPost, 2005]

'possibility' (epistemic)

b.   We will be leaving in June. The weather **should** be fine then. [COHA, Play:Pianissimo, 2000]

‘weak inference’ (epistemic)

b'.   Anderson suggests schools **should** grant students a certain amount of time online each month, quickly granting more if the student needs it. [COHA, CSMonitor, 2000]

‘weak obligation’ (deontic)

While different uses for both *may* and *should* are possible in current language use, there are diverging trends observable towards the meanings encoded in (a') and (b'), namely epistemic possibility on the one hand and weak deontic obligation on the other (Leech et al. 2009: 83–89). Such diversity casts some doubts both conceptual and methodological on whether it is feasible to report on general developmental trends of the modal category as a whole, considering the information loss such an approach brings about. As the following sections will show, this becomes even more noteworthy when the modals are investigated from a constructionist perspective.

6.3 Modals and CxG: What are modal constructions?

Since CxG sets out to be a linguistic theory that aims to explain language in its entirety (i.e. on all levels of linguistic description), it comes as no surprise that its proponents have started to venture forward into the already widely discussed linguistic domain of modality. Any such investigation presupposes an understanding of what constitutes a modal cxn; but this is less straightforward than perhaps expected.

CxG assumes that knowledge of language can be captured exhaustively by means of cxns (Goldberg 2003: 219; Croft & Cruse 2004: 255) and that cxns exist on all levels of specificity, from words to complex, abstract schemas (Goldberg 2013: 17). The cxn itself represents a unified whole that pairs a conventional form (with phonological, morphological and syntactic properties) with a conventional meaning (with semantic, pragmatic and discourse-functional properties) (Croft 2001: 18). With this in mind, it seems that little can be gained from adopting a constructionist perspective when it comes to modal verbs, as they simply constitute cxns themselves; basically, one could use the same data with merely a different label. To apply this to an example, consider the most general *must* cxn in Figure 6.3 below.
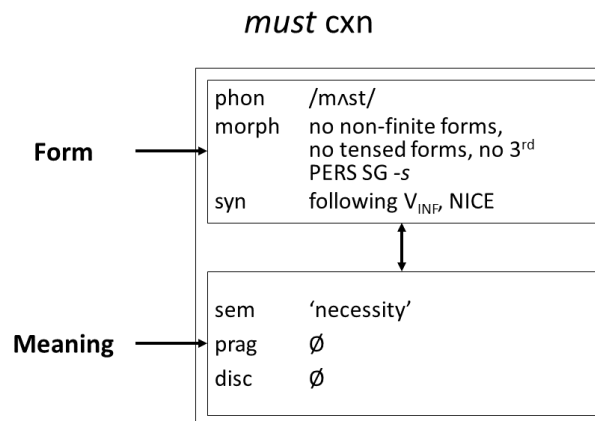
must cxn

Figure 6.3. The symbolic structure of the *must* cxn

Albeit not being necessarily formalized in such a way, this particular view of the *must* cxn (which can be applied analogously to the other core modals as well) is arguably very much in line with the one widely held in corpus-based studies on modal development, as it captures well-known information about the verb itself. The cxn links the formal properties discussed in Section 6.2 above with the semantic value 'necessity' which comprises both 'deontic obligation' and 'epistemic necessity'; yet, at this level, neither of them can be specified, nor can the pragmatic and discourse-functional properties.[69] Methodologically, retrieving the concrete instances of that cxn would simply involve searching for the modal verb *must* without specifying any syntactic configurations, which is how most of the studies mentioned so far (Hilpert [2016a] is a notable exception) have proceeded. Viewed in this light, it is difficult to see any value added by submitting the modals to a CxG treatment. Concerns regarding the general adequacy and explanatory value of a constructionist approach to modality have been raised by Wärnsby (2002, 2016); see Trousdale (2016) for a critical and convincing response.

Fortunately, constructionist approaches (at least cognitive, usage-based strands) have more to offer in this regard in that "they have shifted the attention away from abstract patterns and meanings to relatively specific and concrete 'low-level' constructions" (Boogaart 2009: 231). The logic behind this approach is that *must*, as any

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[69] Huddleston's (1980) NICE properties (i.e. operator function in NEGATION, INVERSION, CODE and EMPHATIC AFFIRMATION) were not discussed in Section 6.2, as these do not help distinguish between modals and primary verbs. They are, however, likely to be stored in some form in a modal (or any other auxiliary) cxn.

other modal verb (and many other words for that matter), is rarely encountered in isolation in actual language use; rather we find it as part of larger chunks that may themselves be instances of cxns. Such chunks typically provide the necessary cues to identify whether deontic or epistemic meaning is conveyed.[70] Consider the following examples in (29).

(29) a. He's always been in motion, driving around, peddling his watches, golfing and gambling, skiing, screwing. He **must have** a heart like a city pump. [COHA, Grandpa, 1999]

   b. The task is that, in three days time, you **must bring** me three things in the world that I do not have. [COHA, Play:Firebird, 1990]

The example in (29a) expresses 'epistemic necessity', which is common for the sequence *must* $V_{stative}$ (e.g. Bybee et al. 1994: 200), whereas the combination of *must* $V_{dynamic}$, as in (29b), typically has a 'deontic obligation' reading, particularly when coupled with an animate subject (e.g. Coates 1983: 21, 33–38).

It is here where, for example, Cappelle & Depraetere (2016a, 2016b) and Hilpert (2016a) propose that modal cxns may constitute partly schematic templates, consisting of both the modal itself as the pivotal element and an open slot filled by a bare infinitive (e.g. [*must* V], [*will* V]). Although these templates would fail several of the tests that can be employed to detect the constructionhood of an expression (e.g. non-compositional meaning, idiosyncratic constraints, deviation from canonical patterns)[71], Hilpert (2016a: 69) argues that speakers' knowledge of a cxn also includes probabilistic knowledge about which verbal slot fillers occur more or less often with a specific modal than would be expected; moreover, each modal cxn has its very own collocational profile which is "not predictable from any other knowledge of language that speakers of English can be assumed to have" (Hilpert 2016a: 70). Based on this assessment, it has been shown that the collocational preferences of modal cxns are subject to change which in turn suggests changes in the cxns' meanings; see also Hilpert (2008, 2012).

In line with this view, the present study revisits the development of the core modal cxns but also expands this group by a number of contractions, namely [[SUBJ *'ll*] V],

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[70] Note that not all combinations of *must* + V strictly fall in either of the two categories. Formulaic expressions, such as, for example, *I must admit* or *I must say*, seem to function primarily as a discourse marker rather than conveying an actual obligation.
[71] See Hilpert (2014) for an overview.

[[SUBJ*'d*] V], [*won't* V] and [*can't* V]. While these are traditionally treated as pronunciation variants and therefore typically accounted for methodologically by adding their frequency counts to the respective full forms, there is evidence suggesting that they rather represent distinct cxns with specific collocational preferences. Consider, for example, the case of [*won't* V]. To establish that we are in fact dealing with a cxn here, there must be evidence supporting that *won't* cannot simply be predicted on the basis of *will* or *will not* or any other existing pattern – that is, if we follow Goldberg's (2006) definition of what constitutes a cxn.

In terms of their form, it is obvious that *will not* and *won't* differ notably both in the phonological properties of their respective base as well as their syllable structure, as indicated in (30).

(30) *will not* | /wɪl‿nɑːt/ ↔ /woʊnt/ | *won't*
       | CVC‿CVC ↔ CVCC |

Instead of arguing that *won't* can be derived from *will not* by applying an idiosyncratic morphophonological rule, namely one that coalesces *will* and *not* and induces a unique type of base allomorphy, it appears to be far more plausible to simply assume a separate entry for *won't* in the minds of speakers, due to its unpredictable behavior. Even if speakers have abstracted a schema in the form of [X-*n't*], which is perfectly imaginable, given the decent number of possible instances (e.g. *couldn't*, *mustn't*, *needn't*, *daren't*, *doesn't*), *will* would still have to undergo the change from /wɪl/ to /woʊ/ to instantiate it, i.e. if we assume an active unification of *will* and [X-*n't*]. Yet, it is difficult to see any motivation for such a process. Rather *won't* is stored as a conventionalized unit that exists alongside *will* and a potential [X-*n't*] cxn. Continuing these lines of thought, it can then also be expected that *won't* has a distinct collocational profile of its own. As any other modal, it is typically combined with a bare infinitive and may thus also constitute a partly schematic cxn in the form of [*won't* V]. Clearly, such bigrams do not describe a modal's collocational behavior exhaustively. In fact, Cappelle & Depraetere (2016b: 86) argue that investigating "a modal's collocational preferences need not — and […] should not — be restricted to the following lexical infinitive". Using *must* as an illustrative example, they show how focusing on the larger co-text of a modal can help uncover modal cxns beyond simple bigrams, for example, the fully specified idiom [*The show must go on*] or the partially filled discourse marker [SUBJ *must* V*confess/say/admit*]. The present paper agrees

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with this view and it should go without saying that modals are typically integrated into larger sequences of which some may constitute cxns themselves. For *won't*, consider the examples [*That dog won't hunt*][72] or [SUBJ *won't do*intrans][73]. In either case, both the following infinitive and the subject need to be taken into consideration in order to identify the respective meanings of these cxns. An analysis of other distributional properties, such as subject preferences (or perhaps also adverbial collocates), can therefore certainly be rewarding. However, the focus here will rest on modal + V combinations only, as previous studies (e.g. Gries & Stefanowitsch 2004; Hilpert 2008; Dekalo & Hampe 2018) have already shown the fruitfulness of this approach in providing meaningful results.

To test whether there are any differences between the contraction and its full form in terms of their collocational preferences in present-day AmE, a specific form of collostructional analysis, namely distinctive collexeme analysis (DCA), as proposed by Gries & Stefanowitsch (2004), can be carried-out. This method is particularly suited for investigating the collexemes of functional variants; more specifically, it measures the association strength between a slot filler and a cxn over a functionally similar cxn.[74] Applied to the present case, DCA identifies which verbal slot fillers best distinguish between the [*won't* V] cxn and the full form; see the results in Table 6.1 obtained from COCA (1990–2017) prior to its most recent update.

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[72] <[*That dog won't hunt*]F ↔ ['sth. is expected to not fulfil its intended purpose'/'sth. is completely unrealistic or not feasible']M>, as in (31):

(31)   If your point was to sway voters from voting for Mitt Romney because he is inconsistent, **that dog won't hunt**. [COCA, nvdaily.com, 2012]

[73] <[SUBJ *won't do*intrans]F ↔ ['SUBJ is not enough/acceptable/satisfactory']M>, as in (32):

(32)   I could just replay it in my head, but **that just won't do**. [COCA, theblogess.com, 2012]

[74] The DCA was performed using Flach's (2017a) R package {collostructions}.

Table 6.1. The 25 most distinctive collexemes of *will not* ∨ and [*won't* ∨] in COCA[75]

#	*will not* ∨ collex	obs	exp	FYE	[*won't* ∨] collex	obs	exp	FYE
1	be	11,146	9,567.9	111.03	get	2,803	2,261.5	103.58
2	tolerate	302	135.4	61.34	let	2,413	1,986.4	72.12
3	allow	525	319.3	41.01	say	1,379	1,098.1	57.86
4	seek	131	52.0	36.63	do	2,383	2,019.7	50.75
5	accept	343	200.2	31.50	know	1,071	842.8	50.36
6	share	151	69.6	28.93	tell	980	765.4	49.42
7	stand	268	153.7	26.39	have	4,422	3,945.0	44.60
8	rest	103	43.0	25.63	need	774	601.0	41.23
9	occur	98	41.1	24.19	mind	299	209.8	36.94
10	suffice	74	28.2	23.05	hurt	600	461.1	35.14
11	receive	104	45.6	22.98	find	1,101	903.9	34.11
12	succeed	104	46.5	21.80	talk	567	449.6	25.22
13	support	168	90.5	20.66	believe	681	554.2	23.44
14	permit	111	52.3	20.31	work	1,344	1,160.6	22.64
15	attempt	61	23.1	19.46	like	369	287.3	19.64
16	provide	125	63.9	18.23	see	1,106	954.2	19.02
17	serve	82	36.3	17.87	matter	321	247.2	18.85
18	result	67	27.6	17.48	want	607	499.8	18.58
19	become	149	87.9	13.67	miss	257	196.3	16.33
20	lead	85	42.7	13.28	bother	213	159.6	15.90
21	survive	153	92.7	12.73	happen	1,066	938.5	13.76
22	surrender	47	19.3	12.62	take	1,353	1,212.9	12.86
23	participate	55	24.1	12.54	feel	353	286.6	12.84
24	affect	176	112.0	12.04	notice	177	133.8	12.45
25	apply	51	22.8	11.11	budge	152	115.5	10.38

The first obvious observation is that the contraction distinctively attracts verbs that are on average notably shorter (roughly 0.7 syllables) than the verbs that occur with the full form. Furthermore, the data show that there is a relative preference for mental activity verbs (e.g. *know, need, like*) to co-occur with *won't* rather than *will not* in contemporary AmE, and, conversely, a strong relative attraction between verbs related to '(un-)willingness' (e.g. *tolerate*, *accept*, *permit*) and *will not* over *won't*. This provides a first approximation towards (possible) functional differences between *won't* and *will not* and underscores the status of [*won't* ∨] as a cxn in its own right. Such differences are addressed in Daugs (2021); based on data retrieved from the fiction section in COHA, he finds that, when combined with their most distinctive verbal collexemes, *will not* appears to have developed a relative preference over *won't* for expressing 'volition', whereas the contraction rather conveys epistemic meaning.[76]

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[75] The collostructional strength is calculated by using negative log10-tranformed *p*-values of a Fisher-Yates exact test (FYE) as an association measure. Also note that all verbs in Table 6.1 occur with either expression in COCA.

[76] It should be noted, however, that DCA cannot reveal anything definitive about the actual collexemic profile of a cxn because it only highlights differences between functionally similar expressions and provides no information on their similarities. At that, it can model only a part of the distributional knowledge speakers are assumed to have of these cxns.

In the same vein, the arguments provided here (i.e. unpredictable formal properties, distinctive collocational/functional behavior etc.) also apply analogously to [[SUBJ*'ll*] V], [[SUBJ*'d*] V] and [*can't* V], although it must be mentioned that the enclitics *'ll* and *'d* are different from the negative contractions in that they require both a subject-host and the bare infinitive to constitute a cxn; see Booij (2010: 15) for a similar take on bound morphemes. The present paper will not discuss their constructionhood further but will simply assume that status.[77] Viewing contractions as cxns entails that the choice between them and their respective full forms is lexically motivated rather than morphophonologically. The methodological consequences that follow from such a claim will be part of the discussion in the next section.

6.4   A response to Leech's (2011) response to Millar (2009)

Before revisiting the developments of and within the English modal system based on the premises laid out in the last section, I will briefly rehearse the main arguments from Millar's (2009) study and Leech's (2011) critical response to it, given the contradicting results of these studies.

On the basis of the TIME corpus (Davies 2007–), Millar (2009) finds a general increase in the use of modals between 1923 and 2006. He notes, however, that this overall trend is mainly driven by *can*, *could* and *may*, while other modals, for example, *must* and *shall*, decline significantly (Millar 2009: 199–202). By contrast, Leech (2011) identifies an overall decrease in modal usage in both AmE and BrE over the course of the 20th century (based on COHA and the extended BrE component of BROWN), thus lending support to his previous (2003) claims regarding the demise of modals as a whole and the possible longevity of this trend. Leech's main point of criticism of Millar's results is the narrow view Millar adopts, i.e. he focuses purely on one publication (namely TIME magazine) that may not be representative of actual language as a whole (Leech 2011: 548–550). This criticism is valid insofar as modals are not dispersed evenly across different registers, which has been shown in, for example, Biber (2004) or Leech et al. (2009). Millar's (2009) results actually substantiate this claim. If modals do not occur to the same extent in all registers, they will hardly do so across all publications. The

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[77] For a full discussion on the constructional status of *'ll* see Nesselhauf (2014), on *'d* see Daugs (2021), and on *can't* see Bybee (2010: ch. 9) as well as Daugs (2021).

advantages of Millar's study over Leech's original (2003) investigation, namely corpus size, number of data points and chronological completeness, essentially became ineffective with Leech's (2011) response.

However, the present study would like to express some reservations against the final conclusion drawn in Leech (2011: 561) that "the frequency decline (in standard AmE and BrE) of the modal auxiliaries as a class is now past reasonable doubt". It is not the result as such that is puzzling, although counterevidence for this trend has been presented not only by Millar (2009) but also by Mair (2015); cf. Figure 6.1 above. It is rather the need to report on the development of the entire category in the first place that should raise some concerns, when, in the same breath, it is acknowledged that there are also modals that do not follow either proclaimed overall trend. The point is that the modal category typically receives special treatment in that its morphosyntactic coherence outweighs individual diachronic shifts. To make this perhaps more obvious consider a small gedankenexperiment.

Let us assume a linguistic category that consists of three members only of which both their individual frequency developments and the development of the entire category are investigated across three time periods (P1, P2 and P3). Furthermore, for the sake of simplicity, each member may only occur with a frequency of 1, 2 or 3 per period. The overall result reported is that this category remains stable at a frequency of 6 (i.e. the sum of all members combined) across the entire span. Even with such a setup, which obviously grossly oversimplifies the complexity of an actual linguistic category (as well as any corpus data), several scenarios can be created that cast doubt on the proclaimed stability; see Figure 6.4 for some examples.
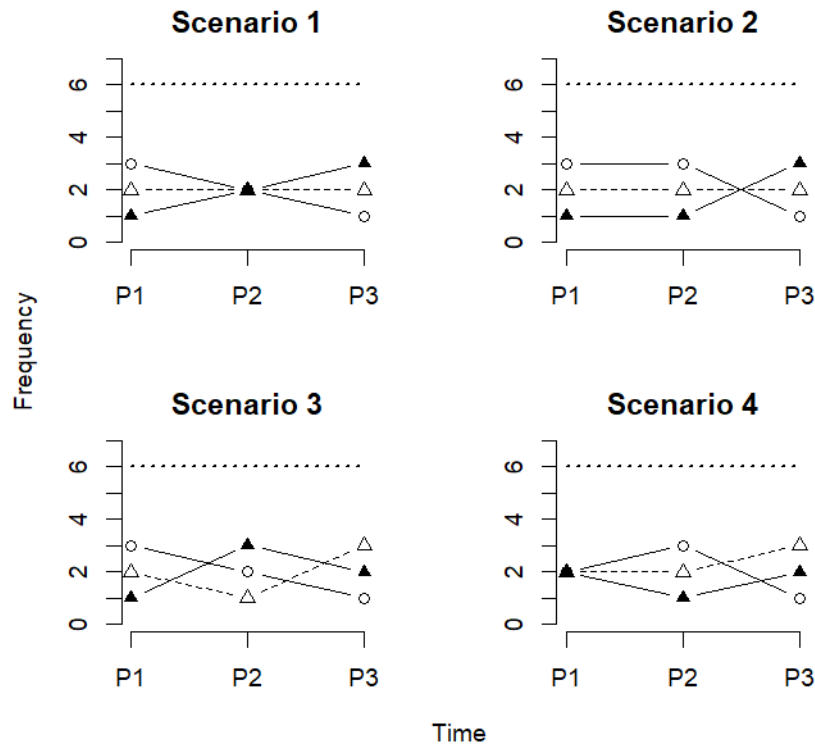
Figure 6.4. Fabricated developments in a fictitious linguistic category

When confronted with any one of these or similar scenarios within an actual linguistic category, it is arguably doubtful that the term 'stability' would be considered appropriate, even though the overall numbers (dotted lines) would indicate that. With regard to the core modal category, I assume that its special status is a remnant of a more structuralist approach to categorization according to which category membership is determined based on necessary and sufficient conditions. Admittedly, the core modals are identical in terms of their morphosyntactic properties; this, however, seems less straightforward when it comes to their meanings, despite the fact that these are historically related (e.g. Bybee et al. 1994), and even more so, if the frequency shifts are taken into consideration. Perhaps, an argument could be made that the majority of the modals fall in line with the general development and the few that buck the trend (e.g. *would*, *can* and *could* in Leech's [2011] data) should not be overestimated at the cost of a larger generalization.

By contrast, the present study explicitly advertises to look more closely at individual developments; moreover, treating modals as cxns (or more specifically parts of partly schematic cxns) reveals much more variability within that category that at least construction grammarians may need to be mindful of. To illustrate this variability, consider the developments in Figure 6.5 below.

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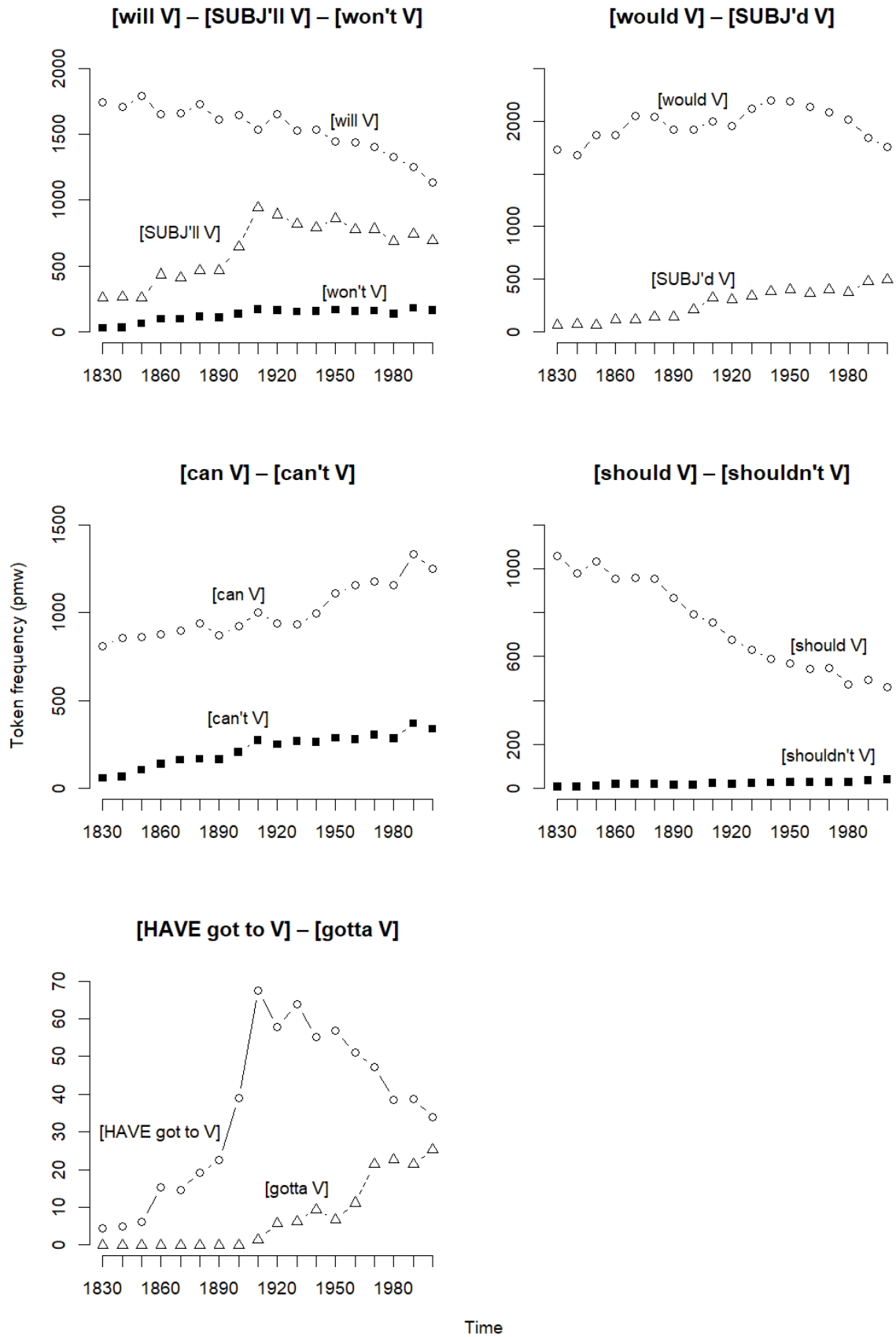
Figure 6.5. Changes in the use of selected (semi-)modal cxns between 1830 and 2009 in COHA

The graphs show the developments of different selected modal and semi-modal cxns that are often subsumed under a more general expression; for example, WILL for the cxns in the upper left-hand graph. Note, however, that only in the case of [*can* V] and [*can't* V], both lower-level cxns clearly move in the same direction, whereas the other examples do not exhibit such unidirectionality. Furthermore, the curves for [HAVE *got to* V] and [*gotta* V] at the bottom left-hand side indicate that the caution that was warranted in the case of the modal cxns applies to semi-modal cxns alike. Several studies (Krug 2000; Boas 2004; Schmidtke 2009; Lorenz 2013a) have shown that reduced forms, such as *gonna*, *wanna* and *gotta* (have started to) lead a life of their own, i.e. emancipated from their original source forms, which is why they are also treated here as distinct cxns. Note that, although not previously discussed in this paper, [*shan't* V] is also considered a cxn here, following Bergs (2008). Given its formal unpredictability, this seems justified. The present study also recognizes [*shouldn't* V] as a cxn on account of its relative preference over the full form (also when inverted), its development in the opposite direction of affirmative [*should* V], and its co-occurrence with certain verbs that has essentially led to more specified cxns with new, non-compositional meanings; for example, *You shouldn't have* as a response of 'gratitude'. For a full overview of the modal and semi-modal cxns selected to address the developments in the modal system see Figure 6.6 below.
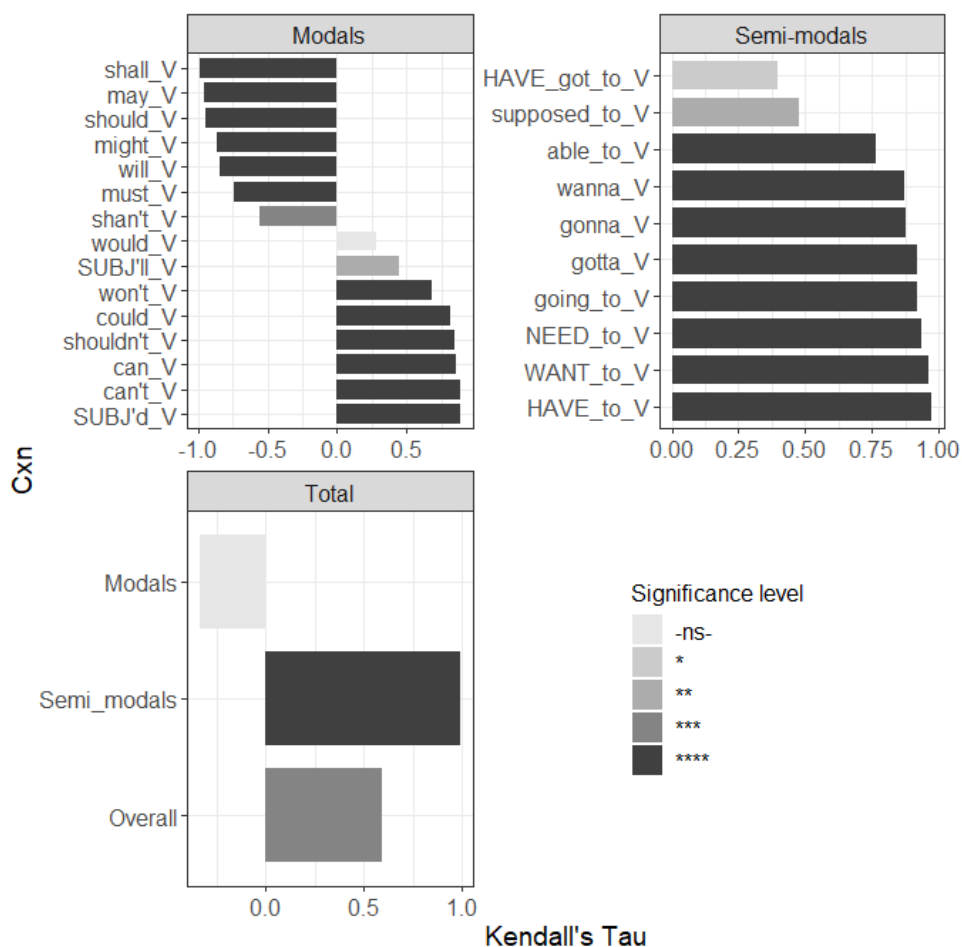
Figure 6.6. Frequency trends in selected modal and semi-modal cxns between 1830 and 2009 in COHA[78]

To identify trends in the data, Hilpert & Gries (2009) recommend using Kendall's Tau (r_τ), a non-parametric correlation statistic that is particularly suitable for assessing trends in frequency data; values close to 0 indicate no discernible trend, values close to 1 or -1 an increase or decrease respectively. For each cxn its r_τ-value is based on normalized token frequency (pmw) and represented by means of a horizontal bar plot. The different shades of grey correspond to the different levels of significance.

The results corroborate the previous claim regarding the heterogeneity within the English modal system. Consider the modal group in the upper left-hand graph. While cxns such as [*shall* V] or [*may* V] show significant, near perfect, negative correlations between usage frequency and time, cxns like [*can* V] or [[SUBJ'*d*] V] can be found on the other side of that spectrum, exhibiting strong, positive correlations that are highly

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[78] The following significance levels are distinguished: (*) $p_{two.tailed}<.05$, (**) $p_{two.tailed}<.01$, (***) $p_{two.tailed}<.001$, (****) $p_{two.tailed}<.0001$. All r_τ-values were obtained using the cor.test() function in R. The frequency data for every decade on which the r_τ-values are based are available from the author upon request.

significant. Moreover, if we follow the 'standard' procedure and aggregate their frequencies, the result is merely a weak, non-significant decline in the use of these modal cxns as whole; see the lower left-hand window.

The semi-modal cxns, on the other hand, behave as expected, showing with but two exceptions (namely [HAVE *got to* V] and [*supposed to* V]) highly significant increases between 1830 and 2009, thus presenting a much more homogenous picture. As reported in earlier studies, the semi-modal cxns are still outnumbered by the modal cxn in PDE, here roughly 3:1, but, from the current perspective, the ones selected for this study are apparently very much capable of making up for the overall decline in the use of the modal cxns if, again, the frequencies are combined. How should these findings be interpreted? Obviously, the list of modal and semi-modal cxns presented here is not exhaustive. There is no doubt that there will be many more expressions that qualify as either a modal or a semi-modal cxn and adding other cxns will undoubtedly change the overall picture to a greater or lesser extent. Whether the present findings can be seen as counterevidence to Leech's propagated, significant, overall demise of the modal category (or Millar's claim of a general increase) and the inability of the semi-modals counterbalance that trend is perhaps debatable but certainly not the point the present study is trying to make. Here, the focus rather rests on the information gained from adopting a constructionist perspective and from prioritizing individual developments over global trends, before identifying clusters within the larger category MODALS.

To elaborate, a fundamental claim of usage-based CxG (or usage-based theories of language in general) is that frequency is essential to both speakers' linguistic knowledge and language change (Bybee 2010; Diessel 2011). With regard to the cxns in Figure 6.6, we might expect the ones exhibiting significant changes in their usage frequency over time to also be the ones that have experienced some sort of change in their underlying mental representation (or degree of entrenchment). However, since the cxns under investigation here are partly schematic, it is difficult to assess, on the basis of token frequencies alone, what these changes look like exactly, i.e. whether the schemas are actually affected as whole or only some of their respective instances (cf. Stefanowitsch & Flach 2017). Arguably, this problem would be amplified if one considers the entire category, that is, if a highly abstract cxn is posited that subsumes all modal cxns and organizes them in a cluster of paradigmatic oppositions (Diewald 2009; Diewald & Smirnova 2012). While it may theoretically be possible that speakers form such abstractions, it would mean that we are back to square one by not accounting for the

modal category's internal heterogeneity neither methodologically nor conceptually. A more fine-grained analysis of modal development has the advantage that it is not only individual modal cxns that can be investigated in isolation but also their development relative to one another. The importance of relative frequency is emphasized strongly in Hilpert (2013a) who argues that "[c]hanges in these frequencies will alter the cloud of exemplars that represents [a] construction in speakers' minds" (2013a: 17). Even if contracted (semi-)modals, such as *won't* or *gotta*, are viewed purely as pronunciation variants of their respective uncontracted forms rather than distinct cxns, their developments relative to *will not* and HAVE *got to* respectively still suggest that there is something happening with the underlying mental representations that might be worth exploring. In either case, the developments discussed above constitute constructional changes in line with Hilpert's (2013a) framework. Additionally, the fact that not all modal cxns mentioned above behave or develop in exactly the same way underscores this claim, as constructional changes apply selectively to single cxns rather than to an entire paradigm as a whole.

6.5   What to split and what to lump?

This section addresses some potential consequences a rather fine-grained analysis, as the one presented above, may possibly have for the category MODALS. Because despite the fact that a usage-based, constructionist approach allows the researcher to shift the focus away from highly abstract patterns and categories towards more concrete cxns, it could be argued that the resulting level of granularity also introduces more complexity and renders the data less readily interpretable or rather the conclusions drawn from them less elegant. A usage-based CxG approach to modality should not, however, be misinterpreted as merely a pedantic search for modal cxns (especially at a lower level) which are then only treated separately. The present study very much acknowledges the usefulness of grouping modal expressions in general, but also takes the view that, when investigating the historical development of modals (or any other linguistic unit for that matter), (relative) frequency, among other factors (e.g. functional overlap, formal resemblance, similar usage profiles), can play a role in identifying larger, more uniform groups. That is, if the developments of two or more expressions are similar enough, it may help the researcher

uncover categories in a more data-driven, bottom-up fashion, which, from usage-based theory of language, may then perhaps also be cognitively more realistic.

To illustrate, Hilpert (2013a: ch. 3) investigates the development of the first and second person possessive pronouns *mine* and *thine* and their change to *my* and *thy* respectively between 1150 and 1718. By means of different statistical methods (e.g. cluster analysis, mixed-effects modelling), he comes to the conclusion that the pronouns' individual developments are so similar that they constitute a single constructional change rather than two isolated changes, which he sees as evidence for the existence of a more abstract constructional generalization (a so-called meso-cxn) speakers must have formed over these possessive pronouns in the time period under investigation (Hilpert 2013a: 106–109). Hilpert thus provides empirical evidence that the first and second person pronoun forms form a natural category of which the third person is apparently not a member. Moreover, he shows that it is not only the status of an expression as cxn that can be determined in an empirical, bottom-up fashion, but also its level of schematicity.

Another example of a data-driven categorization, yet with a different focus and conclusion, is proposed in Lorenz (2020). He finds that the emerging modals *gonna*, *wanna*, *gotta* increasingly converge in their respective usage patterns in AmE over the course of the 20th century. But instead of arguing for a more abstract contraction cxn, he identifies a meta-cxn that captures the contractions' similarity and the analogical relationship to their full forms via horizontal links without recourse to a higher, more schematic level. Crucially, the observed developments are unique to *gonna*, *wanna* and *gotta*, i.e. other contractions that have emerged from the V *to* V$_{inf}$ cxn (e.g. *usta*, *oughta*, *tryna*) follow different paths.

Based on the data at hand, a rather cursory attempt can be made to group some modals into larger clusters. A set that seems to behave particularly homogeneously are (some of) the negative modal contractions. Next to their morphosyntactic similarity, they all share the functional properties 'not X' and 'colloquialness', whereas the latter seems to be waning as these contractions continue to disseminate into more formal registers.[79] Furthermore, a closer look at their developmental trends in Figure 6.7 seems to support a unified treatment of these expression.

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[79] The property 'not X' does not necessarily mean that the respective contraction is always the direct negation of the affirmative form, as argued in Bybee (2010) on the basis of *can* and *can't*.
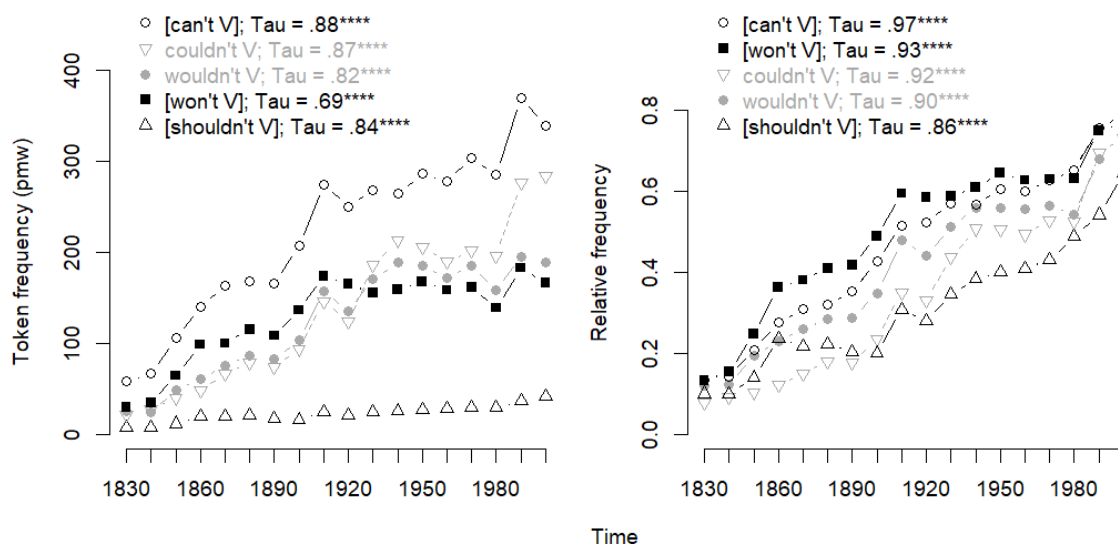
Figure 6.7. Absolute and relative development in usage frequency of specific negative modal contractions in COHA[80]

Despite the differences in their overall usage frequency, the progressions in the left graph show that each of these negative modal contractions have generally become more frequent between 1830 and 2009 in AmE. Even more noteworthy, the contractions behave very much alike in terms of their development relative to their respective full forms, as indicated by the graph on the right. By the 2000s, the chances of encountering a negative modal contraction over its uncontracted counterpart in contexts where both should theoretically be possible are roughly between two to four times higher. However, not all negative contractions follow this upwards trend. Forms like *needn't* or *mustn't* have become increasingly marginalized in terms of their absolute frequency after the 1910s and, unlike the contractions in Figure 6.7, they remain underrepresented in comparison to their respective full forms in COHA; Figure 6.8.

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[80] Note that the status of *couldn't* and *wouldn't* as cxns is yet to be determined. Given their relative preference over their respective full forms, it seems questionable to treat them as mere contracted pronunciation variants of *could not* and *would not*.
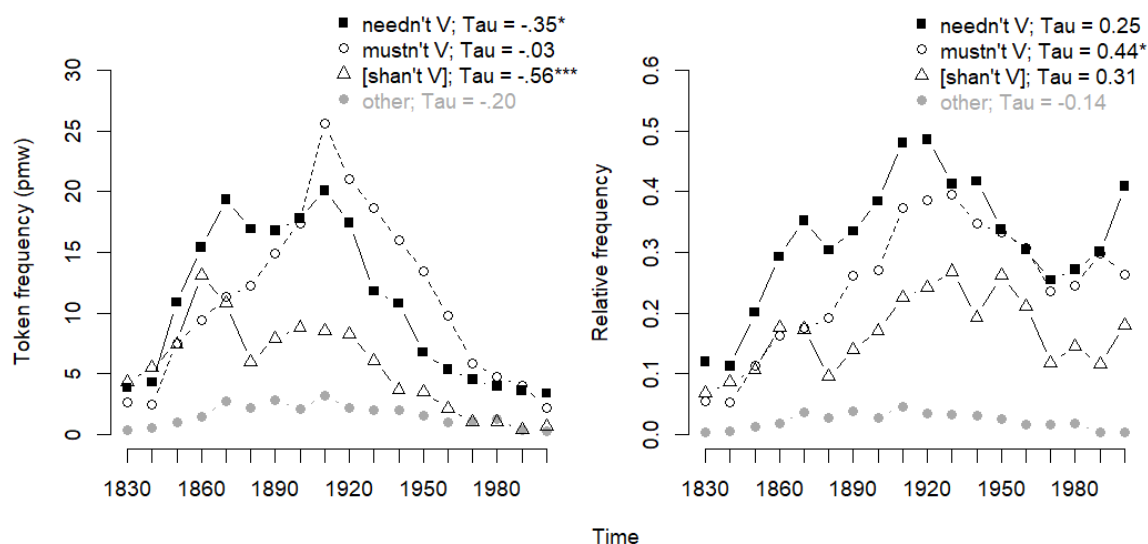
Figure 6.8. Absolute and relative developments of marginalized negative modal contractions in COHA[81]

What can we make of these findings? Obviously, the present analysis lacks the depth and precision that both Hilpert (2013a) and Lorenz (2020) provide in their studies to argue for the existence of either a meso-cxn or a meta-cxn, but it provides a clue where to dig deeper. Since these cxn types describe different kinds of relationships in the construct-i-con, they are not necessarily mutually exclusive and may both apply to the present data. Whereas the meso-cxn represents a more abstract, partly schematic generalization across a set of cxns somewhere above the level of individual cxn types (cf. Traugott 2008; Hilpert 2013a), the meta-cxn rather captures the horizontal relationship between near-synonymous expressions (cf. Leino & Östman 2005; Lorenz 2020).

To tentatively flesh this out for the present data, we can assume a meta-cxn that accounts for the relatedness between a negative modal contraction and its full form (e.g. [*won't* V] and *will not* V as near-synonyms) as well as the analogical relation between pairs of contractions and full forms (e.g. [*won't* V] and *will not* V relate to each other in the same way as [*can't* V] and *cannot* V). Following Lorenz (2020), that meta-cxn could be formalized as <[AUX *not* V$_{inf}$] – [{*won't* | *can't* | …} V$_{inf}$]>.

A meso-cxn is no less conceivable. In Section 6.3, I have already mentioned the possible existence of a schema in the form of [X-*n't*] that speakers may have abstracted from the different *n't*-types that exist in English. For the present study, this schema would certainly have to be extended as to include the following bare infinitive — [X-*n't* V$_{inf}$] —

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[81] The category 'other' represents the aggregate token frequencies of the very rare contractions *mayn't*, *mightn't* and *daren't* followed by a bare infinitive.

not only to account for possible collocational preferences, but also to demarcate it from the negative contractions of the primary verbs BE and HAVE, which clearly have different syntactic distributions. While all negative modal contractions could, in theory, be instances of the meso-cxn [X-*n't* V$_{inf}$], it remains to be seen whether the cases in Figure 6.7 converge in their respective usage patterns beyond their development in text frequency (e.g. overlap in their collexemic profiles or variables pertaining to the speaker). If this is indeed the case, it might allow us to posit another meso-cxn for specifically that group. What is more, this meso-cxn might not only be instantiated by typical negative modal contractions, such as [*won't* V] or [*can't* V]. By the same token that forces us to distinguish between the modals and BE and HAVE, the contracted negative present tense form of periphrastic DO, namely *don't*, needs to receive some attention, as it shares its syntactic properties (i.e. its operator function in NICE and the following bare infinitive) with the other negative modal contractions. Although periphrastic DO is traditionally not considered a modal expression, Budts & Petré (2020) argue that the overlap between the infinitival collocates of DO and the modals in Early Modern English, especially *will*, promotes the inclusion of DO among the modals, as speakers will have perceived specific forms of DO and specific modals as similar enough to assume a paradigmatic relationship. Again, the present study cannot claim to have employed the same rigor, but from the spine plot in Figure 6.9, it becomes clear that the diffusion of the cxn [*don't* V] in COHA between 1830 and 2009 is remarkably similar to the patterns observed in Figure 6.7. Especially the phonological similarity between [*don't* V] and [*won't* V] invites analogy and may, in part, explain their similar developments.
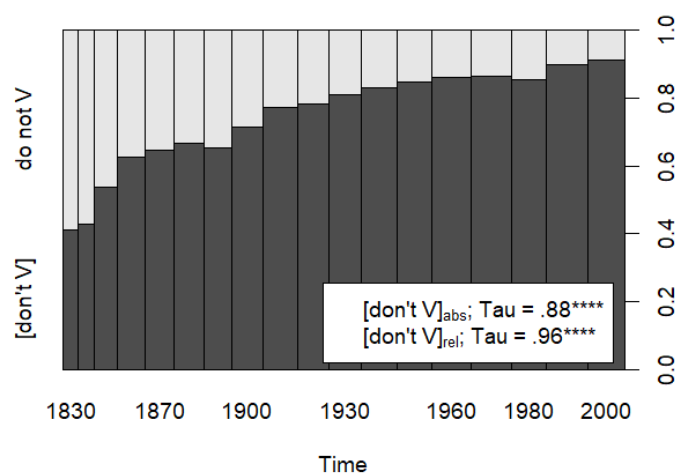
Figure 6.9. The spread of the [*don't* V] cxn in COHA

To conclude, the issue regarding what to split and what to lump depends first and foremost on the research question. A first attempt was made to identify a coherent group of lower level cxns within the larger category MODALS by not only considering syntactic and functional properties, but also simple diffusion patterns. Some of the negative modal contractions show noteworthy uniformity in this regard. Yet, whether or not we are dealing with a meta-cxn or (multiple) meso-cxn(s) in their case, or whether [*don't* V] is actually sanctioned by the same schema cannot be answered with certainty based on the present data. They might, however, facilitate further investigations, particularly a more encompassing treatment of this category beyond the traditional conception of what constitutes a modal.

6.6 Conclusion

This study has tried to make the case that an investigation into modal development in English (more specifically AmE) has still something to offer, despite the noteworthy research output on this topic that exists already. By approaching the modal category and its development from a usage-based, constructionist perspective, several lower-level modal cxns (e.g. [*will* V], [*won't* V] or [[SUBJ*'d*] V]) were identified and it was shown that their individual behavior can be described as anything but uniform. Based on this, it was claimed that it may be more fruitful, at least initially, to focus on individual trends rather than the development of the entire category as a whole, as the modal system behaves simply too heterogeneously to be accurately described by either a proclaimed overall demise (Leech 2011) or a general increase (Millar 2009). However, by zooming in on the developmental trends of lower-level modal cxns, it was possible to identify quite homogenous inter-categorial changes. This was particularly noteworthy for a group of negative modal contractions, whose similar diffusion might be evidence for the existence of possibly both a hierarchical meso-cxn abstracted from forms like [*won't* V] and [*can't* V] and a meta-cxn that captures the analogical relation between these contractions and their full forms.

The resulting level of granularity this approach brings about may arguably be considered not very elegant but within a usage-based model of language probably cognitively realistic. While the present study does not mean to impose subscribing to the

same framework, it has hopefully shown some of its potential and has provided fresh perspective on a long-standing issue, i.e. the question about what is happing to the English modals.

7 General discussion

This chapter brings together the results and discussions from the previous chapters and evaluates their contribution. It was the main aim of this study to show that changes in the modal system of AmE are notoriously heterogeneous and thus best qualify to be treated as constructional in nature. Any claims regarding any directed overall diachronic trends of entire categories can be relativized if long term developments, frequency shifts of individual modal expressions, emancipating contracted forms, the gradient nature of the categories themselves, and changes in the associative links that modal expressions entertain are taken into consideration. By combining corpus-based, data-driven methods with different, usage-based approaches to language change, modal development was traced at much higher level of resolution than in previous studies. Specifically the insights from rather node-centered (D)CxG approaches and more network-oriented models provide a fresh perspective on the well-studied subject that is modal development. Not only was it possible to achieve a higher degree of descriptive accuracy and thus a better understanding of the development of modal verbs and semi-modals, but the present work also provides suggestions on how grammatical categories can be approached in general from a diachronic perspective, namely by utilizing converging evidence from different frameworks. The following sections will reflect on the results and arguments presented thus far and outline some issues to be considered for future research.

7.1 Constructional changes and the modal domain

Arguably, the most apt description of what has been happening to the modal system in AmE over the past ~200 years is a significant restructuring. This admittedly rather broad assessment represents the common denominator of the findings on changes in the use modal expressions obtained and discussed in earlier research as well as in this work. A recurrent result across the different case studies presented here is that both the modal verbs and the semi-modals, as the main categories of expressing modality in English, exhibit noteworthy intra-categorial variability in terms of changes in their distributional behavior, which has called into question whether a unified treatment of the elements

within is justified. The introductory chapter outlined four central, interrelated claims regarding this restructuring process that we are now in the position to revisit.

Changes in the modal system are primarily constructional in nature. All four case studies attested to the fact that the developments pertaining to modal expressions are highly diverse and complex. With regard to the core modal verb category, this observation may be somewhat of a surprise, considering that the morphosyntactic and functional properties shared by its members point to a clearly demarcated, coherent group. Historical corpus data, however, indicate that the modal verbs have not been developing in lockstep in the recent history of AmE. While some modal verbs have declined significantly in their frequency of use over the last two centuries (e.g. *shall*, *may*), others have become more frequent (e.g. *can*, *could*). Moreover, the observed trends manifest at different rates and may not be unidirectional over the entire course of the 19th and 20th centuries. Such findings lend support to the claim that these changes are most usefully seen as constructional changes (Hilpert 2013, 2016a, 2021). Recall that constructional change affects individual constructions rather than large groups or entire paradigms (Hilpert 2013: 16). Given that a directed trend that pertains to all members of the modal verb category cannot be identified, speakers may not entertain a common generalization over all modal verbs, which makes a constructionist approach that emphasizes the role of generalizations at a low(er)-level of abstraction more appropriate to address the changes at hand. On the surface of it, this claim makes explicit commitments to constructionist frameworks, which requires conceiving of modal expressions as constructions, that is, as symbolic form–meaning pairings. For the case studies presented in Chapters 4–6, this is unproblematic, as their results and discussions were explicitly measured against the cognitive-functional, usage-based underpinnings of DCxG. But considering that the first case study of the present work was conducted from a framework-open perspective (cf. Chapters 2 and 3), it is fair to ask whether the concept of constructional change should be utilized outside of its intended context — after all, Hilpert's original (2013) formulation of what constitutes constructional change was firmly integrated into DCxG. The present work argues that, despite no explicit mentioning of or commitment to DCxG or any related frameworks, the findings from Chapter 3 are nonetheless very much in line with the ideas of constructional change. For one thing, modal verbs constitute constructions by definition, on account of being words, which are symbolic in nature; likewise, the semi-modals, despite their multi-word structure, constitute units that trigger specific symbolic associations. And for another

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thing, the focus rested specifically on tracing the individual developments of modal verbs and semi-modals and how this perspective relativizes conceptions about any alleged uniformity pertaining to proposed groupings within the respective categories, let alone the categories as a whole (cf. Leech 2003, 2011). This conforms to the most important aspect of constructional change, namely that it operates selectively. Hilpert even points out that DCxG is flexible enough to be chosen purely "as a descriptive framework that favors a perspective on changes in individual form–meaning pairs, but any reference to the psychological reality of these form–meaning pairs can be left implicit" (Hilpert 2018: 23). The results from the first case study can therefore also be seen as a valuable contribution to the discussion on constructional changes in the modal domain.

In addition to formal and functional properties, (relative) frequency shifts and usage-profiles of modal expressions may serve as historical signposts for their categorial status or lack thereof. Among other things, constructional change explicitly includes any changes that pertain to the distributional properties of a form–meaning pair, that is, any aspect of its frequency (Hilpert 2013: 16); for example, absolute and relative frequencies or collocational preferences (based on transitional probabilities or contingency-based measures). The general idea is that if two or more constructions develop alike in terms of their frequencies and usage-profiles, speakers may perceive them as similar enough to form some kind of common generalization over them (cf. e.g. Budts & Petré 2020; Hilpert 2013). By contrast, if the distributional evidence points to diverging developments, a unified treatment of the constructions under consideration may not necessarily mirror the knowledge represented in the minds of speakers. The present work has repeatedly shown that, more often than not, modal expressions have not been behaving homogenously regarding their respective developments in AmE, despite their morphosyntactic coherence. Assuming a common generalization at a higher level of abstraction over all modal verbs, or even all verbal expressions of modality — a hyper-construction (Diewald 2009, 2020) — would force one to completely neglect the empirical evidence presented here. In fact, the distributional data (i.e. relative frequency changes and distinctive collocational preferences) have shown that a common generalization at a more abstract level might not even exist for contractions and their respective, historically-related full forms, considering the ongoing emancipation process patterns like [[SUBJ*'d*] V], [[SUBJ*'ll*] V], [*can't* V], and [*won't* V] have been undergoing (cf. Chapters 4–6). More abstract generalizations may of course still be possible but perhaps at a lower level affecting merely a local group. For some of the negative modal

contractions discussed in Chapters 6, it was shown that they behave very similarly regarding their distribution in COHA both in absolute terms and also relative to their respective full forms.[82] Along with the fact that they all share the substantive element *n't* and common pragmatic associations with more colloquial registers, this could justify postulating a generalization in the form of the more abstract schema [X-*n't* V$_{inf}$]. Presumably, newly encountered tokens of negative modal contractions would hence be registered in the same exemplar cloud, and all 'core' uses would be fully licensed by that schema (cf. Langacker 1987: 66; also Figure 6.7). Peripheral uses such as *mayn't* V or *shan't* V, on the other hand, although formally compatible with [X-*n't* V$_{inf}$], may only receive partial licensing, due to the conflicting pragmatic associations (i.e. formal vs colloquial) evoked by both modals and the schema respectively (cf. Bergs 2008; also Sections 4.2 and 6.5). As a consequence, speakers may perceive them as less well-formed, which, among other things, explains why they have remained rare in language use. Alternatively, relationships between modal expressions might also be captured without recourse to a more abstract level but by assuming horizontal links instead and drawing on speakers' cognitive abilities of analogy-making (see e.g. Lorenz 2020). In any case, distributional data should factor in when it comes to identifying coherent groups or (sub-)categories and not simply be outweighed by other properties pertaining to form and function. Conversely, frequencies must be treated with caution to avoid running inadvertently into spurious correlations (Koplenig & Müller-Spitzer 2016; Hilpert 2020).

Paradigmatic competition operates across established modal categories as well as within, all the way down to the alternation between contractions and full forms. Next to the core modal verbs, English embraces a large, heterogeneous set of periphrastic expressions, commonly known as semi-modals, to express modality. The semi-modals' ability to convey very similar meanings as the core modals verbs, while at the same time being morphosyntactically much more flexible, has promoted lively competition in selected onomasiological spaces. Famous cases include the competing expressions of 'obligation' and 'necessity', namely *must*, HAVE *to*, (HAVE) *got to*, and NEED *to*, or *will* and BE *going to* as markers of 'intention/prediction/futurity'. Since both categories represent many-to-many-mappings, intra-categorial competition for selection can also be observed; see, for example, *can* vs *may*, *may* vs *might*, or HAVE *to* vs NEED *to*. Adding to

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[82] By following the procedure described in Section 1.1, it can be shown that, in terms of their decadal changes, the respective trends of the negative contractions *can't*, *won't*, *couldn't*, *wouldn't*, and *shouldn't* (all followed by a bare infinitive) are significantly positively correlated almost without exception; see Figure A3 in the Appendix.

this and of particular importance in the context of the present work was the competition that holds between full forms and their contractions. For the semi-modals BE *going to*, (HAVE) *got to*, and WANT *to*, several studies have shown that treating their respective contractions, namely *gonna*, *gotta*, and *wanna*, separately is motivated on distributional, functional, and also psycholinguistic grounds (e.g. Krug 2000; Lorenz 2013a; Schmidtke 2009). The present work provided evidence that similar claims can be made for selected modal contractions. The modal enclitics *'d* and *'ll*, and some negative contractions, especially *can't* and *won't*, which are traditionally conceived of as colloquial, pronunciation variants were argued to be in the process of emancipating themselves from their respective full forms. By utilizing diachronic corpus data and different corpus-linguistic methods to detect distributional changes pertaining to usage frequencies, collocational preferences, senses, and diffusion in the speech community, it was demonstrated that these contractions and their full forms have clearly not been patterning congruently. For example, *can't* seems to be preferably used in contexts referring to '(inherent) inability', whereas *cannot* is relatively more often used to convey 'epistemic' or 'circumstantial impossibility', as well as 'impermissibility'. Concomitant to that development, the contraction has also become significantly more frequent than its full form. The modal verb *would* and its cliticized form *'d* also differ in their syntagmatic associations, in that the former is more strongly associated with inanimate subjects (e.g. *it*, *that*) and stative verbs (e.g. *be*, *have*, *seem*), which, when combined, can confidently be predicted to convey epistemic meaning. The enclitic, on the other hand, shows relative, mutual attraction with animate subjects (e.g. *I*, *we*) and emotional state/mental activity verbs (e.g. *like*, *love*, *think*). Obviously, there is no reason to assume that speakers do not recognize any similarities between these contractions and their full forms. But from a more radically usage-based perspective, it is possible that they are not, or at least no longer, instances of a common generalization at a higher level of abstraction. Nor does it seem motivated to assume that, for example, *won't* is somehow actively derived from *will not* or *will* and a *not*-construction during retrieval. By assuming separate entries for full forms and their contractions, it is possible to avoid what Hilpert (2016b, 2021) has referred to as the 'fat-node problem', that is, the amount of information stored in a construction relative to the amount of information stored in the connective links between constructions. The approach adopted here has focused more on changes in the associations that modal verbs and their contraction entertain with their immediate co-text. From a diachronic perspective, this seems a more fruitful enterprise, as these are the kinds

of changes that can be observed in usage-data. And it is exactly these data that point to the differences between modal verbs and their contractions beyond the formal–vs–colloquial distinction.

The distributional hypothesis *is of particular importance in diachronic linguistics and thus for studying changes in the modal domain.* The final claim represents the methodological consequence of everything discussed up to this point. The role of frequency as an indicator of (lexcio-)grammatical change, even over relatively short periods of time, is very much undisputed and corpus linguists have repeatedly capitalized on this proposal to explore the developments of modal expressions in English. Chapter 3 provided large-scale evidence that both the modal verbs and the semi-modals have undergone significant changes in their frequency of use, which were taken to be evidence for an ongoing restructuring process in the modal system of AmE. Beyond tracing changes in text frequency, distributional data can provide access to hidden semantic structures and, depending on their operationalization, changes in the degree of entrenchment and conventionalization of different modal expressions (Schmid 2020; Stefanowitsch & Flach 2017). These hidden semantic structures must not necessarily be understood as 'new' meanings that had previously not been discovered. Rather they suggest functional re-arrangements whereby the syntagmatic associations between a given modal expression and specific (clusters of) verb infinitives, or certain subject–infinitive combinations are strengthened. The case study in Chapter 4, for example, showed that *will not* has developed a relative preference over *won't* to be used with verbs that point to an 'unwillingness' interpretation (e.g. *permit*, *tolerate*, *accept*). While these verbs are not exclusive to the full form, the preference signals that the syntagmatic associations between them and *will not* have become relatively stronger, which could be interpreted as an increasing degree of (average) entrenchment and conventionalization of these particular connections (cf. also Section 6.3). Importantly, this preference cannot be attributed to overall text frequency. Instances such as *will not have* or *will not do* are generally more frequent than, for example, *will not permit* or *will not tolerate* but are statistically dispreferred, that is, they occur significantly less often with *will not* than would be expected by chance. The contracted form *won't*, on the other hand, has become relatively more strongly associated with verbs that make an epistemic reading more probable (e.g. *mind*, *matter*, *believe*). Of course, this is all a matter of degree. Given the historical relatedness between contractions and their full forms, overlap can be expected. In extreme cases, however, a combination might exhibit such a high degree of cohesion

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that contraction and full form cannot simply be interchanged without changing the meaning of the utterance. Consider the sequence *I'll bet* 'conveying confidence, agreement (possibly with a sarcastic undertone)', as in (33) and (34).

(33) There are a thousand paths in these tunnels and only a few of them pass by here. Came down here with a woman, did he? A pretty one, too, **I'll bet**. [COHA, FantasySciFi, 2001]

(34) CANDY: He gives me money for whatever I want.
KAREN: But you have to ask?
CANDY: Uh huh. It's worked out pretty well really. It is hard sometimes to ask him for money for underwear and stuff.
KAREN **I'll bet**. [COHA, Play:ODOnParadise, 1982]

The full form *will* is unavailable in such communicative settings. In fact, the sequence *will bet* is typically followed by an explicit wager, thereby evoking a literal interpretation. Again, in terms of overall text frequency, *I'll bet* does not figure as prominently as other sequences, but it ranks among the top if contingency information is taken into consideration (cf. Chapter 5). Admittedly, exceptions of this kind are probably also accessible to intuition. But when it comes to all the 'in-between' cases, distributional data can provide a more solid approximation of what is idiomatic and what is less so (Flach 2020a; Wulff 2009); compare the examples in in (35) and (36).

(35) But, the worst is over, Meggie, meeting my parents. You will be friends with my mother – **you will see**. My father, he is not a man anymore, so it is not possible. [COCA, TheLiteraryReview, 2018]

(36) "Think of disappointment as a happy little surprise, Comfort. For instance..." Great-uncle Edisto pushed his glasses up on his nose and smiled like he had just invented a new thought. "I think I'll get me a nap." He was breathing hard. "There's always something good to come out of disappointment, Comfort. **You'll see**." [COHA, EachLittleBird, 2006]

Rather than making a reference to a visual experience, the sequences *you will see* in (35) and *You'll see* in (36) both convey 'assurance' or 'confidence about the interlocutor's realization', motivated by the conceptual metaphor UNDERSTANDING IS SEEING (Johnson 1987; Lakoff & Johnson 1980). To what extent acceptability judgments could help identify the degree of (dis-)similarity between the two sequences from the examples

cannot be assessed here. Corpus data, on the other hand, indicate that, in this particular syntactic configuration, *see* is more strongly associated with *you'll* than *you will* in PDE. They also indicate that the metaphorical use with the full form, albeit attested, is comparatively very rare, which suggests that *you'll see* and *you will see* might end up at different positions somewhere on the acceptability cline. These findings corroborate the understanding that frequencies and quantitative methods may not only make a substantial contribution to addressing notions such as entrenchment, conventionalization, and idiomaticity, but that their utilization is imperative in light of this work's diachronic dimension.

7.2 From 'framework-open' to dynamic, usage-based approaches to modal development

The present work investigated the modal system from different perspectives, subscribing to various aspects from more or less related frameworks. The following sections will reflect on this course of action, discuss the contributions, advantages and (potential) disadvantages of each approach, and conclude with a consensus on utilizing converging evidence to better understand and explore grammatical changes.

7.2.1 A framework-open approach

Chapter 2 of the present work proposed dividing corpus-based variationist studies on the development of modal expressions into two main camps: 'framework-open' and 'framework driven'. Recall that this distinction did not pertain to the absence or presence of any theoretical motivation but specifically to the absence or presence of explicit grammatical theoretical commitments to formal or functional frameworks. Based on this broad division, the majority of the studies concerned with changes in the modal system were claimed to fall into the framework-open camp, as does the case study in Chapter 3 of the present work. Since this case study was mainly guided by the aim to extend the previous research on the diachrony modal verbs and semi-modals in AmE, most notably Leech (2003, 2011), Millar (2009), and Mair (2015), with corpus data from on the 19th century but without any firm preconceptions on how this development will unfold, its approach can largely be described as exploratory. Its two main contributions lie in the

comprehensive description of how modal verbs and semi-modals have been developing in AmE since the 1830s, thereby relativizing the established conception about the longevity of modal decline to some extent. And, more importantly, it drew attention to the heterogenous nature of this development, which cast serious doubts on whether modals can really be usefully grouped in the ways proclaimed in previous research. These findings are both conceptually as well as methodologically relevant because they have shown how investigating long(er)-term diachronic developments changes the perspective on trends in the data (cf. also Mair 2015), and they have also illustrated (or rather corroborated) the importance of minding individual frequency shifts. In terms of its explanatory value, the study joined the ranks of other framework-open endeavors, which typically draw on ideas from grammaticalization theory (e.g. Bybee et al. 1994; Heine 1993; Hopper & Traugott 2003) but also seek explanations for their obtained results at the discourse or macro-sociological level. Factors such as *colloquialization*, *democratization*, prescriptive influences, stylistic changes, and others have frequently been mentioned within the context of modal verb and semi-modal development (see e.g. Leech 2003; Leech et al. 2009; Mair 1997; Millar 2009; Myhill 1995). For all factors, shifts in simple text frequencies are regarded as a symptom, either boosting the usage of a modal expression or potentially slowing it down. Although it may not always be possible to clearly disentangle the forces that affect the language system from within and those that affect it from the 'outside', the combination of language-internal and language-external explanations to address changes in the modal system should be seen as an advantage of framework-open approaches, especially since language-external forces are usually not too well integrated into framework-driven research (but see Schmid 2020). In sum, framework-open approaches tend to provide a bird's eye view on how the development of modal expressions unfolds across time, they are usually methodologically simple(r), and they offer a diverse description of the changes at hand.

There are, however, at least two things to consider. First, framework-open approaches to modal development seldom question the validity of established linguistic categories, or established practices regarding for which expressions the data can be conflated; compare the discussion from Section 2.1.3 on total accountability. With regard to modal verbs and semi-modals, this becomes evident when global trends for an entire paradigm are reported or when different morphosyntactic configuration (e.g. full forms and contractions, NICE environments) are subsumed under a single expression (e.g. SUBJ*'ll* V, *will* SUBJ V, *won't* > WILL); but see, for example, Berglund (2005) or, based on

BrE data, Nesselhauf (2012). The practice itself is usually made explicit and, from a scientific standpoint, plausible insofar that it perhaps leads to a larger generalization. It is, however, also more prone to imprecision; cf. the discussions in Sections 2.1.3 and 6.4–6.5.

Second, the explanatory factors mentioned above, although very intriguing, are usually not crosschecked regarding their status as causes, symptoms, or both; nor is it made clear how language-external forces interact with language-internal ones. The notion of colloquialization is particularly interesting in this regard. Next to grammaticalization, it has arguably been one of the most cited explanations for the increasing use of modal contractions and semi-modals, and their spread into more formal registers. While this observation is robust, it does not explain why such a process would be initiated in the first place. There is no doubt that colloquialization in progress will have effects on the conventionalization of modal expressions and their diffusion (Schmid 2020: 193–194), but it seems odd to assume that the process is somewhat self-triggering or solely based on conscious decisions by speakers to sound more colloquial. To illustrate, consider the alternation between *must* and HAVE *to*. While the semi-modal has clearly taken over some of the onomasiological space of the core modal verb, it is also generally acknowledged that they convey similar yet not identical meanings, let alone have the same sense distribution. If HAVE *to* conveys a meaning or expresses a function that is not available or less preferred with *must*, then colloquialization should perhaps be regarded as the manifestation of language-internal pressures whereby formal registers increasingly embrace the use of colloquial expressions to meet the functional needs of speakers. In turn, if speakers realize that using colloquial expressions becomes more and more acceptable in formal contexts, colloquialization exerts influence on the pragmatic associations speakers have with a given linguistic pattern (i.e. from 'colloquial' to 'generally acceptable'), which furthers the diffusion. As a consequence, colloquialization constitutes both a symptom of language-internal change and a possible catalyst for further changes.

7.2.2 A cognitive-functional, usage-based approach

Chapters 4–6 made the case that both the descriptive accuracy as well as the explanatory value regarding changes in the modal domain can be increased substantially if they are addressed from a cognitive-functional, usage-based perspective. Crucial to this

assessment was a constructional treatment of selected modal expressions in the CxG sense or a dynamic treatment in the sense of the EC-Model. This was not merely a simple case of relabeling but required a close inspection of formal, functional, and distributional properties of the items under consideration to come to terms with how they fit into these frameworks exactly. Essentially, this approach constitutes a re-perspectivization on (changes in) the modal domain which shows on different levels.

Conceptually, treating modal verbs and semi-modals as constructions that consist of the respective modal expression as the pivotal element and (at least) the following bare infinitive (e.g. *can* V, or HAVE *to* V, SUBJ*'ll* V) does not only underscore their status as symbolic form–meaning pairings but also incorporates the idea that they are part of a larger associative network (Goldberg 1995, 2006; Hilpert 2012, 2016; cf. also Sections 4.3, 6.3). Other than framework-open approaches, which usually utilize co(n)textual cues on demand, that is, when close semantic analyses are carried out, the usage-based approach to modality adopted in the present work assumes that speakers have probabilistic knowledge of the syntagmatic associations between a given modal expression and its immediate co-text (cf. Hilpert 2016: 69–70, 82). This has at least two consequences: (i) the meaning of modal constructions is contingent on the elements with which it is strongly associated, and (ii) the knowledge about these associations and by extension its meaning cannot be predicted based on any other modal construction, which also entails that every modal construction can be expected to have a (more or less) unique collocational profile. Chapters 4 and 5 specifically built on these conceptions to argue that some modal verbs and their contracted forms (i.e. enclitics and negative modal contractions) deserve a separate treatment. It was shown that some contractions are not formally predictable by means of any known morphological pattern (cf. e.g. *will not > won't*), which means they must be stored separately in the minds of speakers on any account. Additionally, the case studies provided evidence that contractions differ from their respective full forms in terms of their collocational preferences, which, under the assumption of the distributional hypothesis, translates into meaning differences.

Methodologically, the usage-based, constructionist view is lean in the sense that syntactic configurations are largely specified by assuming the general form (SUBJ +) MODAL EXPRESSION + V. On the one hand, this means that only a part of the modal system and its changes could be modelled that way and any direct comparison with previous, framework-open investigations had to be treated with caution. On the other hand, different syntactic environments logically entail different syntagmatic associations and

recent studies have shown that the use of modal expressions is in fact contingent on the syntactic context (Flach 2020a; Hohaus 2020). Keeping at least some of the different syntactic environments separate was therefore warranted on both conceptual and methodological grounds. Also, the usage-based view invited a more rigorous statistical exploitation of the data beyond simple text frequencies (e.g. cluster analyses, dispersion measures, contingency-based measures, LNRE models) in order to (i) address changes in the use of modal expressions, (ii) account for the variability in their schematic slots (i.e. SUBJ and V), and (iii) identify or question the level of abstraction at which a more schematic generalization may be postulated. Clearly, the same methods can be employed in any corpus-based study regardless of any theoretical commitment. However, within the usage-based context of the present work, they also had conceptual merits as possible operationalizations of constructional change, emancipation, and entrenchment and conventionalization pertaining to the modal expressions under investigation. The combination of the usage-based assumption about speakers as intuitive statisticians with data-driven, bottom-up approaches arguably led to a more robust, cognitively realistic, and psychologically plausible assessment of changes in the modal domain.

Empirically, three major findings can be attributed to specifically adopting a DCxG perspective to changes in the modal domain. First, some modal contractions (i.e. negative contracted forms and enclitics) cannot generally be subsumed under their respective full forms but deserve to be treated separately as constructions or patterns of associations in their own right. This is not a trivial matter. Contractions are not automatically constructions by virtue of being contractions. The decision to treat them as constructions was empirically motivated. It was shown that the distributional behavior (e.g. usage frequencies, collocational preferences) of selected contractions diverges significantly from that of their historically related full forms (even if genre-specific distributions are accounted for).

Second, the results provided further evidence for the general claim that contingency information provides, among other things, access to the constructional semantics of modal verbs and allows for an operationalization of their entrenchment and conventionalization (e.g. Gries & Ellis 2015; Stefanowitsch 2013; Stefanowitsch & Flach 2017). For instance, comparing *will not* and *won't* or SUBJ *will* and SUBJ *'ll* based on the verbs with which they occur most frequently would not reveal anything meaningful because, as can be expected, these verbs are in all cases *be* and *have*. However, by abstracting away from raw frequencies, it was possible to show that each form has

distinctive preferences for specific verbs or verb clusters, which allowed for an assessment of the modal constructions' entrenched and conventionalized meanings.

Third, a recurrent result throughout this entire work was that establishing some kind of uniformity regarding the development of modal verbs as group is likely to fail considering the divergent trends observable. While this was already acknowledged in Chapter 3, the case studies from Chapters 4–6 substantiated that impression considerably by treating modal verbs as constructions, which revealed even more variability in the data. These observations gave rise to the suspicion that, despite the modal verbs' morphosyntactic coherence, speakers may not necessarily form a common, highly abstract generalization over all of them. At a lower, more specific level, however, it was found that some modal expressions (e.g. the negative modal contractions; cf. Section 6.5) have been behaving rather homogenously in terms of their distributions, which was taken as a possible indicator of a common abstraction in form of a meso- or meta-construction.

Additionally, at numerous points in this work, the data attested to the gradient nature of different aspects related to modality and modal categories (cf., in particular, Section 6.5). While gradience as such is not an overly surprising observation, considering that cognitive-functional approaches explicitly build on its pervasiveness on all levels of linguistic representation, it is important to bear in mind that notions such as entrenchment, conventionalization, emancipation, idiomaticity, schematicity or constructionhood are matters of degree. This becomes particularly evident in quantitative diachronic studies and even more so when comparing closely related elements like modal contractions and their respective full forms.

A point of friction remains. Although (D)CxG fully accepts the notion of gradience, the very idea of a *construction* invites a point reading that seems to be at odds with the gradual developments of (lexico-)grammatical phenomena we can observe in historical corpus data (cf. Flach 2020b, 2021). Chapter 4 stated that, while [*can't* V], [*won't* V], and [[SUBJ*'d*] V] represent constructions from a PDE perspective, the data cannot provide a definitive indication at what point of their development any of them became conventionalized or entrenched enough to actually deserve that label. While CxG and its methodological toolbox are invaluable for the study of modal expressions (after all, it provided justification for treating alleged pronunciation variants as emancipated lexical entries), the framework itself is also in part restrictive with its focus on constructions as nodes in a network. Contemporary approaches thus put greater emphasis on the associative links that connect constructions within that network (Diessel 2019; Schmid

2015, 2020). Fortunately, the two approaches are not mutually exclusive; in fact, Hilpert (2018: 33) argues that they can address the same phenomenon, while simply highlighting different aspects of it. Chapter 5 showed how both perspectives can be fruitfully combined.

7.2.3 Constructing a consensus

Which framework is more suitable for investigating changes in the modal domain? Although such a question undoubtedly deserves at least a chapter-length treatment to be adequately addressed, only a couple of points will be alluded to.

Chapters 4–6 showcased the potential of cognitive-functional, usage-based approaches to provide high(er)-resolution descriptions of modal development, but there is no reason to assume that a framework-open approach cannot reach the same level detail. However, the decision to investigate modal expressions at that level of granularity needs to be motivated. In (D)CxG, that motivation comes from at least two sources: (i) the *Principle of No-Synonymy* (Bolinger 1977; Goldberg 1995), according to which a difference in form should entail a difference in (some aspect of) meaning. Functional differences between, for example, *would* and *'d* or *will not* and *won't* should thus be expected.[83] Or (ii) Goldberg's (2002) *surface generalization hypothesis*, which states that each member of an alternating pair is best analyzed on its own terms. The hypothesis predicts that, for example, negative modal contractions will systematically show more similarities between each other than with their corresponding full forms. Speakers are thus assumed to form a common generalization at a higher level of abstraction over the negative modal contractions than over the alternation. Framework-open approaches could of course adopt this functional perspective. Alternatively, they could justify treating modal contractions and full forms separately simply with methodological rigor. Total accountability dictates that each form must be accounted for anyway, but instead of conflating them, the distributional information for each form is kept separate in a data-driven, bottom-up fashion. From a linguistic standpoint, a combination of these approaches seems most sensible.

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[83] As a hard and fast rule, this principle is not really tenable, considering the variation that can be observed in language data (cf. e.g. De Smet et al. 2018; Uhrig 2015). As a tendency, on the other hand, it reminds one to remain cautious about too rashly positing meaning equivalence and common generalizations.

Another point concerns the explanatory factors of language change. The interest of framework-open approaches in discourse-based and macro-sociological explanations is not widely shared by cognitive-functional, usage-based frameworks. Conversely, the importance of cognitive forces in language change has played little role in framework-open research. In DCxG, it is made explicit that some kinds of language change fall outside the scope of what is considered constructional change, namely changes that do not operate on individual but all constructions of a paradigm, or changes initiated from somewhere else in or outside the language system rather than coming from a given construction itself (Hilpert 2013a: 13–16, 205–207). To address changes in the modal domain effectively, it is probably again beneficial to be mindful of each perspective, as both constructional as well as non-constructional changes will be at work. While, for example, colloquialization, as a non-constructional type of change, will play some role in the diffusion of emancipated contracted modal expressions to more formal contexts, it fails to account for changes in the collocational preferences or the functional divergence that was observed and discussed with regard to these contractions and their full forms in Chapters 4–6. Such developments rather support a constructional treatment.

A viable alternative to framework-open approaches and (D)CxG seems to be the EC-Model proposed by Schmid (2015, 2020), which inspired the case study on modal enclitics from Chapter 5. The network-oriented focus of this model, specifically the role of the connective links within that network, helped understand the dynamic changes in the use of modal enclitics relative to their respective full-forms. Beyond that, the model appears to be capable of successfully incorporating language internal and external factors into a unified framework. Thereby, it conforms to both the mentalist and non-mentalist side of language. This becomes possible by clearly differentiating between the processes that affect the knowledge of individual speakers (i.e. entrenchment) and the processes that establish and sustain a communal linguistic system (i.e. conventionalization) on the one hand, but also by acknowledging the connection between these processes through usage on the other. Methodologically, however, it follows that entrenchment and conventionalization must be disentangled empirically. Recent studies have therefore focused on individual speakers (e.g. authors in a corpus context) rather than on aggregated frequency counts over many speakers (e.g. Anthonissen 2019, 2020; Neels 2020; Petré & Van de Velde 2018; Schmid & Mantlik 2015). Undoubtedly, this idiolect approach represents a promising avenue of research that will provide further interesting results in the future, also with regard to changes in the modal domain.

At this point, the reader will have noticed that this section has yet to deliver an answer to the question stated in the beginning. Based on the previous discussions, it would appear that the framework-driven approaches discussed here, especially with the explanatory power they assign to usage intensity and the fact that they, or at least the EC-Model, may also be suited to address changes beyond the level of selected, form–meaning pairings, are the ideal choice for investigating the restructuring of the modal system empirically. However, while their contribution to the present work is undeniable, it should be kept in mind that these approaches are firmly grounded in cognitive-functional, usage-based linguistics. Their commitment to the underlying assumptions or axioms of this framework logically entails some degrees of restrictiveness, which can eventually lead to unwanted biases (cf. Haspelmath 2008). Note that this is not an argument against commitments in general. Quite the contrary, commitments, claims, and predictions are fundamental to the scientific method and need to be made explicit to allow for falsification. But they do not have to be all tied to a single framework. In the end, the goal here was to better understand the intricacies of the English modal system rather than a specific framework. Therefore, the course of action taken in this work was to utilize different strategies and frankenstein the converging results and ideas in order to obtain a more comprehensive view of how the restructuring process in the modal domain has unfolded in AmE since the beginning of the 19th century and how this development can be explained.

7.3   Concluding remarks & outlook

The present work revisited changes in the modal domain in AmE. It was argued that the individual developments of the core modal verbs and selected semi-modals over the course of the 19th and 20th century have been heterogenous in such way that a unified treatment of either category as a whole is conceptually and methodologically highly questionable at best. The lack of any clear uniformity regarding their distributional behavior across time is particularly remarkable in the case of the modal verbs, as it stands in stark contrast to their morphosyntactic coherence. Furthermore, the case studies presented here revealed that even some modal verbs and their institutionalized contracted forms are on different paths in terms of their distribution as well as function, which cast serious doubts on whether lumping them together can be justified. Therefore, the case

was made that, next to formal and functional properties, distributional information (i.e. any aspects related to usage intensity) requires careful consideration and should factor in when it comes to identifying more homogenous sub-categories of modal expressions that may eventually also correspond (more or less) to the mental representations (i.e. constructions or patterns of associations) speakers have abstracted over these forms. But even if the mentalist view is not adopted, being mindful of distributional changes pertaining to modal expressions at different levels of specificity (e.g. CORE MODAL VERBS > CORE MODAL VERBS OF VOLITION/PREDICTION > WILL > *will*, *'ll*, *won't*) is still methodologically warranted if the aggregated data do not summarize individual trends sufficiently. Of course, the same also applies to any other lexical or grammatical phenomenon. In fact, an even more rigorous approach would require disentangling fully compositional uses of a given linguistic pattern and those that are (highly) idiomatized, as they will trigger different symbolic associations (cf. Schmid 2020: 266). Admittedly, such a high-level resolution of the data comes at considerable methodological expenditures, but it will be descriptively more precise and will probably open up new possibilities to uncover and understand patterns in language that may arguably go unnoticed otherwise.

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Appendix

A. Additional figures and tables[84]
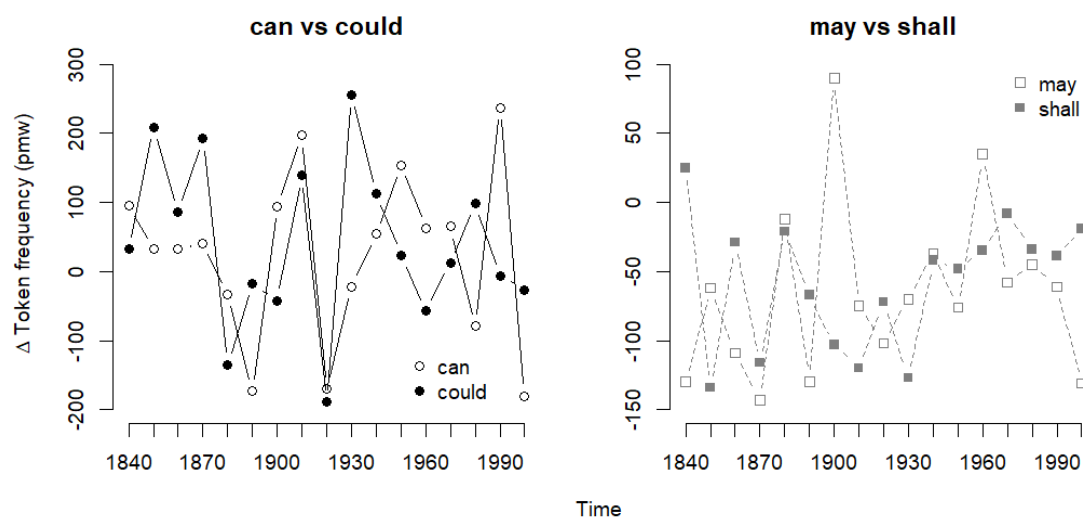
Figure A 1. Peaks and troughs in the developments of *can*, *could*, *may*, and *shall* measured in frequency differences between adjacent periods; values above 0 indicate increases of different degrees, values below 0 indicate decreases
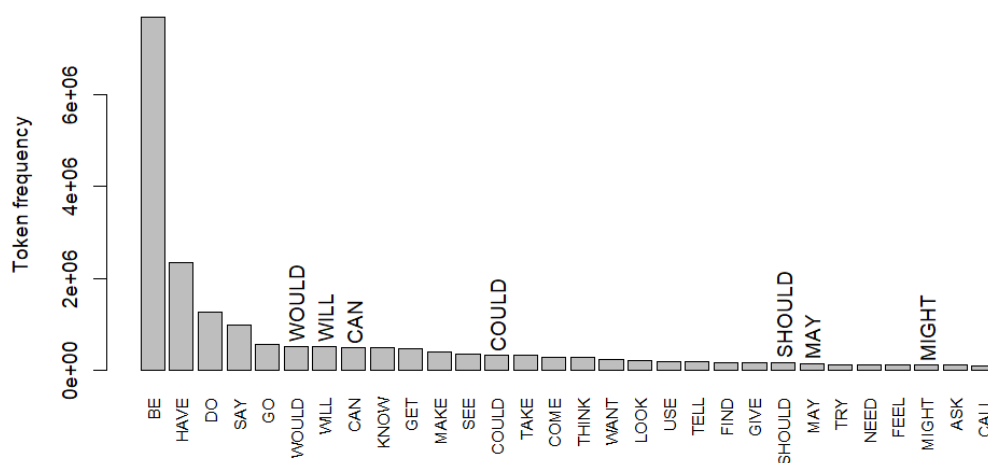
Figure A 2. Rankings of modal verbs among the 30 most frequent verb lemmas in contemporary American English; COCA (2010–2019; SPOK, FIC, MAG, NEWS, ACAD)

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[84] Note: All frequencies listed in Tables A2–A13 are normalized (pmw) and rounded to the next whole number. Percentage changes are based on frequencies (pmw). The level of significance for a given change is marked according to Table A1 below. Changes that are non-significant are left blank. For the sake of clarity, exact LL-values (G^2) are provided for long-term changes only. In any case, the G^2 based on raw frequencies and the respective (sub-)corpus sizes.

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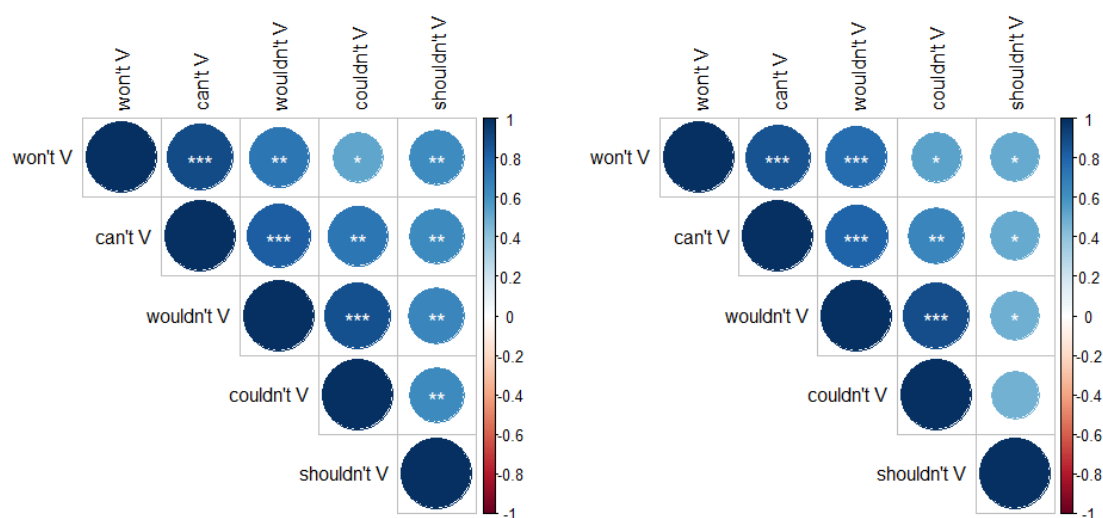
Figure A 3. Correlation matrices for decadal changes in the usage frequency of selected negative modal contractions in COHA; Δtoken frequency (pmw) (left), Δrelative frequency (right); correlations are assessed using Pearson's *r*

Table A 1. Levels of statistical significance, log-likelihood ratio test (*G²*)

	p-values			
	p<.05	*p*<.01	*p*<.001	*p*<.0001
level	5%	1%	.1%	.01%
percentile	95th	99th	99.9th	99.99th
G²: critical value	3.84	6.63	10.83	15.13
in-text marking	*	**	***	****

Table A 2. Frequency distribution of modals in COHA from the 1830s to the 1890s

	1830s	1840s	1850s	1860s	1870s	1880s	1890s	*G²*	Δ% (1830s – 1890s)
would	2,594	****2,493	****2,773	**2,823	****3,080	***3,019	****2,820	156.53	8.7
will	2,882	2,854	****2,959	**3,009	***2,941	****3,011	****2,828	8.51	-1.9
can	1,762	****1,858	*1,890	*1,922	**1,963	*1,930	****1,757	.14	-.3
could	1,374	*1,407	****1,616	****1,702	****1,894	****1,759	1,741	716.51	26.7
should	1,456	****1,357	1,382	****1,291	1,296	****1,240	****1,137	664.32	-21.9
might	813	***775	****823	812	794	****724	****686	180.51	-15.6
may	1,632	****1,502	****1,440	****1,331	****1,188	1,176	****1,046	2193.19	-35.9
must	1,138	****1,193	1,194	1,203	1,220	****1,146	****1,047	63.43	-8.0
shall	1,042	*1,067	****933	**904	****788	*767	****700	1142.22	-32.8
Total	14,695	14,507	15,009	14,997	15,164	14,771	13,763	510.91	-6.3
Δ%		****-1.3	****3.5	-.1	****1.1	****-2.6	****-6.8		

Table A 3. Frequency distribution of modals in COHA from the 1900s to the 2000s

	1900s	1910s	1920s	1930s	1940s	1950s
would	****2,923	****3,250	****3,126	****3,393	****3,524	3,539
will	****3,120	****3,401	3,425	****3,169	***3,107	3,086
can	****1,851	****2,048	****1,878	1,856	****1,910	****2,064
could	***1,699	****1,838	****1,649	****1,904	****2,017	2,040
should	****1,051	1,034	****935	****882	****813	798
might	*707	*725	712	703	**683	684
may	****1,136	****1,061	****959	****889	****852	****776
must	****1,106	****1,167	****967	****933	**909	****845
shall	****597	****477	****405	****278	****236	****188
Total	**14,189**	**15,002**	**14,055**	**14,005**	**14,050**	**14,021**
Δ%	****3.10	****5.73	****-6.31	-0.36	0.32	-0.2

cont'd

	1960s	1970s	1980s	1990s	2000s	G²	Δ% (1900s–2000s)
would	****3,443	3,441	****3,286	****3,176	****3,103	137.1	6.2
will	****2,960	2,939	****2,686	2,681	****2,443	2118.41	-21.7
can	****2,127	****2,192	****2,113	****2,350	****2,170	644.71	17.2
could	****1,983	1,995	****2,093	2,087	****2,060	883.61	21.3
should	***767	775	****672	***698	****649	2468.7	-38.2
might	**664	668	****628	****582	593	256.62	-16.1
may	****811	****753	****708	****647	****516	6195.21	-54.6
must	****804	****739	****622	****520	****399	9027.12	-63.9
shall	****153	*145	****111	****72	****53	14210.58	-91.1
Total	**13,711**	**13,647**	**12,918**	**12,813**	**11,987**	**4756.54**	**-15.5**
Δ%	****-2.2	-0.5	****-5.3	***-0.8	****-6.4		

Table A 4. The overall development of modals in COHA

	1830s	2000s	G²	Δ%
would	2,594	3,103	844.11	19.6
will	2,882	2,443	686.95	-15.2
can	1,762	2,170	786.20	23.2
could	1,374	2,060	2525.31	49.9
should	1,456	649	6254.85	-55.4
might	813	593	663.50	-27.1
may	1,632	516	12262.28	-68.4
must	1,138	399	7420.24	-65.0
shall	1,042	53	23780.47	-94.9
Total	**14,695**	**11,987**	**5232.21**	**-18.4**

Table A 5. The overall modal development of modals across different registers in COHA, 1860s–2000s

	Time	FICTION	MAGAZINES	NEWS	NON-FICTION
	1860s	15,780	14,697	16,068	12,865
	1870s	****16,088	14,663	**16,883	****11,973
	1880s	****16,472	****14,162	****16,147	****10,005
	1890s	****15,822	****13,415	****15,490	****7,659
	1900s	*15,931	**13,175	****12,855	****10,728
	1910s	15,860	****13,826	****15,764	****13,677
	1920s	****15,400	****12,639	****14,584	****11,227
	1930s	****14,853	**12,466	14,570	****13,038
	1940s	****15,061	12,516	14,648	****12,246
	1950s	****15,498	****11,586	****14,247	****12,607
	1960s	****14,818	****11,320	****13,405	****14,378
	1970s	****15,035	11,373	****12,918	****13,456
	1980s	****14,747	***11,157	****10,673	****12,028
	1990s	****14,020	****11,865	****11,116	12,143
	2000s	****13,030	****11,372	****10,734	****10,265
	G^2	3034.61	2419.24	560.63	892.57
Δ% (1860s–2000s)		-17.4	-22.6	-33.2	-20.2

Table A 6. Individual modal developments in non-fiction books (NON-FICTION), COHA, 1860s–1920s

	1860s	1870s	1880s	1890s	1900s	1910s	1920s	G^2	Δ% (1860s–1920s)
would	2,162	**2,290	****1,762	****1,402	****1,535	****2,255	****1,934	42.07	-10.6
will	2,366	****1,911	****1,644	****1,131	****1,925	****2,568	****1,761	294.84	-25.6
can	1,648	1,675	****1,431	****1,002	****1,593	****2,098	****1,659	.12	.7
could	1,160	****1,480	****992	****889	****747	****1,129	****1,009	35.09	-13.1
should	1,315	****1,073	****901	****783	****1,053	****1,419	****1,128	47.44	-14.2
might	646	*599	****501	****417	*451	****529	513	50.39	-20.5
may	1,713	****1,348	*1,288	****991	****1,816	1,810	1,811	8.89	5.7
must	1,043	1,085	****924	****657	****1,027	****1,340	****1,090	3.47	4.5
shall	811	****512	**561	****387	****581	**531	****322	730.52	-60.2
Total	**12,865**	**11,973**	**10,005**	**7,659**	**10,728**	**13,677**	**11,227**	**368.20**	**-12.7**
Δ%		****-6.9	****-16.4	****-23.5	****40.1	****27.5	****-17.9		

Table A 7. Frequency distribution of semi-modals in COHA from the 1830s to the 1890s

	1830s	1840s	1850s	1860s	1870s	1880s	1890s	G²	Δ% (1810s – 1890s)
HAVE *to*	104	****120	****150	****189	****265	****293	****323	1904.17	211.6
WANT *to*/*wanna*	60	***70	****112	****159	****213	*225	218	1537.72	265.3
BE *going to*/*gonna*	42	40	****76	****120	****135	****156	161	1199.74	285.2
NEED *to*	10	**13	****25	25	****35	*31	33	206.93	230.9
BE *able to*	106	*98	****126	**115	****130	134	***146	106.43	38.0
(HAVE) *got to*/*gotta*	9	9	***12	****26	25	***31	***37	293.11	313.4
BE *supposed to*	34	32	30	28	28	28	30	3.16	-10.3
BE *allowed to*	28	*33	34	34	37	39	37	19.89	31.4
BE *to*	47	49	50	51	54	*48	47	.07	-1.4
Total	**439**	**464**	**617**	**745**	**923**	**985**	**1,032**	**3987.73**	**135.0**
Δ%		**5.6	****33.0	****20.9	****23.8	****6.7	****4.8		

Table A 8. Frequency distribution of semi-modals in COHA from the 1900s to the 2000s

	1900s	1910s	1920s	1930s	1940s	1950s
HAVE *to*	****392	****503	*490	****640	****735	****798
WANT *to* / *wanna*	****305	****418	410	****495	****557	****603
BE *going to* / *gonna*	****246	****368	****343	350	****374	374
NEED *to*	***39	*43	**39	****47	****59	63
BE *able to*	142	****169	163	165	****185	184
(HAVE) *got to* / *gotta*	****64	****109	109	****133	132	**123
BE *supposed to*	29	29	28	****40	**45	***52
BE *allowed to*	36	38	**33	32	31	32
BE *to*	44	**51	****42	***35	**31	30
Total	**1,299**	**1,729**	**1,658**	**1,939**	**2,150**	**2,259**
Δ%	****25.9	****33.1	****-4.1	****16.9	****10.9	****5.1

cont'd

	1960s	1970s	1980s	1990s	2000s	G²	Δ% (1900s– 2000s)
HAVE *to*	808	***836	838	***869	****838	4151.48	113.6
WANT *to* / *wanna*	****652	****705	708	****810	**787	5508.61	157.8
BE *going to* / *gonna*	****403	****457	****404	****504	502	2249.93	104.1
NEED *to*	****73	****86	****121	****218	****279	609.64	609.6
BE *able to*	188	190	189	186	184	132	28.9
(HAVE) *got to* / *gotta*	120	119	**110	109	*102	226.6	60.1
BE *supposed to*	**59	****70	*75	***84	***94	875.27	217.5
BE *allowed to*	32	****39	***33	*30	27	31.7	-24.4
BE *to*	**25	27	****20	****15	**12	508.05	-72.4
Total	**2,360**	**2,529**	**2,499**	**2,825**	**2,825**	**14526.89**	**117.4**
Δ%	****4.5	****7.2	*-1.2	****13.0	-0.0		

Table A 9. The overall development of semi-modals in COHA

	1830s	2000s	*G²*	Δ%
HAVE *to*	104	838	11127.41	708.5
WANT *to/wanna*	60	787	12502.70	1218.5
BE going *to/gonna*	42	502	7746.18	1098.2
NEED *to*	10	279	5232.98	2728.2
BE able *to*	106	184	383.30	73.3
(HAVE) *got to/gotta*	9	102	1558.10	1046.8
BE *supposed to*	34	94	516.96	176.4
BE *allowed to*	28	27	.16	-2.5
BE *to*	47	12	449.43	-74.1
Total	**439**	**2,825**	**33441.27**	**543.1**

Table A 10. Recent frequency shifts of modals in spoken AmE (COCA), 1990 to 2012

	1990-94	1995-99	2000-04	2005-09	2010-12	*G²*	Δ% (1990–2012)
will	4,100	****3,816	****3,658	****3,271	****3,526	607.41	-14.0
can	3,066	****3,203	****2,875	****3,017	****3,436	301.63	12.1
would	3,638	****3,545	****3,030	****2,884	****3,215	368.04	-11.6
could	1,398	****1,444	1,446	1,442	****1,541	99.55	10.2
should	1,012	1,006	****864	***833	****937	40.80	-7.4
may	758	****656	****696	****609	**582	321.78	-23.2
might	469	474	****505	****463	454	3.48	-3.2
must	311	****240	**226	****166	159	690.42	-49.0
shall	24	25	23	**19	**24	0.09	-2.2
Total	**14,775**	**14,410**	**13,321**	**12,705**	**13,873**	**401.33**	**-6.1**
Δ%		****-2.5	****-7.6	****-4.6	****9.2		

Table A 11. Recent frequency shifts of semi-modals in spoken AmE (COCA), 1990 to 2012

	1990-94	1995-99	2000-04	2005-09	2010-12	*G²*	Δ% (1990–2012)
BE *going to/gonna*	2,384	****2,458	****1,997	****2,396	****2,870	645.89	20.4
WANT *to/wanna*	1,443	****1,635	****1,382	****1,570	****1,844	707.93	27.8
HAVE *to*	1,572	1,561	****1,379	****1,421	****1,631	15.33	3.7
NEED *to*	320	****382	*397	****459	****571	1050.07	78.3
(HAVE) *got to/gotta*	324	330	****254	****339	****409	141.40	26.3
BE *able to*	343	343	****375	*361	****401	63.07	16.7
BE *supposed to*	99	*106	****93	95	****113	14.40	14.8
BE *allowed to*	48	**42	40	*35	*41	7.04	-14.0
BE *to*	13	11	11	9	10	5.20	-22.4
Total	**6,546**	**6,869**	**5,926**	**6,686**	**7,890**	**1797.89**	**20.5**
Δ%		****4.9	****-13.7	****12.8	****18.0		

Table A 12. Recent frequency shifts of modals in COCA (written registers), 1990 to 2012

	1990-94	1995-99	2000-04	2005-09	2010-12	G^2	Δ% (1990–2012)
would	2,607	****2,533	****2,480	*2,498	2,513	92.91	-3.6
can	2,257	****2,386	*2,404	****2,367	**2,341	83.51	3.7
will	2,558	****2,499	****2,447	****2,340	****2,297	761.99	-10.2
could	1,566	****1,509	*1,524	****1,554	****1,614	39.77	3.1
should	738	742	****710	**697	704	44.00	-4.6
may	867	****835	****810	****781	****720	742.85	-17.0
might	513	508	****528	****546	**533	19.97	3.8
must	551	****476	****444	****396	****371	1895.48	-32.7
shall	52	****46	****37	****33	****26	477.93	-50.4
Total	**11,708**	**11,535**	**11,384**	**11,212**	**11,118**	**834.06**	**-5.0**
Δ%		****-1.5	****-1.3	****-1.5	****-0.8		

Table A 13. Recent frequency shifts of semi-modals in COCA (written registers), 1990 to 2012

	1990-94	1995-99	2000-04	2005-09	2010-12	G^2	Δ% (1990–2012)
HAVE *to*	710	**722	****704	*694	**681	33.25	-4.1
WANT *to*/*wanna*	581	****641	643	639	*627	98.44	8.0
BE going *to*/*gonna*	355	****382	377	****392	****373	25.12	5.1
NEED *to*	214	****252	****284	****327	****343	1690.25	60.2
BE able *to*	198	197	**204	206	209	18.82	6.0
BE supposed *to*	58	**61	****66	*63	*60	2.47	4.0
(HAVE) *got to*/*gotta*	76	79	*75	****69	****59	111.56	-22.0
BE *allowed to*	34	**31	**28	*26	27	38.90	-19.6
BE *to*	16	**15	***13	**11	*10	91.12	-40.5
Total	**2,240**	**2,378**	**2,394**	**2,428**	**2,389**	**262.06**	**6.6**
Δ%		****6.2	*0.7	****1.5	****-1.6		

B. Errata

p. 45   The data in Table 3.1 do not show the actual log-likelihood (LL or G^2) values but only the percentages along with the levels of significance, which were determined based on a log-likelihood ratio test.

p. 47   The final data point for the group of lower frequency modals in Figure 3.1 (2000s, grey curve) in the original publication is erroneous and the result of a data transmission error. The frequency is actually 2,263 rather than 1,858 tokens (pmw), which means the overall decline amounts to 52.0% rather than 60.6%.

pp. 212–213   Tables A10–A13 list "Change(%) per decade" to describe the percentage changes from one data point to the next in the original publication. This is a labeling error — the data clearly show the percentage changes for every five-year interval.

C. Deutsche Zusammenfassung

Die vorliegende Arbeit stellt eine umfassende, empirische Abhandlung zur historischen Entwicklung von Modalverben (z.B. *must*, *can*) und Halbmodalen (z.B. HAVE *to*, BE *going to*) im amerikanischen Englisch des 19. und 20. Jahrhunderts dar. Mittels verschiedener theoretischer und methodischer Ansätze wird gezeigt, dass sich das Modalsystem im amerikanischen Englisch schon seit längerem in einer äußerst heterogenen Restrukturierungsphase befindet, die die Vermutung nahelegt, dass es sich bei den beobachteten Veränderungen um selektive Konstruktionswandelprozesse im Sinne der diachronen Konstruktionsgrammatik (Hilpert 2013a, 2016a) handelt. Von besonderem Interesse ist hier die Kategorie der Modalverben. Die äußerst dynamischen und komplexen, individuellen diachronen Entwicklungen der einzelnen Mitglieder dieser Kategorie stehen im starken Kontrast zu derer morphosyntaktischen Kohärenz und funktionalen Überlappungen. Die Datenlage deutet demnach darauf hin, dass eine Betrachtung dieser Kategorie als ein klar abgegrenztes, einheitliches Ganzes empirisch höchst fragwürdig ist. Frühere Studien (z.B. Leech 2003, 2011; Leech et al. 2009) verweisen auf einen allgemeinen Rückgang im Gebrauch der Modalverben im Englisch des 20. Jahrhunderts hin. Dem gegenüber steht ein starker Anstieg im Gebrauch von (einigen) Halbmodalen. Die Annahme über derart globale Trends resultiert aus aggregierten Korpusfrequenzen der jeweiligen Mitglieder einer Kategorie. Bei näherer Betrachtung der intrakategorischen Entwicklungen zeigt sich jedoch, dass die jeweiligen Frequenzveränderungen der einzelnen Modalverben und Halbmodale nicht flächendeckend gleichgerichtet sind, d.h. gegen den globalen Trend der jeweiligen Kategorie laufen. Diese Beobachtung erhärtet sich zum einen, wenn der Zeitraum der diachronen Entwicklungen auf das 19. Jahrhundert ausgeweitet wird, und zum anderen, wenn verschiedene morphosyntaktische Konfigurationen, wie kontrahierte Formen (z.B. *would > 'd*, *will not > won't*) oder (SUBJEKT +) MODALVERB + INFINITIV Sequenzen (z.B. SUBJ*'ll* V, *can* V) explizit in Betracht gezogen werden. Aus ‚traditioneller' Sicht ist eine detaillierte Analyse dieser Art eher unüblich, da keine Bedeutungsunterschiede zwischen kontrahierten und nichtkontrahierten Formen postuliert und somit die jeweiligen Oberflächenstrukturen unter einer gemeinsamen abstrakten Form zusammengefasst werden. Ebenso spielen Kollokationspräferenzen (d.h. mit welchen Subjekten und Infinitiven ein Modalausdruck häufiger vorkommt als per Zufall erwartet werden kann) eine untergeordnete Rolle, sofern sie überhaupt Erwähnung finden. Mit Hilfe kognitiv-

funktionaler, gebrauchsbasierter Ansätze zeigt die vorliegende Studie allerdings, dass sich einige kontrahierte Modalverben, insbesondere die Klitika *'d* und *'ll*, sowie die Negativkontraktionen *can't* und *won't*, bezüglich ihrer formalen Eigenschaften, Distribution (d.h. verschiedene Aspekte ihrer Verwendungsfrequenz) und Bedeutung von ihren nicht-kontrahierten Formen emanzipiert haben und als eigenständige Konstruktionen, d.h. entrenchte Form–Bedeutungspaare im konstruktionsgrammatischen Sinne (Goldberg 1995, 2006), angesehen werden können. Unter dieser Prämisse ist eine separate Untersuchung ihrer jeweiligen Entwicklung sowohl konzeptuell als auch methodisch motiviert. Diese trägt signifikant zu dem Ergebnis bei, dass der Restrukturierungsprozess im Modalsystem des amerikanischen Englisch nicht die zu untersuchenden Kategorien als Ganzes betrifft, sondern sich eher auf der Ebene individueller Konstruktionen vollzieht. Die Datengrundlage für die Untersuchungen bilden zwei Megakorpora des amerikanischen Englisch, nämlich das *Corpus of Historical American English* (COHA; Davies 2010; 1810–2009; 400 Mio. Wörter) und das *Corpus of Contemporary American English* (COCA; Davies 2008– ; 1990–2019; 1 Mrd. Wörter). Methodisch greift diese Studie vielfach auf datengesteuerte Analysen zurück und ist demnach als eher empirisch-quantitativ einzuordnen. Durch die Verwendung verschiedener, konvergierender Ansätze und Methoden wird ein hoher Grad an deskriptiver Genauigkeit erreicht und es werden neue Erklärungsansätze zu den Veränderungen im Modalsystem geliefert und diskutiert, was einen Mehrwert darstellt, der sich sowohl auf theoretischer als auch auf methodischer und empirischer Ebene zeigt. Vom Aufbau her gliedert sich die vorliegende Arbeit in vier Fallstudien zu verschiedenen Modalverben und Halbmodalen. Ein Rahmentext setzt die einzelnen Studien in Beziehung zueinander, diskutiert deren Beträge und gibt einen Ausblick auf zukünftige Forschungsfragen. Die einzelnen Kapitel werden im Folgenden zusammengefasst.

Kapitel 1, *Introduction*, wirft zunächst die Frage auf, inwieweit Veränderungen im Modalsystem, insbesondere die Modalverben betreffend, auf der Ebene der Kategorie als einheitliches Ganzes diskutiert werden sollten, wenn die individuellen Entwicklungen einzelner Modalverben unter Umständen in keinem theoretisch-konzeptionellen Zusammenhang stehen und die Veränderungen in den Verwendungsfrequenzen statistisch nicht korrelieren. Es wird gemutmaßt, dass die intrakategorischen Veränderungen heterogen und unabhängig voneinander sind, sodass aggregierte Verwendungsfrequenzen zwar einen Trend (wie beispielsweise den oft proklamierten Rückgang im Gebrauch der Modalverben) vermuten lassen, dieser allerdings nicht allen Modalverben gleichermaßen

gerecht wird und daher das Hauptaugenmerk bei deren Untersuchung auf individuellen Entwicklungen liegen sollte, um den Restrukturierungsprozess genauer zu beschreiben. Ferner wird der Vorschlag unterbreitet, dass dies am besten dadurch erreicht wird, wenn verschiedene theoretische und methodische Ansätze miteinander gekoppelt werden, insbesondere korpuslinguistische und gebrauchsbasierte Ansätze. Vier miteinander in Bezug auf die Restrukturierung des Modalsystems im amerikanischen Englisch verwobene Hypothesen stellen den Kern des Kapitels dar.

Hypothese 1: Bei den Veränderungen im Modalsystem handelt es sich in erster Linie um Konstruktionswandelprozesse. Als besondere Form des Sprachwandels kommt Konstruktionswandel selektiv bei einzelnen Form–Bedeutungspaaren zur Geltung und verändert diese entweder in deren formalen, semantischen, pragmatischen und/oder distributionalen Eigenschaften (Hilpert 2013a). Die Tatsache, dass die Veränderungen innerhalb der Kategorien nicht flächendeckend gleichgerichtet sind, lässt darauf schließen, dass ein einzelner Prozess, dem die jeweiligen Kategorien als Ganzes unterliegen, unwahrscheinlich ist. Die Unterschiede manifestieren sich auf verschiedenen Ebenen der linguistischen Beschreibung und scheinen sich am ehesten durch den Gebrauch der jeweiligen Modalverben erklären zu lassen, was verschiedene Konstruktionswandelprozesse nahelegt.

Hypothese 2: Neben formalen und funktionalen Eigenschaften, geben die (relativen) Verwendungsfrequenzen und Gebrauchsprofile von Modalausdrücken zusätzliche Indizien für deren Zugehörigkeit zu bzw. Ausschluss von einer Kategorie. Insbesondere die Modalverben stellen aufgrund ihrer morphosyntaktischen Kohärenz und ihrer funktionalen Überlappung eine scheinbar klar abgegrenzte, uniforme Kategorie dar. Relativiert wird diese Beobachtung, sobald (relative) Verwendungsfrequenzen und/oder Gebrauchsprofile (z.B. Kollokationspräferenzen) in Betracht gezogen werden. Sobald sich divergierende Trends in den Verwendungsfrequenzen und/oder Gebrauchsprofilen verschiedener Modalausdrücken feststellen lassen, sollten diese sowohl aus methodischer als auch aus theoretisch-konzeptioneller Sicht nicht aggregiert werden, da Sprecher:innen die betroffenen Formen womöglich als zu unterschiedlich wahrnehmen.

Hypothese 3: Paradigmatische Konkurrenz ist bei Modalausdrücken sowohl interkategorisch als auch intrakategorisch bis hin zur Alternation zwischen kontrahierten und nichtkontrahierten Formen zu beobachten. Die onomasiologische bzw. paradigmatische Konkurrenz zwischen Modalverben und Halbmodalen (z.B. *must* vs. HAVE *to*) ist in der Literatur vielfach diskutiert worden. Ebenso findet diese auf

intrakategorialer Ebene statt (z.B. *can* vs. *may*, HAVE *to* vs. NEED *to*). Darüber hinaus konkurrieren auch kontrahierte und nichtkontrahierte Formen miteinander (z.B. *cannot* vs. *can't*, *would* vs. *'d*). Aufgrund der Annahme, dass einige kontrahierte Formen sich von ihren jeweiligen nichtkontrahierten auf mehreren Ebenen emanzipiert haben, ist diese Konkurrenz nicht allein auf Aussprache oder Register zurückzuführen, sondern auf genuine Unterschiede in deren jeweiligen Bedeutungen.

Hypothese 4: Bei der Untersuchung der Veränderungen im Modalsystem kommt die Distributionshypothese besonders zum Tragen. Diachrone Daten sind für Sprachintuition in der Regel unzugänglich und setzen daher den Einsatz von empirischen, korpusbasierten Forschungsmethoden voraus. Überdies lassen sich mit Hilfe quantitativer Daten semantische Strukturen ableiten, die auf probabilistischen Faktoren basieren. Dies ist insbesondere bei dem Vergleich von kontrahierten und nichtkontrahierten Modalverben hilfreich, da deren Bedeutungsunterschiede oft unauffällig sind und erst durch deren Distribution verdeutlicht werden können. Ausgehend von der Annahme, dass Sprachwissen von Sprecher:innen probabilistisch und gebrauchsbasiert ist, kann man sich diesem Wissen mit Hilfe von Sprachdaten und frequenzbasierten Methoden annähern.

Kapitel 2, *The frameworks*, befasst sich, neben den morphosyntaktischen und funktionalen Eigenschaften von Modalverben und Halbmodalen, mit dem aktuellen Forschungsstand zu den Veränderungen im Modalsystem des amerikanischen Englisch und bezieht sich dabei besonders auf korpusbasierte, variationslinguistische Studien um das Thema. Es wird der Vorschlag unterbreitet, dass diese Studien sich in zwei Lager unterteilen lassen. Das erste Lager (*framework-open approaches*), was deutlich mehr Studien umfasst, zeichnet sich dadurch aus, dass keine expliziten, grammatisch-theoretischen Annahmen getroffen werden, d.h. die theoretischen Grundlagen dieser Studien lassen sich weder rein strukturalistischen noch formalistischen oder kognitive-funktionalen Sprachtheorien eindeutig zuordnen. Diese Studien bleiben diesbezüglich hier weitestgehend agnostisch, nehmen aber bei Bedarf Bezug auf verschiedene Aspekte der unterschiedlichen Theorien. Das andere Lager (*framework-driven approaches*) hingegen zeichnet sich dadurch aus, dass die wenigen Studien, die sich hier zuordnen lassen, sich explizit kognitive-funktionalen Ansätzen verschreiben. Die jeweiligen konzeptuellen und methodischen Konsequenzen, die sich aus den Ansichten der jeweiligen Lager ergeben, werden gegenübergestellt und bewertet. Als Ergebnis wird festgehalten, dass Studien mit einer framework-open Neigung, wichtige, erste Hinweise für die Entwicklung von Modalverben und Halbmodalen liefern können, in der Regel

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aber Gefahr laufen, unter anderem aufgrund ihrer methodischen Prämissen (insb. *Total accountability*), die zum Teil gegenläufigen Veränderungen in der Distribution der jeweiligen Oberflächenstrukturen (d.h. z.B. kontrahierte und nichtkontrahierte Formen) nicht voneinander zu trennen. Die framework-driven Studien hingegen sind aufgrund ihrer kognitive-funktionalen, gebrauchsbasierten Ausrichtung sensible(r) für Unterschiede in den Verwendungsfrequenzen der Oberflächenstrukturen, da hier auch funktionale Unterschiede vermutet und oft bestätigt werden.

Der zweite größere Abschnitt des Kapitels geht näher auf die gebrauchsbasierten Modelle der Konstruktionsgrammatik (KxG; Goldberg 2006), Netzwerkmodelle, wie das *Entrenchment-and-Conventionalization Model* (EC-Modell) von Schmid (2015, 2020), und Konstruktionswandel (Hilpert 2013a) ein und beschreibt, wie Modalausdrücke in diesen Modellen eine Rolle spielen. Zunächst wird die Frage nach einer Modalkonstruktion gestellt. Zwar sind Modalverben aufgrund ihres ohnehin symbolischen Charakters als Wörter Konstruktionen per Definition, werden aber in der vorliegenden Studie, wie auch bei Hilpert (2016a), als Pivotelement eines dynamischen, teilabstrakten Schemas definiert, das auch den folgenden Verbinfinitiv und gegebenenfalls das vorangehende Subjekt als abstrakte Slots berücksichtigt (z.B. [*will* V], [*can* V], [[SUBJ*'d*] V]). Damit wird verdeutlicht, dass Modalverben, wie auch Halbmodale, starke syntagmatische Verbindungen mit ihrem Kotext, insbesondere den folgenden Verbinfinitiven, aufzeigen. Durch diese Annahme lassen sich die Bedeutungen von Modalkonstruktionen unter anderem auch auf Kollokationspräferenzen zurückführen, nach denen bestimmte Modalausdrücke verschiedene Verben oder Verbcluster mehr bevorzugen als andere. Diese Präferenzen gehören zum probabilistischen Sprachwissen von Sprecher:innen, sind aber nicht mit Hilfe von anderem, bereits vorhandenen Sprachwissen vorhersagbar, was die jeweiligen Sequenzen zu Konstruktionen macht. Die syntagmatischen Assoziationen spielen auch eine große Rolle im EC-Modell. Anders als bei der KxG, liegt der Schwerpunkt allerdings nicht auf Konstruktionen als Knoten in einem assoziativen Netzwerk, sondern auf den Verbindungen in diesem Netzwerk selbst. Das EC-Modell ist schlanker als die KxG und scheint besonders gut geeignet zu sein, die dynamischen Aspekte von Sprache, insbesondere Variation und Wandel zu erklären. Das Konstruktionswandelbegriff ist kompatibel mit beiden Ansätzen und in Bezug auf die Veränderungen im Modalsystem hervorragend anwendbar.

Der letzte Teil des Kapitels beschäftigt sich mit dem Zusammenhang von Korpusdaten und Kognition. Entrenchment und Konventionalisierung, sowie deren Operationalisierung mittels verschiedener Verwendungsfrequenzen, werden erörtert.

Kapitel 3, *On the development of modals and semi-modals in American English in the 19th and 20th centuries*, repliziert zunächst die Ergebnisse früherer Studien zum Wandel und der Variation von Modalverben und Halbmodalen im amerikanischen Englisch des 20. Jahrhunderts (z.B. Leech 2003, 2011; Leech et al. 2009; Millar 2009) und erweitert diese mit neuen Ergebnissen für das 19. Jahrhundert. Dabei liegt der Fokus insbesondere auf den individuellen Verwendungsfrequenzen der prototypischen Modalverben *will*, *would*, *can*, *could*, *may*, *might*, *shall*, *should* und *must*, sowie einer Auswahl von Halbmodalen, die HAVE *to*, BE *going to*, WANT *to*, NEED *to*, (HAVE) *got to*, BE *able to*, BE *supposed to*, BE *allowed to* and BE *to* behinhaltet. Die Korpusdaten belegen zwar, dass der vermeintliche Rückgang in der Verwendungsfrequenz der Modalverben als Gruppe für die zweite Hälfte des 20. Jahrhunderts eindeutig scheint, hier allerdings einzelne Modalverben (z.B. *can* und *could*) signifikante Anstiege verzeichnen, was die Gesamtbetrachtung relativiert. Werden die Ergebnisse für das 19. Jahrhundert hinzugezogen, zeigt sich, dass die Entwicklung weitaus stärker fluktuieren. Als eine der wichtigsten Erkenntnisse kann diese Fallstudie das oft rezipierte *bottom-weighting of the frequency loss* (Leech 2003, 2011), wonach hochfrequente Modalverben (*will*, *would*, *can*, *could*) Stabilität in ihrer Verwendungsfrequenz aufweisen und niederfrequente Modalverben (z.B. *may*, *shall*, *must*) weiter marginalisiert werden, widerlegen. Es wird gezeigt, dass die Gruppe der hochfrequenten Modalverben historisch extrem inhomogen ist und das insbesondere *will* einen starken Rückgang in der Verwendungsfrequenz verzeichnet, wohingegen *would* relativ stabil bleibt und *can* und *could* in ihrem Gebrauch ansteigen. Die Betrachtung dieser vier Modalverben als Gruppe ist daher aus historischer Sicht nicht haltbar. Besonders der Rückgang im Gebrauch von *will* ist in früheren Studien kaum diskutiert worden und führt unter anderem in dieser Fallstudie dazu, auch die Halbmodale, als potentielle Kompetitoren, ebenfalls auf deren diachrone Frequenzentwicklung zu untersuchen. Intrakategorisch verhalten sich auch die Halbmodale sehr heterogen bezüglich ihrer Verwendungsfrequenz. Die größten Anstiege verzeichnen HAVE *to*, BE *going to*, WANT *to* und NEED *to*, was auf deren fortgeschrittenen Grammatikalisierungsgrad zurückzuführen ist. Aber anders als bei HAVE *to*, welches am Ende des 20. Jahrhunderts sogar häufiger vorkommt als sein onomasiologischer Kompetitor *must*, werden die anderen Halmodale im Vergleich zu den Modalverben

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seltener verwendet. Dieser Umstand ist besonders interessant in Bezug auf *will*, welches nach *must* den stärksten Rückgang verzeichnet, aber von BE *going to* und WANT *to* lediglich im gesprochenen English ernstzunehmende Konkurrenz bekommt.

Kapitel 4, *Contractions, constructions and constructional change: Investigating the constructionhood of English modal contractions from a diachronic perspective*, untersucht, explizit ausgehend von einer gebrauchsbasierten, konstruktionsgrammatischen Perspektive, den Status der Negativkontraktionen *can't*, *won't* und dem Klitikon *'d* als Konstruktionen. Es wird zunächst auf theoretischer Ebene argumentiert, dass keine dieser kontrahierten Formen mittels irgendeiner bestehenden morphologischen oder morphophonlogischen Regel von ihren jeweiligen nichtkontrahierten Formen abgleitet werden kann und daher separat als (Teile von) Konstruktionen abgespeichert sein muss. Gemäß des Modalkonstruktionsbegriff ergeben sich daraus drei bisher noch nicht untersuchte Konstruktionen: [*can't* V], [*won't* V] und [[SUBJ*'d*] V]. Empirisch zeigt sich, dass diese Konstruktionen signifikante Anstiege in ihren Verwendungsfrequenzen im amerikanischen English seit Beginn des 19. Jahrhunderts aufweisen, sowohl absolut gesehen als auch in Relation zu ihren nichtkontrahierten Formen. Mit Hilfe von distinktiven Kollostruktionsanalysen (Gries & Stefanowitsch 2004) macht die Studie deutlich, dass sich die Kollokationspräferenzen von kontrahierten und nichtkontrahierten Formen signifikant unterscheiden und sich über die Zeit verändern, was als eine erste Approximation für Bedeutungsunterschiede und auch Bedeutungswandel angesehen werden kann. Basierend auf den distinktiven Kollexemen wurde ein Subkorpus aus Zufallsstichproben erstellt, mit Hilfe dessen 4800 realsprachliche Beispiele auf verschiedene Variablen annotiert und mittels generalisierter linearer gemischter Regressionsmodelle analysiert wurden. Die Ergebnisse der Regressionsanalysen zeigen relative funktionale Unterschiede zwischen den kontrahierten und nicht kontrahierten Formen und liefern dadurch weitere Belege für den Konstruktionsstatus der Kontraktionen. Anschließend diskutiert die Fallstudie die Ergebnisse im Kontext des Konstruktionswandels und kommt zu dem Schluss, dass die jeweiligen Kontraktionen sich zwar in ihren Entwicklungen ähneln, aber auch Unterschiede aufweisen, was die Andendung des Begriffs des Konstruktionswandels rechtfertigt. Vermutungen über den Zeitpunkt der Konstruktionalisierung (Traugott & Trousdale 2013), d.h. der Zeitpunkt ab dem die jeweiligen Kontraktionen tatsächlich als Konstruktionen gelten, werden angestellt, bleiben aber trotz der Datenlage spekulativ. Es wird vermutetet, dass Konstruktionalisierung aus empirischer Sicht gegebenenfalls grundsätzlich nicht

eindeutig bestimmt werden kann. In der Summe lässt sich aber klar festhalten, dass die kontrahierten Formen sich von ihren jeweiligen nicht-kontrahierten Formen derart emanzipiert haben, dass sie nicht als einfache, kolloquiale Aussprachevarianten im Gegenwartsenglisch angesehen werden können. Abschließend verweist die Studie auf den Umstand, dass sich durch eine konstruktionsgrammatische Sichtweise auf Kontraktionen die Entwicklungen im Modalsystem noch heterogener darstellen, als bisher angenommen.

Kapitel 5, *English modal enclitic constructions: A diachronic, usage-based account on the status of* 'd *and* 'll, befasst sich mit der Entwicklung der englischen Modalklitika als teilabstrakte, komplexe Strukturen — [[SUBJ*'d*] V] und [[SUBJ*'ll*] V] — und deren Status relativ zu ihren jeweiligen nichtkontrahierten Formen SUBJ *would* V und SUBJ *will* V. Vor dem Hintergrund eines radikal gebrauchsbasierten Ansatzes wird die Behauptung aufgestellt, dass Klitika und deren nichtkontrahierte Formen bei Sprecher:innen mental separat repräsentiert sind, d.h. nicht (mehr) von einer gemeinsamen, abstrakten Generalisierung herstammen. Ziel der Studie ist es neben den Verwendungsfrequenzen auch die Veränderungen in den syntagmatischen Assoziationen, die die Klitika zu ihrer Subjektbasis und dem folgenden Verbinfinitiv haben, zu untersuchen, um somit potenzielle funktionale Unterscheidungen festzustellen. Dabei wird besonders Wert auf Veränderung in den schematischen Slots gelegt, die Hinweise für die Flexibilität der jeweiligen Klitika liefern. Zunächst wird auf die Genreasymmetrie verwiesen, die sich, wie bei den Klitika zu erwarten, daraus ergibt, dass diese vorzugsweise in eher informellen Registern verwendet werden. Um dieser Asymmetrie Rechnung zu tragen, werden die Analysen auf fiktionale Texte begrenzt, da in diesem Genre sowohl kontrahierte als auch nichtkontrahierte Formen konventionalisiert sind. Aus den Daten ergibt sich, dass die Verwendungsfrequenzen der Klitika signifikante absolute und relative Anstiege über letzten 200 Jahre aufweisen. Diese Anstiege können als erste (grobe) Indizien für den voranschreitenden Emanzipationsprozess angesehen werden. Um prüfen zu können, ob die Veränderungen in den Verwendungsfrequenzen allein auf einzelnen, wenigen Instanziierungen basieren, wird die Streuung innerhalb der jeweiligen Subjekt-Slots ermittelt, welche zeigen, dass die Klitika über die Zeit eine stärkere Differenzierung in den Subjekt-Slots aufweisen und somit zunehmend flexibler werden. Allerdings bleiben sie dennoch deutlich in der Streuung hinter den jeweiligen Vollformen zurück Ein ähnliches Bild zeichnet sich für die entsprechenden Verb-Slots ab, die vereinzelte Anstiege in der Produktivität verzeichnen, jedoch keinem gerichteten Trend zu folgen scheinen. Auch hier zeichnet sich ab, dass die nichtkontrahierten Formen in

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ihrer Produktivität ein höheres Potential aufweisen. Diese kombinierte Form relativer Restriktivität wird als erstes Indiz dafür gesehen, dass bestimmte Subjekt-Verb-Kombinationen zusammen mit den jeweiligen Klitika einen höheren Grad an Kohäsion aufweisen als andere. Um die Interaktion zwischen den jeweiligen Subjekt- und Verb-Slots zu analysieren, greift die Studie auf eine neue Form der Kollostruktionsanalyse zurück, nämlich die multiple distinktive kovariierende Kollostruktionsanalyse (Stefanowitsch & Flach 2020) und wendet diese erstmals auf diachrone Daten an. Dadurch lassen sich simultan die Veränderungen in den Subjekt-Verb-Präferenzen der Klitika und deren nichtkontrahierten Formen untersuchen. Die Ergebnisse weisen auf eine distinktive Präferenz der nichtkontrahierten Formen mit unbelebten Subjekten (z.B. *it*, *that*) und Zustandsverben (z.B. *have*, *be*) hin, was starke Indikatoren für epistemische Bedeutung sind. Im Gegenzug präferieren die Klitika belebte Subjekte (z.B. *I*, *we*) und Verben, die auf eine dynamische Bedeutung schließen lassen (z.B. *hate*, *appreciate*, *call*, *meet*). Abschließend kommt die Studie zu dem Ergebnis, dass die Unterschiede im Gebrauch und der Bedeutung der Klitika relativ zu ihren Vollformen sich auf eher niedrigen Abstraktionsebenen manifestieren und auch genau dort betrachtet werden sollten. Höhere Abstraktionsebenen (z.B. eine schematische Klitikkonstruktion) sind zwar denkbar, jedoch zeigen die Daten, dass diese in dem vorliegenden Fall und im Sinne eines dynamischeren, radikal gebrauchsbasierten Netzwerkmodells nicht postuliert werden müssen, um ausreichend erklärt werden zu können.

Kapitel 6, *Revisiting global and intra-categorial frequency shifts in the English modals: A usage-based, constructionist view on the heterogeneity of modal development*, präsentiert eine Neubetrachtung der Entwicklungen im Modalsystem von einer gebrauchsbasierten, konstruktionsgrammatischen Perspektive und stellt somit die Quintessenz der vorangegangenen Fallstudien dar. Nach einem kurzen Überblick des Forschungsstands, wird die Ergiebigkeit und der Mehrwert eines gebrauchsbasierten, konstruktionsgrammatischen Ansatzes in Bezug auf Modalverben und das Modalsystem diskutiert und am Fall von [*won't* v] durchexerziert. Anschließend evaluiert die Studie das von Leech (2011) postulierte Dogma, dass Modalverben im 20. Jahrhundert zweifelsfrei rückläufig in ihrem Gebrauch sind. Es wird anerkannt, dass aggregierte Verwendungsfrequenzen diese Behauptung stützen, die Vorgehensweise an sich jedoch konzeptuell und methodisch äußerst fragwürdig ist. Die Sonderstellung der Modalverben als vermeintlich einheitliche und klar definierte Gruppe rührt in erster Linie von der morphosyntaktischen Kohärenz ihrer Mitglieder her. Eine solche Sichtweise ignoriert in

der Regel jedoch die Bedeutungsvielfalt und intrakategorische, distributionale Heterogenität dieser Gruppe. Auf methodischer Ebene sind aggregierte Verwendungsfrequenzen, sofern sie nicht gleichgerichtet sind, ebenso so schwer glaubhaft zu vertreten. Anhand verschiedener Fallbeispiele wird gezeigt, wie unterschiedlich die Entwicklungen einzelner Oberflächenstrukturen sind, die für gewöhnlich unter einer einzelnen, abstrakten Einheit zusammengefasst werden (z.B. *will*, *'ll* und *won't* > WILL; HAVE *got to*, Ø *got to*, *gotta* > (HAVE) *got to*). Aus konstruktionsgrammatischer Perspektive, bei der Modalausdrücke als komplexe, variable Sequenzen gelten, lässt sich die Behauptung des Rückgangs im Gebrauch der Modalverben etwas entkräften, da zumindest deutlich wird, dass einige von ihnen ansteigende Verwendungsfrequenzen aufweisen. Die Studie stellt abschließend die Frage, welche Modalverben überhaupt gemeinsam betrachtet werden sollten und welche in jedem Fall separater Analysen bedürfen. Eine kohärente Gruppe stellen einige der Negativkontraktionen (*won't*, *can't*, *wouldn't*, *couldn't*, *shouldn't*) in Verbindung mit den folgenden Verbinfinitiven dar. Die Ähnlichkeiten in ihrer Form, Bedeutung, pragmatischen Assoziationen und Distribution legen eine gemeinsame Generalisierung, entweder als Meso- und/oder Metakonstruktion, nahe. Entscheidend ist hier auch das Ergebnis, dass nicht alle negativen Modalkontraktionen sich in dieselbe Richtung entwickeln (z.B. *mustn't*, *shan't*), was wiederrum für Konstruktionswandel spricht. Die negative Kontraktion des periphrastischen DO hingegen verhält sich in ihrer Distribution sehr ähnlich wie die Modalkontraktionen, worauf hin, in Anlehnung an Budts & Petré (2020), die Vermutung angestellt wird, dass Sprecher:innen *don't* eventuell in derselben Exemplarwolke abspeichern, die auch die negativen Modalkontraktionen umfasst. Modalverbkategorien müssen somit als dynamisch, unscharf und prototypisch aufgefasst werden.

Kapitel 7, *General discussion*, fasst die vorangegangen Ergebnisse, Beiträge und Diskussionen in Bezug auf die Entwicklungen im Modalsystem des amerikanischen English im 19. und 20. Jahrhundert zusammen, diskutiert die theoretischen und empirischen Implikationen und evaluiert deren Mehrwert. Als deskriptives Werkzeug, ob mit oder ohne explizite Annahmen über kognitive Realität und psychologische Plausibilität, ist insbesondere das Konzept des Konstruktionswandels (als Teil der Diachronen Konstruktionsgrammatik) hervorragend geeignet, um der Heterogenität der Entwicklungen im Modalsystem Rechnung zu tragen. Ein abschließender Vergleich von framework-open und framework-driven Ansätzen kommt zu dem Schluss, dass der

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ergiebigste Weg, die Feinheiten des Restrukturierungsprozesses um das Modalsystem, zu untersuchen, vielperspektivisch sein sollte, um die Veränderungen auf mehreren Ebenen erklären zu können. Als grundsätzliche Annahme ist dies auch auf andere (lexico-)grammatische Phänomene ausweitbar.