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RESEARCH ARTICLE

Investigating diachronic shifts within a domain of English modality: a study of collocates with *well*

Benoît Leclercq[1] and Graeme Trousdale[2]

[1]University of Lille and [2]University of Edinburgh
Corresponding author: Graeme Trousdale; Email: graeme.trousdale@ed.ac.uk

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Abstract

The English modals have been used as case studies in many domains of linguistic enquiry. Their diachronic development and patterns of synchronic variation in historical and contemporary corpora have been used to develop theories of linguistic representation, to further understanding of correlations between structure and use, and to investigate relationships between form and meaning. However, much of this research explores only the modals themselves: relatively little attention has been given to the study of modal collocations. In this article, we explore variation and change in collocational patterns of two modals (*may* and *might*) when they appear directly adjacent to the adverb *well.* Our analysis is corpus based, using quantitative data to explore macro-level trends in recent American English, and qualitative analysis to explore micro-level variation, particularly with regard to the development of concessive uses of *may* and *might*, and post-modal meanings more generally. We foreground the idea that modals show subtly different diachronic trends in specific collocations compared to perceived trends when looked at as an isolated class of auxiliary verbs.

Keywords: change; collocation; modal; post-modal meaning

1. Introduction

In this article, we present an account of recent developments in a set of collocations involving English adverbs and modal verbs, namely *well may/might* and *may/might well.* Our presentation involves a combination of quantitative analysis (using data from the *Corpus of Historical American English* (COHA; Davies 2010)) and qualitative analysis (considering the function of certain uses in particular textual contexts). These analyses are intended to contribute to a number of research areas relevant to the study of English modality in particular, and work on grammatical change in general.

For the former, we are especially concerned with exploring the development of modal constructions (i.e. usage chunks involving one of the core modals). English modal verbs (as a category) have themselves been the subject of much historical research (e.g. Lightfoot 1979; Warner 1993; Fischer 2007), but more recently, collocations involving modal verbs have come to the fore (see e.g. Lorenz 2024), particularly with regard to explaining how some uses of core modals are changing in frequency. This is informed by the debate regarding the general trend in the use of English modals over time (e.g. Leech 2003, 2011; Millar 2009). In addition, we are concerned with exploring particular developments in post-modal meanings

associated with these modal verbs (Leclercq 2024). For the latter, we seek to contribute to the debate around the 'quantitative turn' in linguistics, particularly in usage-based corpus linguistics, including Construction Grammar (Hilpert 2024). We attempt to strike a balance between the presentation of quantitative trends (as a macro-account of variation and change), and the close analysis of usage in specific contexts (as a micro-account). We find that this combination of methods provides insights regarding the tracking of small-scale changes that underlie the larger shifts. We then reflect on these two different approaches to consider how best to combine quantitative and qualitative approaches. In particular, we look at overall trends in the quantitative corpus work, combined with variation in meaning-making in the qualitative corpus, reflecting general trends in usage-based historical linguistics (Petré 2014).

The article is organised as follows. Section 2 provides a literature review of aspects of approaches to modality with a focus on the development of post-modal meanings, and modal collocations, in both quantitative and qualitative research, along with a summary of previous work on the specific collocations involving *may*, *might* and *well.* Section 3 is the method section, which outlines the quantitative approach we adopted, especially with regard to coding the data. Section 4 is the results section, where in addition to the overall quantitative trends, we also examine factors that relate to speech-act function and pragmatic contexts of use (see also section 2 below). Section 5 provides the conclusion, with some suggestions for future research.

2. Back to the future: changes in the modal domain

2.1. *Modality as a functional domain and a research paradigm*

Due to their being considered 'a paradigm case of grammaticization' (Plank 1984: 308), modal verbs have been and remain a chief testing ground for the study of language change.[1] Attention has for instance been given to the auxiliation of modal verbs (see critical overview in Fischer 2007), the semantic developments of these verbs into and out of the modal domain (e.g. Goossens 1992; van der Auwera & Plungian 1998; Traugott & Dasher 2001: 118–47; Narrog 2012; Traugott 2016) and especially the relation between root and epistemic values from the perspective of both diachrony and language acquisition (e.g. Sweetser 1990; Bybee, Perkins & Pagliuca 1994; Cournane 2015: 51). These discussions have informed the reflections on whether modals are monosemous or polysemous (Depraetere *et al*. 2023: 35–51) and have contributed to creating and comparing taxonomies of modal meaning (Depraetere & Reed 2021). With the advent of digital corpora, English linguistics 'has witnessed a remarkable quantitative turn over the last two decades' (Kortmann 2021: 1207), and this has impacted research practice in the analysis of the development of the English modals. Key publications include seminal work by Krug (2000) on the grammaticalisation of 'emerging' modals and a debate between Leech (2003, 2011, 2013) and Millar (2009) on whether modals are declining, all of which spearheaded a series of studies (e.g. Smith 2003; Biber 2004; Leech *et al.* 2009: 71–117; Nesselhauf 2012; Seggewiß 2012; Smith & Leech 2013: 75–84; Kranich & Gast 2015; Mair 2015; Mair & Leech 2021). With a few exceptions, these studies were largely based on the Brown family of corpora (especially the Brown/LOB/Frown/F-LOB quartet) which, though well designed, exhibit notable limitations in both quantitative aspects (their size) and qualitative aspects (their temporal scope). By comparison, the development of larger corpora such as the COHA (Davies 2010) has allowed the study of more data from a longer time range. This, together with ever finer corpus methods, has led to the emergence

[1] So much so that, comparatively, other modal forms (i.e. adjectives, adverbs or nouns) have garnered little attention.

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of new studies (e.g. Lorenz 2013; Hilpert 2016; Daugs 2017, 2020, 2021, 2022, 2023; Jäger 2018; Kranich 2021; Mair 2021), which served to fine-tune and nuance some of the findings from previous research.

The quantitative turn has, however, been shown to correlate with a decrease in qualitative observations in more recent publications (Larsson, Egbert & Biber 2022), a trend which we regret. We share Kortmann's (2021: 1219) view that linguists should 'interpret [their] quantitative findings against previous linguistic research and theory building', and we sympathise with Fillmore (1992) when he claimed the following:

> There are really good reasons for building corpora, and as far as I'm concerned, the bigger the better. But what I have been saying is probably not encouraging to people who want to do most of their analysis without expecting anyone to have to sit down and stare at the examples one at a time to try to work out just what is the intended cognitive experience of the interpreter, what are the interactional intentions of the writer, and so on. (Fillmore 1992: 59)

Research in the field of modality, as witness the references mentioned so far, fares rather well in this respect. Yet it is not fully immune to the qualitative limitations associated with big data either. It is for instance well established now that some of the core modal auxiliaries are declining (Daugs 2017). While it should be an empirical question what underpins this trend, Leech (2013: 114) argues for instance that 'the most plausible explanation ... is that grammaticalization of the emergent modals in speech has been associated with increasing frequency, progressively leading to competition with the core modals, which consequently have been undergoing decline in recent English.' More recently, Love & Curry (2021) also discuss these changes in the modal domain, but only focus on individual quantitative differences across modal verbs and on the (re)distribution of 'dynamic', 'deontic' and 'epistemic' values through time. As we see it, this fails to deliver on the promise to provide 'a comprehensive perspective on both formal and functional change in modality' (Love & Curry 2021: 538). For indeed, changes within the modal domain show greater formal and functional complexity. At the formal level, recent studies have shown the need to focus not only on modal verbs but also on the specific constructions they appear in. This is in keeping with usage-based Construction Grammar, according to which it is clear that prefabs (i.e. multi-word units) 'are important to the understanding of the fabric of grammaticization' (Bybee & Torres Cacoullos 2009: 212). So quantitative patterns of change are best tracked not only at the level of the verbs but also at the level of the individual constructions they are part of. Daugs (2020: 33) for instance nicely shows that while the auxiliary *should* is generally declining since the 1950s, the form *shouldn't* is actually increasing. Likewise, Kranich (2021: 275) shows that the pattern 'SUBJ *must be* V-EN' is decreasing much sharply than the modal *must* overall. Specific modal patterns have received increased attention in the recent research (see e.g. Adolphs 2007; de Haan 2012; Cappelle, Depraetere & Lesuisse 2019; Daugs 2020, 2021; Kranich 2021; Leclercq 2022, 2024; Schneider 2023; Daugs & Lorenz 2024; Lorenz 2024), but still too few examine English modality from a diachronic perspective. This focus on lower-level constructions is all the more important since they have been shown to display (and develop) unique functional profiles, which is the other main issue we seek to address in this article. Attention has too often been limited to the classical categories of root and epistemic modal meanings. However, the function of modal expressions largely extends past these two domains. For one, these two notions only concern the (truth-conditional) semantics of modal verbs, yet they are also rich in (non-truth-conditional) pragmatic information (Depraetere 2019). Depraetere *et al.* (2023: ch. 4) for instance have shown that the choice of verb to express root necessity is to a large extent determined by a

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pragmatic factor, namely the source of the modality (i.e. the driving force or factor behind a necessary state of affairs, such as specific circumstances or rules and regulations). So in addition to tracing the semantic profile of individual modal verbs and modal constructions, it appears equally crucial to identify how they (come to) differ pragmatically, both synchronically and diachronically. We suggest that this is an approach where qualitative analysis of variation is just as important as the identification of quantitative trends in big data. In addition, even if one were to concentrate on the semantic level only, it is clear since at least van der Auwera & Plungian (1998) that modal verbs do not simply express root or epistemic possibility/necessity; these verbs can also acquire post-modal meanings (i.e. meanings which are no longer associated with root or epistemic possibility/necessity, but instead, for instance, with the marking of concession or conditionality). We are therefore also interested in whether modal constructions (here, collocations with the adverb *well*) might grow to express meanings other than root/epistemic modality, such as was shown in the case of *may* and *might* in factual concessives such as in (1) discussed in Leclercq (2024: 147):

(1) I don't like this. Those guys **may** be helping us, but they're breaking the law.

All of these observations show that, given the trend towards analyses of data from bigger and better corpora (as Fillmore suggested), it is also important that research in the modal domain take a closer look at the local properties of the forms involved in the observed changes and the exact meanings which are involved in these changes. For instance, it appears that post-modal meanings are especially intersubjective and speech-act oriented (Sweetser 1990; Narrog 2012; Traugott 2016), as was indeed argued in the case of concessive *may/might.* In our view, it remains an empirical question in English whether these are the only or the primary functional features involved. In keeping with Traugott (2003: 128), Leclercq (2024) argues that the increase in intersubjectivity in the modal domain must be viewed as correlating with an increase in politeness and attention to face needs. This would entail a tendency towards speech-act softening rather than speech-act boosting, a claim that needs to be empirically verified. This argument is plausible, though, in view of language-external (social) factors that have been identified as crucial in the development of certain semantic categories including modality, namely a trend towards 'democratisation' (see e.g. Myhill 1995; Kotze & Van Rooy 2020; Kranich, Hampel & Bruns 2020), which in language 'refers to the speakers' tendency to avoid unequal and face-threatening modes of interaction' (Farrelly & Seoane 2012: 393). In the field of modality, this would for instance explain the decline of strong deontic meanings such as that expressed by *must*, or the increasing use of modal verbs to serve as polite hedging markers of specific speech acts such as requests (Kranich, Hampel & Bruns 2020: 3).

These observations show that, besides the broad quantitative trends of each verb and their semantic (root/epistemic) distribution, a number of other formal and functional factors now deserve much attention in the modal domain. Our focus on the patterns *may well*, *might well*, *well may* and *well might* is one step in this direction.

2.2. *Modal collocations with* well*: previous research*

In this subsection, we identify and discuss some of the major themes that have emerged in research on collocations between the modal verbs *may* and *might* and the adverb *well*, in the history of English.

First, it must be noted that there are rather few studies that directly focus on these particular collocations. They have recently been looked at from a quantitative perspective by Flach (2021), and previously they had been approached from a more qualitative

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perspective mostly by Hoye (1997) and Shibasaki (2009) but also briefly by Visser (1963) as well as Defour (2010: 185), who suggests that *may well* 'has turned into a fixed idiom in present-day English'. The relative absence of research on these collocations is particularly striking given that *may well* and *might well* have been found to feature among the thirty most strongly associated 'modal + adverb' combinations (Flach 2021: 754), in the *Corpus of Contemporary American English* (COCA), with *may well* even being in fourth position. Flach (2021: 760) also shows that, in this corpus, *well* is in fact 'strongly repelled by all other modal auxiliaries'. This quantitative observation highlights the unique relationship between *may*, *might* and the adverb, and it adds to the need for a careful study of these collocates. Indeed, we concur with Flach (2021: 745) that 'probabilistic information about combinatorial patterns is part of speakers' knowledge', and that they reveal a degree of idiomaticity that deserves to be studied further.

The main question to address then is what the functional contribution of these collocations is, from both a synchronic and a diachronic outlook. In this respect, it is primarily qualitative approaches that have addressed the question, and chiefly from a synchronic perspective. It is interesting to note for instance that Huddleston & Pullum *et al.* (2002: 181) argue that *well* serves to strengthen the epistemic value of *may* in sentences like *He may well have left it downstairs* ('It is quite likely'). This reveals a somewhat compositional view of the collocation, with the adverb simply modifying the force of the modal expression. More detailed qualitative analyses are somewhat less inclined to favour a fully compositional analysis though. Hoye (1997: 233) discusses the difference in this regard between *may well* and *well may*. He considers the first to be more clearly idiomatic (it has a 'unity of meaning') which has the function of indicating a strengthening of the speaker's certainty regarding what is asserted in the rest of the clause (i.e. it suggestsepistemic probability, rather than mere possibility). By contrast, the second is more compositional, with a meaning 'indeed possible'. Hoye suggests that the unity of *may* and *well* (in that order) is not just restricted to meaning, noting that it is 'invariable, and resistant to any form of modification' (1997: 234), which is as much of a formal property as it is a functional one. When the adverb *well* precedes the modal, the expression serves 'to both reinforce the truth-value expressed in the sentence and additionally reflect the strength of the speaker's conviction' (Hoye 1997: 172). For Hoye, the use of *well* therefore serves 'to transform rather than heighten or reinforce' the epistemic modal meaning (1997: 165). From a historical perspective, Jucker (1997: 99–100) observes that there are three meanings associated with *well* that were established by the Middle English period which may be connected to the more grammaticalised uses of *well* in later periods. Of most relevance to the present discussion is the one which is concerned with greater certainty and a lack of doubt. Defour (2010: 168) suggests that this meaning is associated with a 'more subjective' use of the adverb. The connection between epistemic modality and initial position of *well* (as in *well may*) is noted as far back as the Old English period (Traugott & Dasher 2001: 175; Defour 2010: 184). Concerning the relationship between *well may* and *may well*, Defour (2010: 187) provides a quantitative analysis of patterns in the *Helsinki Corpus* (looking at data from 850CE to 1710CE), noting a 'general – although not absolute – tendency' towards a medial rather than initial position for *well* suggesting that *well* may have become a modal particle associated with speaker stance and the marking of politeness (Defour 2010: 188; see also Hoye 1997: 209). We return to these issues in the analysis of our data below.

The specific properties of *may/might well* can be further understood in connection with Hoye's general approach to the alignment of epistemic modal and adverbial meaning (see table 5.1 in Hoye 1997: 240). Certain combinations are 'harmonic' (Lyons 1977: 807f.) in the sense that they both express similar degrees of likelihood (*might* + *perhaps* both express possibility, *must* + *surely* both express certainty), while others are non-harmonic (*should* + *perhaps* combines a 'probability' modal with a 'possibility' adverb). *May well* and *might well* are

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both cases of non-harmonic combinations (a 'possibility' modal with a 'probability' adverb), but as Hoye (1997: 240, footnote to table 5.2) observes, the 'probability' sense of *well* is only attested in combination with *may* and *might* (and *could*, which we do not discuss further). Thus it would be reasonable to suggest that the probability sense is a property of the modal construction (understood here as a conventional combination of modal and adverb) rather than the individual parts.

In both Huddleston & Pullum *et al.* (2002) and Hoye (1997), the use of *well* with *may* and *might* has been discussed in relation to the epistemic sense of the two verbs, and the deontic value of the verbs is not mentioned (nor any other values, modal or post-modal, for that matter). This issue regarding the relationship between deontic and epistemic uses of the collocations has been addressed, again from a more qualitative perspective, mostly in their historical development. Shibasaki (2009: 65) suggests that the collocation of *may* and *might* with *well* 'enhanced' the diachronic emergence of epistemic senses of the modals. That suggests that in the earlier history of the language, both 'sets' of collocations (i.e. both where the adverb precedes the modal and where it follows) had a more compositional meaning (somewhat like Hoye's paraphrase 'indeed possible'), and that the compositionality of the meaning has decreased in the case of *may/might well* over time, certainly to a greater extent than is the case with *well may/might.* At the same time, there are good reasons to believe that this pattern of change (from a compositional to a non-compositional epistemic interpretation), which has received most attention, is not the only idiomatic functional feature at play in the development of the collocates. For indeed, discussing the particular collocation *may well*, Visser (1963: §1667) notes that in Middle English, the expression was used to 'stress the reasonableness of the statement'. If anything, this particular value cannot be considered compositional. So the development of the strong epistemic sense identified earlier is not the only feature of non-compositional meaning that can be found. It is interesting that in the more recent data that will be presented in the rest of this article, this particular use can still be found in Late Modern English. It thus remains an empirical question what exactly constituted the functional profile of *may* and *might* in combination with *well*, how it has evolved and where it is headed.

There is for instance the issue of the relative timing of the development of (inter) subjective meanings associated with the collocations, especially with regard to concessive use, as exemplified in (2).

(2) Using more indirect tools to bring about regime evolution, instead of change, **might well** work but would take years, if not decades (COCA, ACAD: 2005)

Traugott & Dasher (2001: 115–16) do not refer to particular collocations of modals with other lexical categories, but observe more generally that concessive uses, given their metatextual function, will by hypothesis develop rather later semasiologically (see also Bybee, Perkins & Pagliuca 1994: 120). This was recently confirmed by Leclercq (2024) in the case of *may* and *might.* The question we will explore is whether what holds true for individual modals as a category also holds true for modal idioms.

3. Method

We used data from COHA for this study. Given Leclercq's (2024) findings regarding the significant increase in frequency of concessive uses of *may* and *might* from the 1960s onwards, our original goal was to identify potential trends in the development of *may well/well may* and *might well/well might* which could connect to this increase in frequency. For that reason, we focused on the 150 years period leading to this point. For each of *may well* and *might well*, a random sample of 100 concordance lines were extracted for each of the decades

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Table 1. *Frequency of* well may *and* well might *in the annotated dataset*

	1830s	1840s	1850s	1860s	1870s	1880s	1890s	1900s	1910s	1920s	1930s	1940s	1950s	1960s	1970s	Total
well may	45	36	49	39	22	23	38	11	21	15	5	16	13	8	11	**352**
well might	31	54	42	50	36	34	38	16	15	16	16	16	18	8	9	**399**

from 1830s to 1970s, resulting in a sample of 3,000 sentences (1,500 for each pattern). In the case of *well may* and *well might*, which are much lower in frequency, all sentences across the same timespan were extracted.[2] Table 1 gives the exact number of tokens for these patterns after the data were cleaned (see below).

The final dataset on which we eventually performed our analysis thus contained a total of 3751 sentences. To arrive at this figure, note that a number of 'false-positives' had to be manually removed as a preliminary step, such as the following:

(3) The present volume, therefore, will appeal primarily to those interested in the drama; but the general reader as **well may** find value in the story, in the character presentation, or in the social commentary of the various plays. (COHA, FIC:1886)

(4) Complaining of himself, he pushed his last tea cake back into his pocket, since [there might] be a long wait at the boggle's well, and started toward the hill and the winding path as fast as if the **well might** flee before his coming. (COHA, FIC:1956)

In (3), the sequence 'as well' – which is synonymous to the adverb *too* – does not qualify the modal verb but serves as a nominal post-modifier. In (4), *well* is used as a noun. This preliminary procedure resulted in the rejection of 166 concordances in total. In the case of *may well/might well*, each rejected concordance was systematically replaced by another random example from COHA to retain a total of 100 sentences for each decade. Unfortunately, the rejected concordance with *well may/well might* could not be replaced as we had already made an exhaustive collection of the strings from the corpus.

The dataset was then manually coded according to seven different criteria. The first focus on the subject. The aim is to track down person and number (first/second/third person, singular or plural). For instance, we find a first-person-plural subject in (5), and a second-person subject in (6).

(5) We **may well** suppose that a person engaged in such speculations became an object of suspicion to the despotic government of Austria, then wrestling with the athletic young democracy of France for the preservation of her power in Italy. (COHA, MAG:1848)

(6) Aye, **well may** you be dubious about their fate. (COHA, FIC:1860)

The next set of annotation relates to features of the verb-phrase itself. First, it was important to track down the lemmas of the main verb (which in the following examples, are SAY, PONDER, BE, WONDER, STARTLE and RETURN). In addition, we retained information regarding the function of the infinitival complement of the modal, other than bare infinitives as in (7), namely marking passive voice (8), perfect aspect (9), progressive

[2] To do so, we used the queries [may well], [might well], [well may] and [well might] on Mark Davies' interface. This means we focused on cases where the adverb is directly adjacent to the modal (which excludes cases like *may very well* etc.).

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aspect (10), or a combination of these, such as perfect and passive (11) or perfect and progressive (12).

(7) "The poor child --" "You **may well** say that," replied Britt. (COHA, FIC:1905)

(8) These words were written of history. They **might well** be pondered by theologians. (COHA, MAG:1927)

(9) With a little more participation, he **well might** have been the nominee. (COHA, NEWS:1948)

(10) One **may well** be wondering why group 0 blood can be transfused so safely if its serum agglutinates the cells of all other groups. (COHA, NF/ACAD:1958)

(11) **Well might** he have been startled by the change that came over Gaston's countenance. (COHA, FIC:1865)

(12) Worse to have shot so close to officialdom. Yachtsman Raichle, who **may well** have been returning from a legal visit to Wet Canada, foreboded a hard time for the C–209 in his ejaculation: "It's worse than warfare!" (COHA, MAG:1928)

Additional features related to the verb phrase are *not*-negation and subject–auxiliary inversion. While typical *not*-negation is argued to be dispreferred by some of the patterns under study (see section 2.2 above, especially Hoye (1997), on the idiomatic nature of *may well* and *might well*), examples such as (13) can still be found in the dataset. We therefore decided to keep track of its frequency of occurrence. In addition, the analysis revealed that the strings *well may*/*well might* very often appeared in sentence-initial position resulting in subject-auxiliary inversion. So we also attended to this feature in order to pin down potential changes between uses with (14) and without (15) subject– auxiliary inversion.

(13) "How she dances, that one!" "No shame at all!" "I think," one whispered hoarsely, "she has nothing beneath her gown..." "She **may well** not," said another, cattishly, "she's been worn down by many lovers, they say!" (COHA, FIC:1939)

(14) (a) **Well may** the Tammany leaders be alarmed; panic has already broke loose in Fourteenth Street. (COHA, NF/ACAD:1905)
(b) **Well might** they look at each other; for the two faces were perfectly the same, and each one saw himself and herself as others saw them. (COHA, FIC:1888)

(15) (a) Why I have sent for you to-day, You **well may** understand. (COHA, FIC:1866)
(b) John Randolph **well might** have outgrown inherited prejudices and limitations, and attained to the stature of a modern, a national, a republican man. (COHA, MAG:1866)

The final part of the annotation focused on two functional dimensions. One dimension has to do with the value of the modal verb used, whether root (16) or epistemic meaning (17) is expressed. We applied the annotation procedure described in detail in Lesuisse *et al.* (2023). The other dimension concerns concessive interpretation, i.e. whether the pattern is used as a concessive marker (18) or not (19). In this case, the annotation was performed in keeping with the method developed in Leclercq (2024).

(16) What was his hope? What, indeed, we **may well** ask, was his object? (COHA, FIC:1835)

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(17) With a little more participation, he **well might** have been the nominee. (COHA, NEWS:1948)

(18) They **may well** put on this appearance now; but are such their looks when they meet, sometimes for a whole morning, in the painting-room? (COHA, FIC:1856)

(19) This lackey **might well** be their spy. (COHA, FIC:1979)

We now move to the results and discussion section, in which we first present macro-level quantitative patterns of the dataset as a whole, before moving to micro-level textual analysis of specific examples.

4. Results and discussion

One of the initial questions we wanted to explore in this research is whether the four patterns under consideration have undergone any notable functional shift over the investigated decades, and particularly whether they have contributed to the development of *may* and *might* in concessive constructions. To address this, we first analysed the overall distribution of epistemic and non-epistemic uses of these patterns to establish whether the general trend towards epistemic readings of the two modal verbs extends to these specific constructions. The results presented in figure 1 reveal a substantial shift in modal meaning: while the four patterns primarily expressed non-epistemic meanings in the earlier decades (20), by the end of the period, epistemic readings (21) have almost entirely supplanted non-epistemic uses.

(20) (a) The reader **may well** imagine how I felt to meet him. (COHA, NF/ACAD:1849)
(b) there was so much to be said on both sides, that a man **might well** pause! (COHA, FIC:1835)
(c) **Well may** you look grave, It was a cross accident that cast her in your way just now. (COHA, FIC:1830)
(d) **Well might** she doubt her sight, when she could no longer withstand the evidence of her other senses. (COHA, FIC:1840)

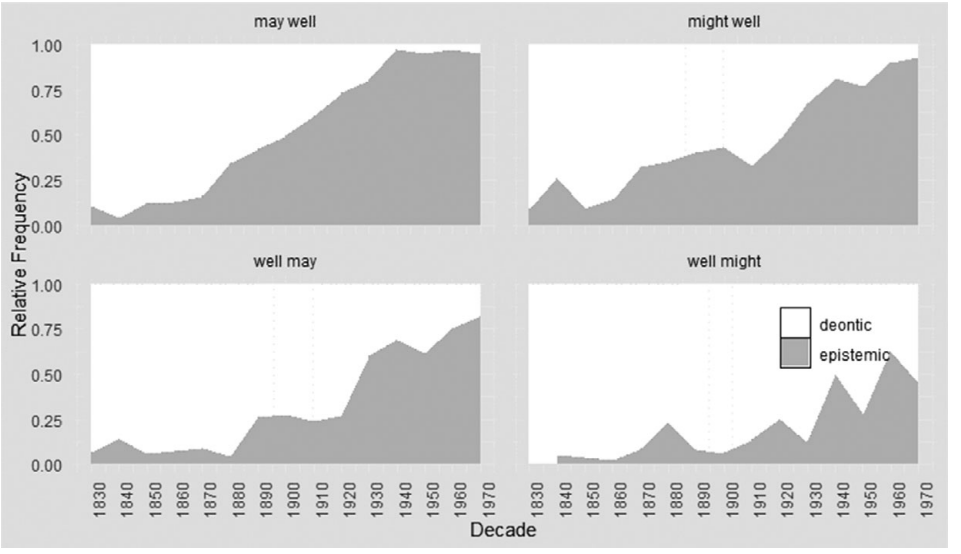

Figure 1. Changes in modal meaning across time (relative frequencies)

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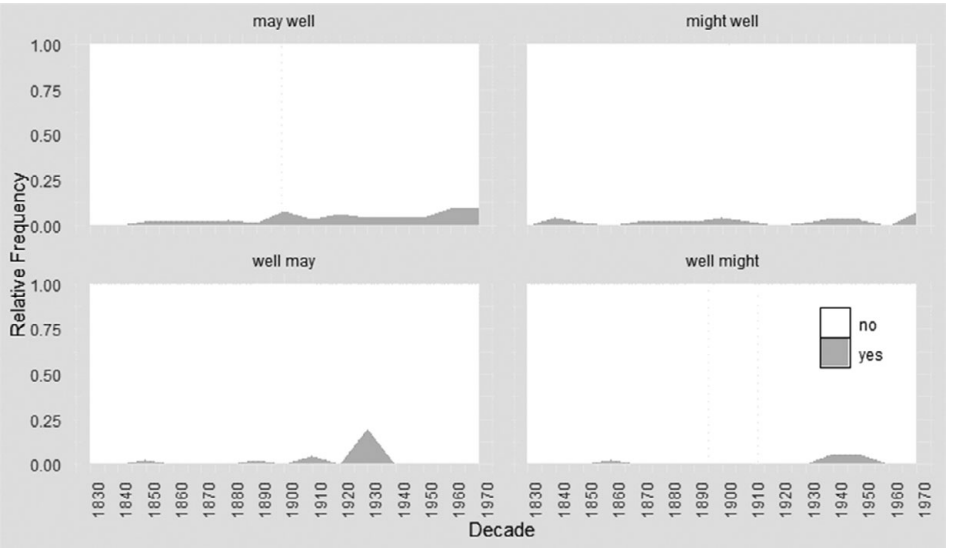

Figure 2. Concessive uses of *may well*, *might well*, *well may* and *well might* (relative frequencies)

(21) (a) The idea of the magic wand **may well** have begun with the divining rod which gained power in the hands of a sorcerer. (COHA, MAG:1976)
(b) Nor did I glimpse the one I was watching for, though it **might well** have been there. (COHA, FIC:1973)
(c) Now she looks me over with undisguised suspiciousness, as though it **well may** be that I am not from a distinguished American university at all. (COHA, FIC:1977)
(d) Travis knew that the Tatar had no way of knowing that the three were alone; he **well might** have believed an unseen troop of Apaches were near-by and so armed. (COHA, FIC:1962)

This shift, though unsurprising, is a crucial component of our analysis, particularly given that it was not necessarily guaranteed to occur in these specific constructions. Concessive interpretations of *may* and *might* appear to have emerged from their epistemic uses (Leclercq 2024). The transition from non-epistemic to epistemic readings for the constructions under discussion in this article, observable in the early twentieth century, thus establishes the necessary groundwork for a potential development of concessive meanings in *may well*, *might well*, *well may* and *well might.* However, the data indicate that none of these four patterns display a notable or increasing association with concessive meaning (figure 2). This is especially true for *well may* and *well might*, which are almost never employed concessively. While concessive uses of *may well* and *might well* are attested (22), their frequency over the period shows a clearly insignificant upward trend (tables 2 and 3).[3]

(22) (a) LARRY What's happening to them is tragic. ROBERT But they are not tragic figures. SARAH I think you're full of shit. ROBERT That **may well** be, but neither tragic or terrible is the right word. (COHA, FIC:1976)

[3] While table 2 reports no significant increase of concessive *may/might well*, figure 2 appears to show some relative increase of concessive *may well.* This is confirmed by Kendall's Tau correlation test, which reveals that *may well* indeed displays a monotonic increase in concessive uses ($\tau = 0.68$).

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Table 2. Ordered binomial log. model (*may well*): Concessive~Decade

Coefficients	Estimate	Std error	z-value	p-value
(Intercept)	−5.52914	101.38991	−0.055	0.957
Decade.L	13.72000	592.51743	0.023	0.982
Decade.Q	−11.37268	584.95162	−0.019	0.984
Decade.C	8.10648	495.64047	0.016	0.987
Decade^4	−3.22825	460.56146	−0.007	0.994
Decade^5	−0.53633	502.54255	−0.001	0.999
Decade^6	2.98942	526.62753	0.006	0.995
Decade^7	−5.07506	482.42104	−0.011	0.992
Decade^8	3.88504	381.84517	0.010	0.992
Decade^9	−3.02433	261.42402	−0.012	0.991
Decade^10	1.54912	154.30358	0.010	0.992
Decade^11	−1.49578	77.58251	−0.019	0.985
Decade^12	0.62665	32.38012	0.019	0.985
Decade^13	0.03498	10.64343	0.003	0.997
Decade^14	−1.29309	2.47038	−0.523	0.601

(b) For although the broadcasters **might well** be content to let ASCAP slip quietly off the air, and then sit back to wait for the verdict of their advertisers, ASCAP, cut off from radio, has turned to the press, where it is now vigorously stating its case and indirectly making a plea for arbitration. (COHA, MAG:1940)

These findings appear to support the null hypothesis, suggesting that the four patterns under investigation may not be linked to a specific role in the development of concessive *may* and *might.*

Nonetheless, it remains crucial to examine these patterns further in order to identify any potential changes that might shed light on key aspects of the verbs' evolution. As noted briefly in the preceding section, these patterns appear to have experienced a marked decline over time, with frequencies decreasing from 13.86pmw (1830s) to 5.19pmw (2010s) for *may well*, from 7.44pmw (1830s) to 2.93pmw (2010s) for *might well*, from 3.43pmw (1830s) to 0.28pmw (2010s) for *well may*, and from 3.79pmw (1830s) to 0.28pmw (2010s) for *well might.* This critical decline somewhat parallels the broader decrease in the use of the two verbs more generally (Leclercq 2024: 131). In keeping with the approach outlined in section 2.1, however, our goal is not only to acknowledge these quantitative changes but also to explore whether they reflect underlying formal and/or functional developments. To do so, we first started by looking at formal traits that characterise these patterns. In earlier stages of English, Shibasaki (2009: 65) suggests that *may well* is rarely negated. In our corpus data of Late Modern (American) English, in at least two of these patterns (i.e. where the adverb follows the modal), *well* seems to affect the extent to which *may* and *might* retain properties

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Table 3. Ordered binomial log. model (*might well*): Concessive~Decade

Coefficients	Estimate	Std error	z-value	p-value
(Intercept)	–8.3159	236.4050	–0.035	0.972
Decade.L	3.2298	1085.7591	0.003	0.998
Decade.Q	–7.2951	1048.5473	–0.007	0.994
Decade.C	6.4196	1059.8854	0.006	0.995
Decade^4	0.4847	920.9581	0.001	1.000
Decade^5	6.1685	992.0509	0.006	0.995
Decade^6	–2.6390	1000.3528	–0.003	0.998
Decade^7	20.2532	1107.3932	0.018	0.985
Decade^8	6.0199	812.7542	0.007	0.994
Decade^9	0.1052	564.7279	0.000	1.000
Decade^10	1.9714	973.9639	0.002	0.998
Decade^11	–8.3199	819.5053	–0.010	0.992
Decade^12	9.7340	753.0204	0.013	0.990
Decade^13	5.3603	885.4955	0.006	0.995
Decade^14	5.5009	569.6298	0.010	0.992

of auxiliaries which they display in other contexts. Only five examples in the entire dataset contain *not*-negation. In addition, no example occurs in interrogative clauses, which require subject–auxiliary inversion (SAI), which suggests that the collocations are found primarily in assertive contexts. The patterns *may well* and *might well* are in fact never used in SAI constructions. Only *well may* and *well might* appear in one specific SAI context, namely clauses with preposed adverbials, as shown in (23) and (24).

(23) Within three years, England yielded in rapid succession every point we had ever claimed. **Well may** the "Times" say that she had gone to the verge of humiliation! (COHA, MAG:1869)

(24) "Tom! Ned! Look! It's that minister we met on the ship – Reverend Josiah Blinderpool! How in the world did he ever get here? And how strangely he's dressed!" **Well might** Mr. Damon say this, for the supposed clergyman was attired in a big checked suit, a red vest, a tall hat and white canvas shoes. (COHA, FIC:1912)

Several critical points therefore need to be addressed regarding this use of the two patterns. The first concerns their frequency. Figure 3 reveals quite clearly that this use of *well may* and *well might* was initially dominant but gradually collapsed, to the point of not being used by the end of the period. Notably, this decline was not offset by an increase in non-SAI uses, which remained stable. It is this specific use of the verbs that appears to have vanished.

The second key point to address is what this loss reveals about both the pattern itself and the two modal verbs more generally. Several factors could explain why the pattern declined.

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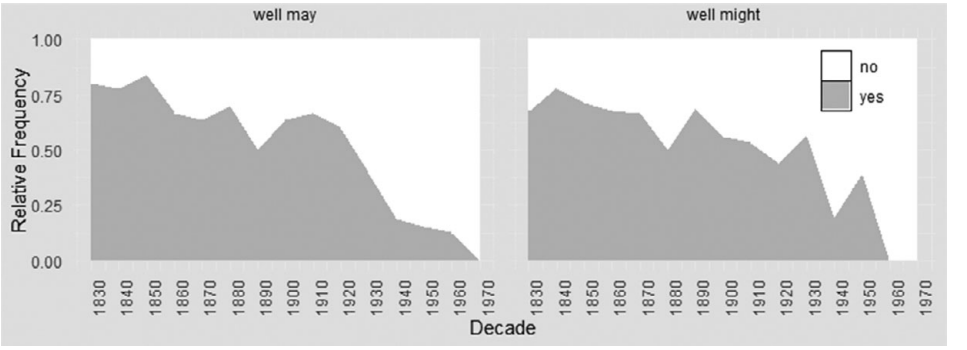

Figure 3. Use of *well may* and *well might* with SAI in preposed adverbial context (relative frequencies)

One is that one of the dominant features of SAI is to be non-positive (Goldberg & Del Giudice 2005). This explains why preposed negative adverbials (e.g. *Never have I said such things*) are preferred to 'positive' adverbs like *well.* Yet, as Goldberg & Del Giudice (2005: 419) point out, when *may* is used as an optative to convey an expressive speech act of hope or wish (e.g. *May the force be with you!*), even though it is non-declarative, it is attested in an SAI construction without negative polarity. Thus, the SAI use of *well may* and *well might* is thus not completely anomalous. We think there are other reasons why they stopped being used. One possible explanation relates to the emphatic discourse function of adverbial preposing. In the patterns studied, the adverb *well* already serves as an emphatic marker of confirmation (which can be paraphrased by *indeed*). Emphasis, however, is intimately connected with negotiation of face between speaker and addressee (e.g. Goffmann 1955; Brown & Levinson 1987). Specifically, emphasis risks threatening the face of an interlocutor, or another individual or group referred to in the discourse. Consider in this regard example (25).

(25) The mighty Italian masters, as you deem them, were not human, nor addressed their work to human sympathies, but to a false intellectual taste, which they themselves were the first to create. **Well might** they call their doings 'art,' for they substituted art instead of nature. (COHA, FIC:1860)

Here the writer admonishes the 'mighty Italian masters' for their failure to create works of art that genuinely reflected nature. While the writer agrees with the notion of referring to such work as 'art', he sees it in a negative light, and thus the emphasis serves to criticise the artists further. As discussed in section 2.1, there appears to be a shift towards democratisation, and so adding another layer of emphasis may have grown to be perceived as excessive. This shift includes the weakening of modal force and the increasing use of modals as hedging device to convey politeness. Furthermore, and closely related to this point, is the question of the function of *well may* and *well might.* These patterns appear to be employed as intersubjective markers, primarily conveying an expressive speech act[4] (that we refer to as 'positive rejoinder') about a (typically) factual clause. We consider this to be a post-modal use of *well may* and *well might.*[5] We believe that, in addition to the previous factors mentioned, the strong pressure on *may* and *might* to convey epistemic modality – by definition, non factual –

[4] In this sense, not unlike optative *may.* See further Visser (1963) on *may well* and reasonableness as noted in section 2.2.

[5] Certain instances of *may well* and *might well* also have this post-modal function, especially in the early nineteenth-century data.

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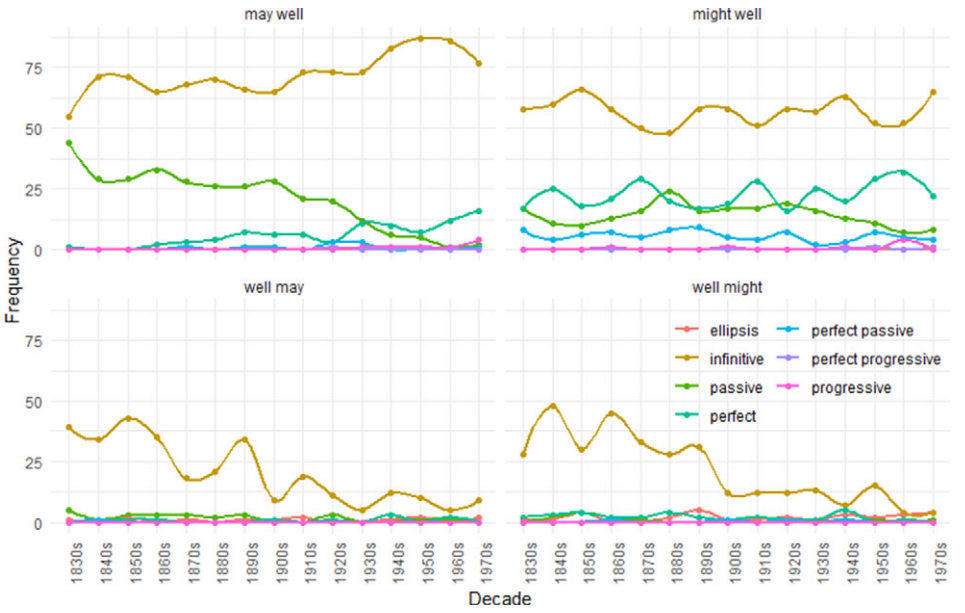

Figure 4. Distribution of lexical verb forms (raw numbers)

played a key role in the decline of these patterns, whose discourse function was based on their non-epistemic uses (see figure 1).[6]

The shift towards the epistemic domain has influenced how the four patterns are used, for besides this semantic shift, other qualitative changes appear to have occurred. For instance, it is interesting to look at the form that the lexical verb takes. As illustrated in figure 4, bare infinitives are by far the most common form and remain the preferred choice over time. However, an exception can be observed in the case of *may well*, where earlier instances frequently included passives, such as in examples (26) and (27).

Interestingly, the use with passives has drastically declined, coinciding with the increasing prominence of epistemic readings of the modal verbs (see figure 1). This decline is especially intriguing because it may initially seem counterintuitive. Indeed, *be* passives are typically viewed as providing a stative construal, a feature that is typically 'associated with epistemic meaning' (Fagan 1996: 19). One could therefore have expected a positive correlation, with passives becoming more frequent as epistemic interpretations increase. However, the observed negative correlation can be explained by the nature of the passive forms used in earlier stages. These were *eventive*, rather than *stative*, passives.[7] Unlike stative passives, eventive passives less readily combine with an epistemic interpretation, instead combining more easily with non-epistemic, discursive interpretations in which one focuses on the materialisation of the situation (rather than its being the case or not).

(26) It **may well** be doubted whether this is altogether wise or Christian. (COHA, MAG:1889)

(27) These sage regions are the habitation of a magnificent bird – the Sage Cock. He **may well** be called the King of the grouse tribe. (COHA, NF/ACAD:1874)

[6] On the link between factuality and epistemic/root modality, see below.

[7] On the distinction between *stative* and *eventive* passives, see for instance Embick (2004). To put it simply, a sentence like *The door was opened* is analysed as a stative passive when it is interpreted as 'The door was in a state of having become open', while it viewed as an eventive passive when interpreted as 'Someone opened the door.'

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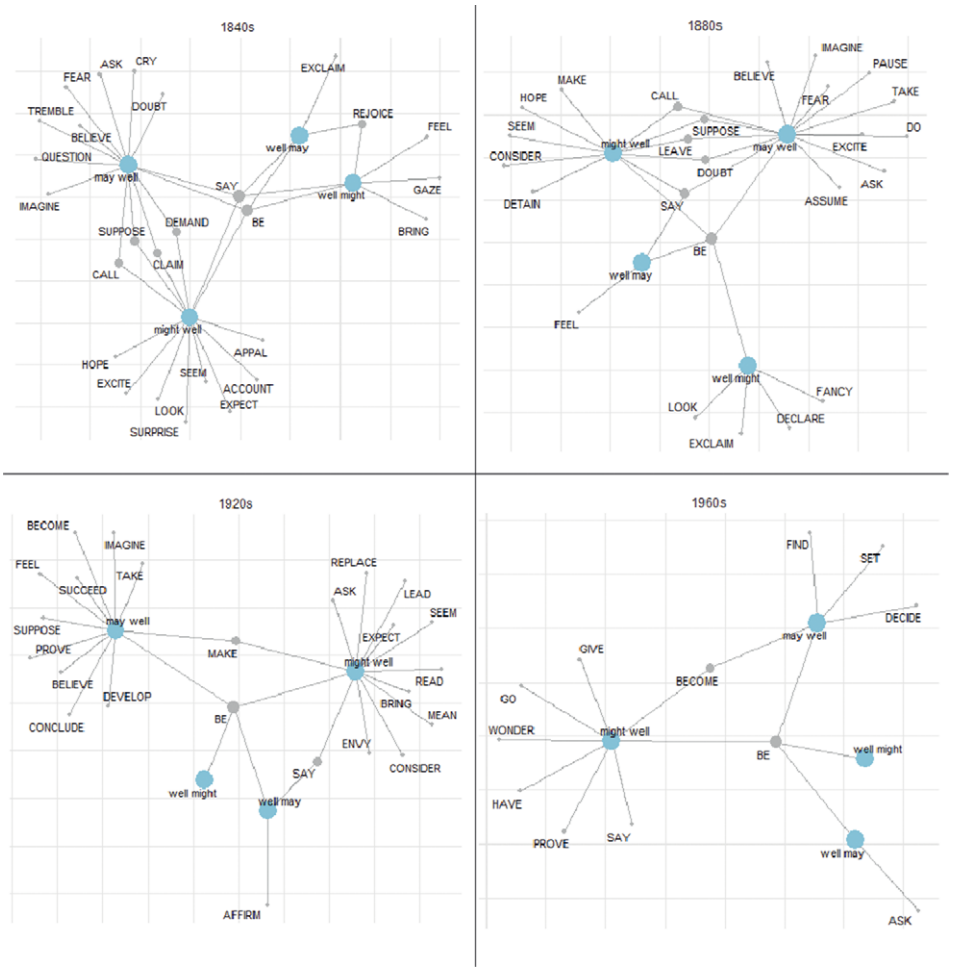

Figure 5. Network representation of collocational preferences

Another dimension of change relates to the collocational preferences of the four patterns, offering insights into their evolving semantic profiles. As noted in section 2.2, early uses (in Middle English) of collocations of *may* and *well*, for instance, were said to have the function of underscoring 'the reasonableness of a statement' (Visser 1963: §1667). Our analysis of data in the Late Modern period suggests that this interpretation may be closely tied to a specific set of verbs. In the earlier decades of our dataset, as shown in figure 5, verbs of saying (e.g. *ask*, *say*, *exclaim*) and verbs of cognition (e.g. *imagine*, *believe*, *doubt*, *suppose*) dominate,[8] as illustrated in the following examples:

(28) The city shakes, and every hill resounds. Yes, we **may well** rejoice, and well repair,
With praise, to Him who heard our anxious prayer. (COHA, FIC:1846)

[8] Note that figure 5 contains verbal collocates that occurred more than once (i.e. hapax legomena were excluded). For expository purposes, it also displays collocational profiles spanning four evenly spaced decades. Detailed profiles for each of the fifteen decades are provided in figure A1 in the appendix. Each of these profiles was obtained using the `network_plot` function of the `ggraph` package in R, with the node size of the lexical verbs indexing their frequency.

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(29) "Have the catholics no eyes? For heaven's sake draw your veil, or we are ruined." Madam La Framboise **might well** utter these astonished and terrified exclamations; for in the joy of that unexpected recognition, her young companion had for a moment forgotten the perilous circumstances that surrounded her. (COHA, FIC:1831)

(30) "For myself, I was shocked and scandalized, and still can not but feel deep concern, Deacon Mudgridge [...]" "And **well may** you feel concern in the matter, brother Dummer" (COHA, FIC:1860)

(31) 'He is getting unsteady and wild!' **Well might** the old gentleman say so. His son was as wayward and independent as the wind. (COHA, FIC:1847)

This is understandable, as verbs of saying and cognition generally take clausal complements (Biber *et al.* 2021: 655), which typically serve 'to describe what someone else has said or thought' (Francis, Hunston & Manning 1996: 103). This meaning is essential to the discursive function of *may/might well* and *well may/might.* In later decades, however, as the epistemic gains prominence and the factual discursive interpretation recedes, the collocational profiles of our patterns diversify, encompassing a broader range of verbs. So the shift towards the epistemic domain appears to have triggered a qualitative change in collocational preferences.

Now, as was briefly mentioned before, the intriguing question remains why the factual discursive function of the four patterns under study appear to have faded. Several explanations have been proposed for *well may/might.* One such explanation is that the rise of epistemic meaning, which inherently calls into question the factual status of a proposition, was incompatible with the factual nature of the propositions occurring with [(*well*) *may/might* (*well*)]. After all, it is most likely that the post-modal interpretation of these patterns evolved from the deontic value of *may/might* (similar to their optative use, cf. van der Auwera & Plungian 1998: 110). However, this argument fails to be entirely convincing. For one, deontic modality is equally non-factual, and in this respect it should not have allowed for a factual interpretation of sentences with [(*well*) *may/might* (*well*)] any more than epistemic modality. This is all the more true given that, under the right circumstances, both deontic and epistemic uses of modal verbs have already been found to co-occur harmoniously with factual propositions, as seen in constructions with *be able to* (Leclercq & Depraetere 2022; Leclercq 2022) and factual concessives with *may* and *might* (Leclercq 2024). Thus, the issue is not simply the apparent incompatibility between the non-factual status of the modal verbs and the factual nature of the propositions they accompany. (In fact, one may in this respect view the four patterns studied here as indeed providing at least an incentive to the development of concessive *may* and *might* from the 1960s, since our data reveals that the two verbs have been used in factual contexts before. While these four patterns may not be argued to have led to, or licensed the development of factual concessive *may* and *might*, they have at least warranted it by providing a valuable precedent.) Additional factors are likely at play. In the case of *well may/might*, it has been suggested that SAI is likely to have disappeared because it emphasised an already emphatic pattern. This line of inquiry seems particularly compelling, since using emphasis in this way runs counter to the tendency towards democratisation discussed in section 2.1. The development of epistemic meaning, which constitutes a quintessential hedging function, by contrast, aligns with this democratisation tendency and therefore naturally grows in prominence. A pattern that does not hedge or serve as a politeness strategy (such as was shown to be the case with concessive uses of the two verbs) but instead strengthens the speaker's speech act appears to diverge from the expected trajectory. This misalignment is particularly striking when considering a

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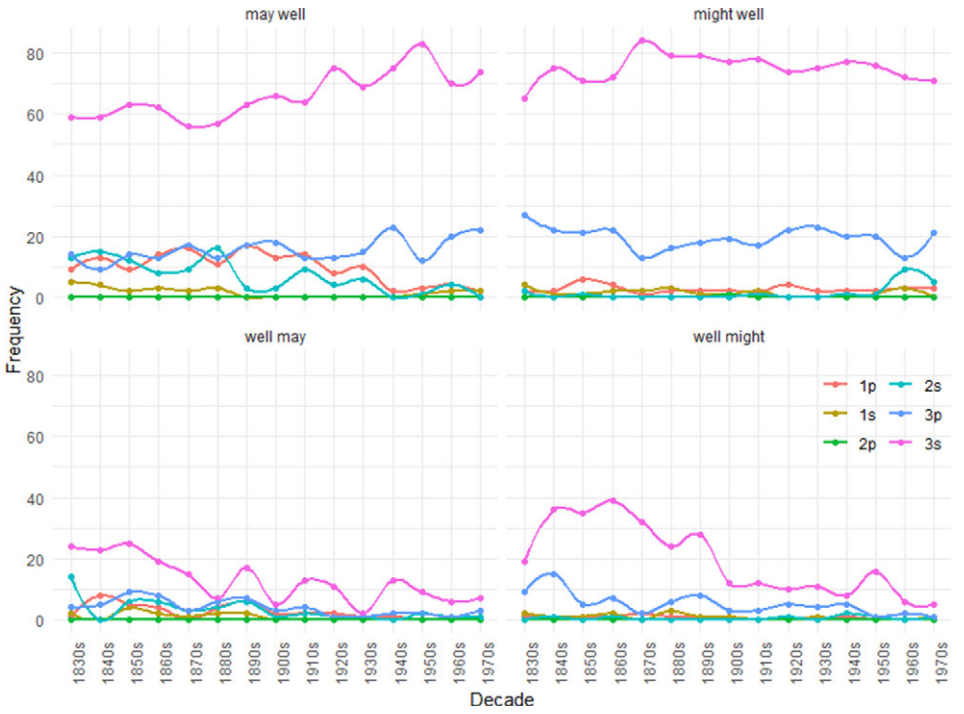

Figure 6. Distribution of subject person and number (raw numbers)

key feature identified in the development of concessive *may* and *might*: a notable increase in intersubjectivity. While the functional profile of [(*well*) *may*/*might* (*well*)] does exhibit a degree of intersubjectivity, they may not be intersubjective enough, or they may create speech acts that are too 'forceful', which may be dispreferred. Our analysis indeed shows that most subjects that are used with these patterns are (increasingly) third-person subjects (see figure 6). Yet as Traugott & Dasher (2001: 23) point out, intersubjectivity fundamentally includes a social 'first person–second person deixis'. This feature is clearly absent from our data, which may help further explain the pattern's decline.[9]

5. Conclusion

The research presented in this article suggests:

a. Deontic uses of the collocations were typical in the early nineteenth century but by the end of the twentieth century, there has been a significant shift towards epistemic uses.

[9] The results shown in figure 6 may be artefacts of genre-specific distribution, though, so spoken data for each of these decades would also have to be analysed to confirm our observations. In addition, as was pointed out by an anonymous reviewer, the neutral > subjective > intersubjective progression that modals make as they shift from root to epistemic meaning, and then to post-modality, predicts a drop in first- and second-person subjects: while it is quite common to talk about 'me' or 'you' having the right to do something, it is uncommon to make assumptions about oneself. Yet in our data we do not witness a shift and third-person subjects are and remain the most common through time regardless of the meaning expressed.

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b. There is a general decrease in frequency in the use of these collocations as a whole during the Late Modern English period; this is particularly the case for *well may* and *well might.*
c. There is some evidence that the collocations have developed both formal and functional idiosyncrasies, such as an increasingly limited (and functionally specific) use in SAI contexts for *well may* and *well might.*
d. There is also some evidence that, having developed these idiosyncrasies, there is some host-class expansion in terms of the lexical semantics of the main verb complement. Having previously favoured verbs of locution and cognition in the early nineteenth century, users of English increasingly diversified the complement types.
e. In relation to post-modal uses, there is no evidence that the collocations directly brought about the development of concessive uses of the modals, though they may have facilitated this. In particular, the collocations appear increasingly to favour third-person subjects, which may limit their intersubjective potential.

More generally, in terms of the past, present and future of modality, our study has:

a. confirmed some well-known trends established in the past (e.g. that as in other contexts, collocations of *may* and *might* with *well* show a shift from deontic to epistemic uses over time);
b. suggested that present-day uses in some contexts have particular idiosyncrasies (e.g. specific SAI contexts for *well may* and *well might*);
c. outlined how modal collocations connect with specific post-modal uses of *may* and *might* (especially in connection with concessive uses).

Our analysis has made use of both quantitative and qualitative methods. Without the former, we would not have been able to provide a discussion of frequency trends over the past two centuries: these trends have shown ways in which uses of *may* and *might* in collocation with *well* appear to be similar to and different from uses of the modals in other contexts, and these broad trajectories are important for understanding how past uses of the modals relate to present uses. Without the latter, we would not have been able to provide as clear an account of the discourse functions of the collocations, in particular in cases where there are formal or functional idiosyncrasies associated with the collocations; such an analysis enables us to see how the collocations do or do not align with other post-modal functions of the English modal verbs, as well as their capacity for intersubjective use. We hope that the approach we have adopted is one which combines many of the insights of past and present studies in usage-based linguistics while at the same time offering some suggestions for future work in the field.

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APPENDIX

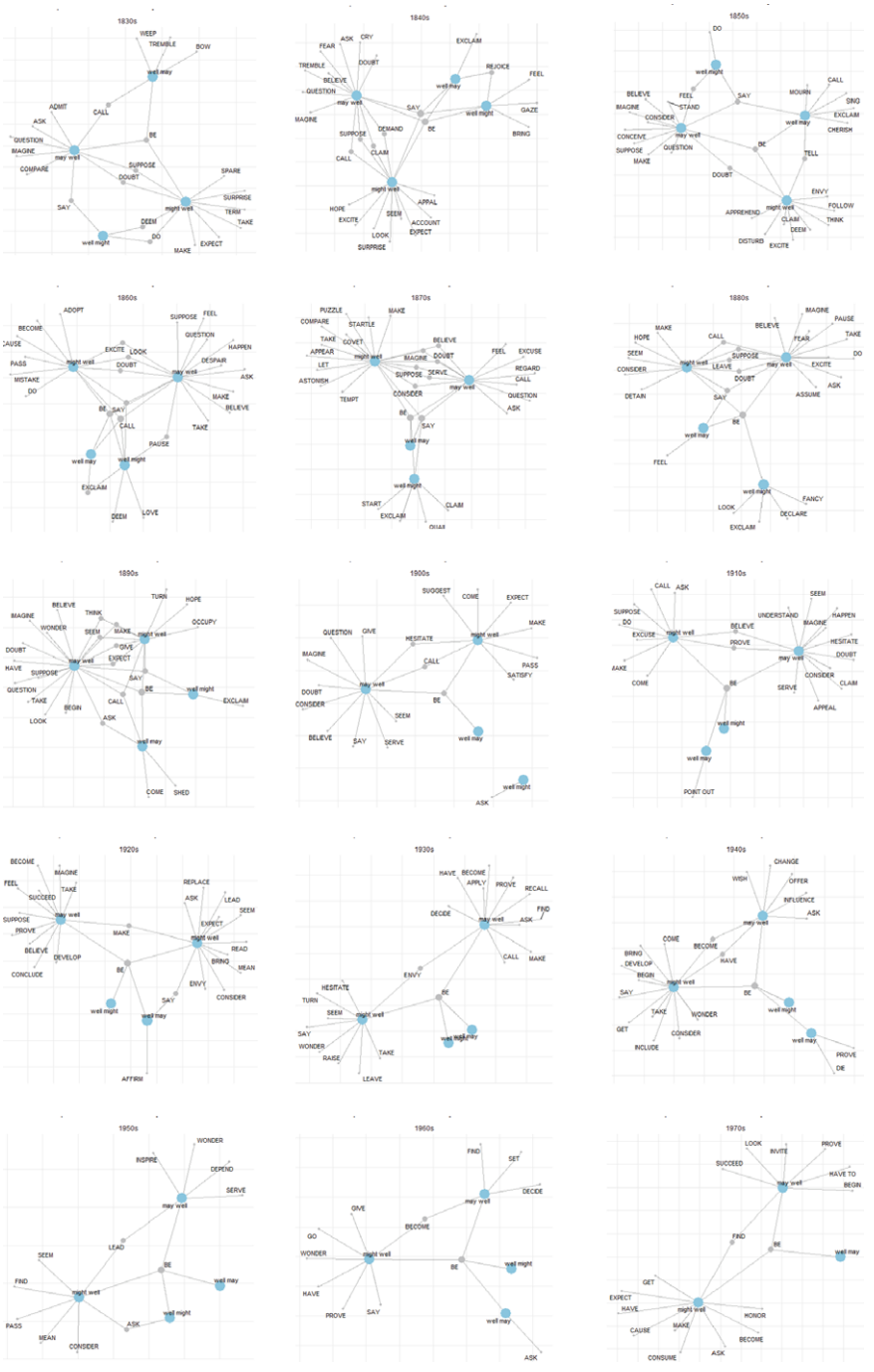

Figure A1. Network representation of collocational preferences: profiles for each of the decades, 1830s–1970s

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