

How to Cite This Article: Bashir, A., Ullah, I., & Iqbal, L. (2023). Epistemic Modal Verbs in the Field of Linguistics and Literature: A Corpus-Based Study. *Journal of Social Sciences Review*, 3(2), 736–744.
<https://doi.org/10.54183/jssr.v3i2.310>



Epistemic Modal Verbs in the Field of Linguistics and Literature: A Corpus-Based Study

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Vol. 3, No. 2 (Spring 2023)

Pages: 736 – 744

ISSN (Print): 2789-441X

ISSN (Online): 2789-4428

Key Words

Modal Verbs, Epistemic Modality, Corpus-based, Linguistics, Literature

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Abstract: *Epistemic modality, a linguistic category, particularly deals with the interactive dimensions of various discourses. Epistemic modality in broad terms can be defined as any modal system that indicates the degree of assurance of what a speaker says. The present study identifies and analyzes the epistemic modal verbs EMVs in the dissertations of linguistics and literature. For this purpose, two sub-corpora of Ph.D. dissertations from the fields of linguistics and literature were constructed. The concordance tool AntConc3.5.8 was used to analyse the selected modal verbs. The most frequent epistemic modal auxiliaries used in both disciplines were found to be may, would and could. Interestingly, the EMVs were deployed by the researchers of linguistics more than twice as much used by the researchers of literature.*

Introduction

Academic discourse, and more specifically research language, has historically been characterised as neutral, objective, and subjectivity-free. Yet, during the past few decades, pragmatically oriented research in the field of academic discourse has revealed a vastly different viewpoint. In addition to being presumed to be factual research reports, research papers and dissertations can also be seen as a sort of conversation between authors and readers within the academic discourse community. This interpersonal function of research writing refers to the way in which the writer interacts with their audience and creates a relationship with them through language. In academic research writing, the interpersonal function is crucial for building

credibility, establishing trust, and engaging the reader. This can be achieved through the use of an appropriate epistemic modality marker that is suitable for the intended audience and context.

Epistemic modality, a linguistic category, particularly deals with the interactive dimensions of different discourses. Epistemic modality in broad terms can be defined as “any modal system that indicates the degree of commitment by the speaker to what he says” (Palmer, 1995). This degree of commitment on the scale of the truth-in-proposition scale can range from uncertainty, and neutrality to certainty (Nuyts, 2000). In academic discourse, epistemic modality is used to signal the level of confidence the speaker or writer has in the

knowledge they are presenting and to qualify or hedge their statements to show their awareness of the potential limitations and uncertainties of the knowledge. For example, words and phrases such as "probably," likely, "might," could," and "may" are commonly used to indicate different levels of epistemic modality in academic writing.

Linguistic items prototypically used for expressing epistemic modality are deployed from modal auxiliary verbs, lexical verbs, adverbs, nouns and adjectives. However, The present study identifies and analyzes the epistemic modal verbs EMVs in the dissertations of linguistics and literature.

Framework of the Study

Systemic Functional Grammar as commonly known as SFG gives a proper background and comprehensive framework to the study of modality. SFG has been proposed and worked on by Halliday (1970). He believed that language is as it is because of the functions it is required to serve. Halliday's Systemic Functional Grammar focuses on the functional parameters of language. It is a significant distinctive feature that is concerned to explain the language and its internal organization based on functions that it has developed to serve (Halliday 1978, 1994)). When we look at language through the functional or communicative perspective, it can be said that every utterance or sentence by a writer is a choice, he makes by adapting to the meaning they want to convey through any lexicogrammatical means available in a particular language under the influence of cultural and social construct.

There are several levels or dimensions of epistemic modality, including:

Degree of Certainty: This refers to the level of confidence the speaker or writer has in the truth of a proposition, and can range from absolute certainty to complete uncertainty.

Source of Information: This refers to the basis on which the speaker or writer forms their epistemic

modal judgment, such as personal experience, observation, inference, or hearsay.

Time Reference: This refers to the temporal context in which the speaker or writer makes their epistemic modal judgment, such as present, past, or future.

Speaker or Writer Stance: This refers to the speaker or writer's attitude toward the proposition, such as neutrality, belief, doubt, or skepticism.

Literature Review

The effective use of epistemic modality is a determinative factor in achieving success. Students/scholars in an academic context are required to use them carefully and properly while putting forward their statements in both written and spoken communication (Hyland 1996). The most detailed account of epistemic modality in academic discourse has come from a leading scholar Ken Hyland whose study is based on English for Academic Purpose (EAP) studies. His research has thrown light on the idea that scientific academic writing is more than just the presentation of propositional facts. It's a relationship between writer and their readers. To study this writer-reader relationship, he has explored a wide range of linguistics devices (Hyland 2004, 2005, 2009). In his work, epistemic modality is extensively dealt with as engagement markers in research articles and reported in different research (Hyland, 1998a, 1998b, 2001). Hyland's study of boosters and hedges as epistemic modals were conducted on the corpus of 240 research articles from 8 disciplines (from soft disciplines and hard disciplines). He has provided insight into the interactive roles and functions of boosters and hedges, the type and frequency of boosters and hedges used in the different IMRD sections of research articles and discipline-based choices in the use of epistemic modality. His analyses have led him to the conclusion that these epistemic modality markers are more frequently used in soft disciplines than in hard disciplines. His result has also revealed that *will*, *show* and *the fact*

that is the most widely used boosters and *may* would and *possibly* are the most widely used hedges in research articles. Academic writers tend to often use these epistemic markers to achieve persuasion in readers and "to construct and negotiate social relation" (Hyland 2012).

Vold (2006) has conducted a cross-disciplinary corpus-based study of research articles from linguistics and medicine written in three different languages; English, French and Norwegian. She has compared the hedges, as tools of epistemic markers, firstly, across the two disciplines (Linguistics and Medicine), secondly, across the three languages (English, French and Norwegian) and, thirdly, to explore their frequency and use by different genders. For her study, she has selected eleven epistemic markers exploring their variations in frequency and their communicative functions across the two disciplines of three languages. The result shows that English and Norwegian researchers tend to use more expressions of uncertainty compared to French researchers. No considerable differences in the frequency of the selected epistemic markers could be found in the two disciplines. However, the preference for one marker over another was noticed in the two disciplines of the three languages. The gender of researchers had little influence on the frequency of these markers in texts. *Seem* is found to be the most commonly used epistemic marker in English research articles from the linguistics discipline. Whereas, in medical research, articles *may* is found to be the most frequently used epistemic marker. The use of *suggest* is common in the two disciplines, as it is the second most highly used marker in both disciplines. When it comes to conclusions researchers of both disciplines are almost equally cautious to avoid criticism and negative consequences in case later stages the conclusions prove to be wrong (Vold 2006). For this purpose, *may*, *might* and *suggest* are often used as epistemic markers, but in linguistics *seem* and *appear* are also frequently used for the same function.

Nordberg (2010) in his study entitled "Modality as portrayed in upper secondary school EFL textbooks: A corpus-based approach" investigated the two EFL textbooks series *In Touch* and *Culture Cafe* of two Finnish upper secondary schools for the reason that they are undoubtedly the most used EFL series in Finland. From the series comprising 8 books each, the researcher has handpicked the one with explicit discussion on modal verbs for his corpus study. It was realized that the authors of *In Touch* and *Culture Café* have adopted a different attitude towards English Modality. The former discussed it with a focus on literary texts and formal settings, including more excerpts from literary texts and novels; whereas the latter discussed it within the framework of communication including more excerpts from internet sites and magazines. It is important to mention that both series included modality in their optional course.

The corpus was analysed through Antconc getting the KWIC search of core modals, finding their relative frequency and finally analyzing them semantically, grouping them based on their meaning. *Will* and *Can* is found to have the highest hits with 169 in each. *Would* it not be much less with 162 hits? In 169 occurrences *can* 8 (4.5%) were used with epistemic meanings. As for the *may* and *might*, the number of them with epistemic meaning is quite high. *May* is found to have 31/37 (83.8%) and *might* 29/31 (93.5%) hits as epistemic. It is also suggested that *may* and *might* in present-day English is more restricted to 'possibility' meaning. *Will* and *would* for the most part have been used as epistemic carriers of prediction. Seeing all the core modals in comparison with the present day English it was concluded that each of these textbook series tends towards one of the meanings of core modals, downplaying the other important meanings.

A qualitative study conducted by Aidinlou & Mohammad (2012) attempted to investigate five short stories randomly selected from Lawrence, O. Henry, Plunkett, Steinbeck and Joyce. The

researcher hypothesizes that literary texts may have a high frequency of epistemic modality since in such texts writers' propositions are usually influenced by their ideology. They attempted to show that modality in literary texts is textualized at the lexico-grammatical level through different modal auxiliaries, lexical verbs, adverbs, nouns and adjectives. Among all these lexico-grammaticalization modal auxiliaries are used more frequently by writers to express their attitude towards their propositions. The findings demonstrated that 226 modal auxiliaries have been used by all the writers of five short stories, of which 109 were epistemic modality; whereas 117 were from root modality. It has also been observed that these epistemic modals haven't been used at an even rate. These epistemic modals have further been categorized on the basis of their underlined ideologies; *inference*, *possibility*, *probability* and *belief*. The *inference* is textualized through *must*, *can't* and *couldn't*; *possibility* through *may*, *might*, *can* and *could*; *probability* through *should* and *ought to*; finally *belief* or higher degree of confidence is lexico-grammaticalized through *will* and *would*. As for the frequency of these ideologies, the use of these epistemic modals by the writers of literary narratives is mostly of *possibility*.

Taşpınar (2017) in his study entitled "Epistemic Modality in Academic Writing-A discipline-based analysis" explored hedges and boosters as important indicators of epistemic modality in the journals of two different disciplines i.e. education and engineering. The linguistic devices involved 12 boosters and 16 hedges for the analysis. 134 total boosters and 516 hedges were found to be used in International Journals of Educational Research. As for their frequency in International Journals of Engineering Sciences, 75 boosters and 153 hedges were used. To relatively see the hits of booster and hedges in both types of journals the numbers are quite high in the IJER. Some Hedges and boosters were found to be more frequently used than others in both IJER and IJES. To begin with hedges, *May* is the one with the highest (114),

could 78, *indicate* 76, and *suggest* 65 hits in IJER. *Seemingly*, *speculate* and *possibly* had the least frequency. *Assume* is the most frequently used hedge with 69/153 hits and *May*, *indicate* and *appear* were also preferred over other hedges in engineering journals. *Likely*, *possibly* and *probably* had the least frequency. Now considering boosters, it was found that *clear*, *certain* and *show* are the preferred boosters in educational research whereas, *definitely*, *definite*, *obviously* *show* and *substantially* had no hits. The frequency analysis of boosters in engineering journals shows that *clearly* is the mostly used booster and *definite*, *certain* and *substantially* were least preferred. So, the finding led to the conclusion that boosters and hedges are comparatively more used in educational research papers than in engineering journals. It was also observed that hedges were preferred over boosters in both disciplines. But to see the relative percentage of frequency of boosters it was revealed that scholars of engineering used more boosters than the scholars of education.

We are aware of any study that examines any part of the rhetorical characteristics of RAs in English written by Pakistani scholars. As mentioned in the introduction, the majority of research on academic writing in English in the Pakistani context has neglected the research scholars. Therefore, the goal of the current work is to fill this gap.

Methodology

The current study intends to describe the frequency of the use of epistemic modal verbs. For the purpose to obtain and describe occurrences and frequencies, mathematical and statistical tools were used. Researches that use mathematical and statistical methods are part of empiricist/ positivist research and such research utilizes quantitative research methods. To obtain the quantitative data and their analysis, it was considered important to follow the Empiricist research paradigm.

Corpora

This research is the corpus-based study of epistemic modal verbs as a rhetorical device used in Ph.D. dissertations in the discipline of Literature and Language for this purpose, two sub-corpora—one corpus representing researchers of pure English literature and another corpus representing researchers of linguistics—were developed to address the objectives of the study. As we found no publicly available corpora of dissertation in the fields of English Literature and linguistics in the universities of Pakistan, therefore, we had to construct our own corpus, as in McEnery et al (2006) terms "do it yourself" DIY corpus.

The Pakistan Research Repository (PRR), a project of the Higher Education Commission Pakistan, was used to retrieve the Ph.D. theses in the domains of English literature and linguistics published from 2000 to 2019. It was necessary to create and compile our own corpora from PhD theses and research in the domains of English literature and linguistics to represent the research repertoire in the aforementioned fields given the goals of the studies. As a result, the stages listed below were involved in creating the entire corpus.

1. All of the Ph.D. theses that were available in both fields were downloaded first and then converted from PDF to Word format.
2. Since they are not a part of the main body of the dissertation, title pages, acknowledgements, dedications, abstracts, notes, and references were all deleted from each dissertation.
3. To make it easier to analyse and process the corpus following the study's objectives, the

major body of each dissertation was stripped of its tables, figures, graphs, calculations, and inventories.

4. To remove all the numbers and multiple spacing, each text was uploaded to Textfilter.com, an internet service.
5. Texts were saved in plain text format after being filtered by Textfilter.com.

The design of this study is corpus-based and quantitative. To generate significant "generalizable results," the corpus in this design must be large and sizable in number (Biber 2009: 1287). So, it was decided that a corpus of roughly one million words, with each sub-corpora containing close to 500,000 words, would be appropriate for the current investigation. Given the average length of a Ph.D. dissertation, 8 dissertations from each discipline were deemed sufficient, making a total of 16 Ph.D. dissertations in corpora. The dissertations in linguistics had a sub-corpus of 530319 words, compared to the dissertations in literature's 564308 words. The size of the corpus turned out to be sufficient because the epistemic markers appeared quite frequently. The slight difference did not affect the result as the data was normalized rather than taking the raw frequencies.

Analysis Procedure

Selected Epistemic Modal Verbs for the Study:

Following Ngula (2015: 115), who reports that the majority of the epistemic modal verbs signalling epistemic modality, we constructed a similar list of 7 elements under the linguistic categories of modal auxiliary verbs.

Table 1

List of all the epistemic modal verbs under study

Modal Verbs						
could	may	might	must	shall	would	will

Concordance Analysis: We conducted the analysis using the concordance searching tool AntConc

3.5.8 to investigate the epistemic uses of the mentioned elements in the Ph.D. dissertation's

sub-corpora of linguistics and literature. We examined the entire result of the given modal verbs, but since it was likely that these items were conveying functions other than epistemic, we carefully went over the entire concordance lists of these items to distinguish between the epistemic and non-epistemic meanings. Only the actual instances of epistemic usage were documented; the remainder were removed. We provide a few examples to drive home the argument.

We found 572 total instances of the modal verb "will" in linguistics, 361 of which served an epistemological purpose. The uses of "will" in Examples 1, 2, and 3 are both epistemic and non-epistemic.

1. The research will also be beneficial for pedagogical implications in newspaper editorial writing... R7Ling.txt
2. This study will advance the studies cited above to identify how social factors affect linguistic cognition which is reflected through the learner's use of language particularly syntax. R6Ling.txt
3. ...you want to ask for permission to enter the room you will ask from teacher to

come in and utilize the symbols which are saved in your mind... R5Ling.txt

The modal verb "will" is employed epistemically in the first and second examples, however, in the third example its use is non-epistemic.

Results and Discussion

Frequency of Epistemic Modal Verbs

The analysis of all the instances of the epistemic modal verbs EMVs in the Ph.D. dissertation on English literature and linguistics has revealed several patterns and trends. As noted already, epistemic modal verbs are the second most highly used epistemic markers in both corpora. As far as the comparative frequency across both disciplines is concerned, Ph.D. dissertations in Linguistics are found to have more frequency of EMVs than the PhD dissertations in Literature as shown in the table given.

Table 2 shares the frequency of epistemic modal verbs in both corpora. We didn't collect the crude count we got for each modal verb in both the corpora, considering the fact that these markers can be polysemous in nature (Coats 1983; Palmer 1990) and their function and meaning can be determined in the context they are used in. The normalized frequency per 10,000 words is also listed.

Table 2

Frequency of Epistemic Modal Verbs in Both the Corpora

Ranking	Linguistics			Literature		
	Frequency wise	EMVs	Raw Frequency	Frequency/ 10,000	EMVs	Raw Frequency
1		May	871	16.42408	would	428
2		Would	706	13.31274	May	336
3		Could	412	7.768909	Could	206
4		Will	361	6.807224	Will	186
5		Might	95	1.791375	Might	94
6		Shall	02	0.037713	Shall	02
7		Must	07	0.131996	Must	10
Total			2454	46.27403		1262

The above table suggests a notable difference in the frequency of EMVs across the two disciplines. Researchers of linguistics have more of a tendency to use EMVs to express their research claims. Table 2 shows the frequency of epistemic modality markers across both disciplines. The contracted form of each Modal Verbs *won't*, *wouldn't*, etc. was part of the epistemic markers in the study (as they too can carry epistemic value), but noticeably they are found missing in both the corpora. However, it is not surprising as they are more likely used in spoken discourse than written discourse (Biber et al. 1999).

Table 2 reveals that the five top commonly used modal verbs expressing epistemic modality (*may*, *would*, *could*, *will* and *might*) are almost similar in both disciplines. Although the frequency in both the discipline is found to be radically different. Modal verbs *may* is the first commonly used epistemic resource in linguistics corpora, which confirms its significance for mitigating the research claims in thesis/dissertations academic discourse (Hyland 1998). According to Flottum et al. (2008: 28) *may* is known to be a “typical and dominant marker of epistemic modality”. It was further added that “by choosing epistemic *may* the writer presents the content of his or her proposition as possibly true”.

Besides, the analysis of data has revealed subtle differences in the pragmatics of each corpus. The linguistics dissertation recorded the highest frequency of modal verbs *may* (16.44) and most of them expressed the weakened prediction and interpretation of results such as in the 1st and 2nd examples. Some have been used to speculate the cause mostly through the structure *may + be + due + to* as in the 3rd example which was not found in the corpus of literature dissertation.

1. The use of fewer words WPM **may** mean that the speaker wants to avoid a breach and not to deliver extra information
R5Ling.txt
2. Thus one **may** assume that according to Levinson speaker's speech may be analyzed

in terms of different kinds of utterances during conversation R7Ling.txt

3. Failure on the part of students to retrieve the given information **may** be due to lack of sufficient dictionary skills R3Ling.txt

Concerning the *will* and *would*, both modal verbs are quite commonly used as EMMs in academic discourse (Biber et al., 1990). Lakoff (1990) categorizes *will* among English modals and considers it as a modal showing the highest degree of certainty. Linguists express that in many languages, future tense markers also work as models that pass on the implication of intention, volition, and suppositions (Lyons, 1977). However, through contextual analysis, the epistemic use of *will* was only obtained. Likewise *would* is considered the tentative epistemic marker (Nugula 2015). The analysis of both the modal suggests that the researchers/writers of both disciplines tend to use tentative form *would* as an epistemic marker more often than the forceful *will*, even though the corpus of linguistics was heavier on epistemic modal verbs. Generally, when the modal verb *would* is employed in an epistemic sense by writers, it represents them to be more polite and tactful towards their claims. According to Collins (2009), *would* compared to *will* in the epistemic sense is “less assured and forthright” and is mostly used to mitigate the speaker’s level of confidence in the certainty of the proposition.

The given instances exemplify the tentative epistemic use of the modal verb in both disciplines.

1. All of this would affect the linguistic concepts linked with these issues and it is expected that our reformed understanding would change the way we use natural language in future. R5Ling.txt
2. On the basis of the close reading of his work, it would be appropriate to hold that he was able to raise such a strong protest against colonialism only because he chose to write in the tradition of magical realism. R5Lit.txt

Whereas, the modal verb *will* convey a prediction that is more direct and strong, through which a writer expresses great confidence in their knowledge and evidence put in their claims. Collins (2009) in his study has compared the force of *will* to the force of *must*. Typical examples of epistemic modals *will* are given below.

1. This widening of the turning textual gyre will produce enabling ideas R8Lit.txt
2. Hence the hegemony of the native speakers will be disturbed and the ELT industry of these countries will be declined R6Ling.txt

The careful scrutiny of the occurrences of epistemic modal verbs *may* brought my attention to the most common phraseology or lexical co-occurrence observed in both corpora which are given below with examples.

1. *may + (also) + be + VIII*
 - i. Her contentions may also be taken in another way that the marginalised group cannot record their resistance and they have no access to a dominant language which can be heard R3Lit.txt
 - ii. English language term such sentences as ungrammatical although they may be accepted in the register-specific language variety of text messages R4Ling.txt
 - iii. Other personal pronouns like *You* and *We* may also be omitted but comparatively in fewer numbers. In the same way, sometimes first and second-person pronouns in the objective case are also omitted. RLing.txt

Passivization is the common syntactic structure employed in academic discourse, particularly in research write up (Haseeb, 2015). Based on the findings, it is assumed that the scholars of both groups have prevalently used the said structure.

2. *will/would + also + help*
 - i. The awareness of these features will help to build a national identity. R6Ling.txt

- ii. The acceptance of these attributes of human speech acts would help computer systems to be more sensitive to communication acts and to appear less machine-like and more human-like. R5Ling.txt
- iii. Subsequently, through an analysis of the use of realist conventions in the selected novels, this research will clarify that the use of realist modality is inevitable for the theme of divorce for this issue carries material domestic and social consequences. R1Lit.txt

The given structure with a *will* has equal evidence in both corpora. But interestingly *would* with *help* is found to have no hits in the corpus of literature, whereas, the said structure has frequently been used by the scholar of linguistics. Based on the given shreds of evidence, it can be assumed that the scholar of linguistics tends to predict equally through hedging device *would* and boosting device *will* wherever it is deemed appropriate.

Furthermore, *shall* is surprisingly found to be the least used modal verb in both corpora. *Shall* with epistemic meaning is employed only 2 times in the corpus of linguistics dissertations and 10 times in the whole corpus of literature dissertations.

Conclusion

Traditionally, research writings were marked as impersonal, neutral, and objective work. However, recent studies on research writings suggest that research reports are dialogues between writers and readers in the research discourse community. This, interactive dimension of different discourses, is particularly dealt with in epistemic modality in linguistics. Linguistic items prototypically used for expressing epistemic modality are deployed from modal auxiliary verbs, lexical verbs, adverbs, nouns and adjectives. The present study identifies and analyzes the epistemic modal verbs

EMVs in the dissertations of linguistics and literature. As the research was corpus-based and intended to obtain frequencies of EMVs, it was deemed important to follow the Empiricist Research Paradigm and to work through quantitative methods.

The result of the study highlights the presence of interpersonal and interactive elements in the dissertations of literature and Linguistics in particular and in academic discourse in general. As far as the comparative frequency across both the discipline is concerned the result obtained from the analysis indicates that researchers in the fields of linguistics tend to employ epistemic modal verbs more than the researchers of pure literature.

The most frequent epistemic modal auxiliaries used in both disciplines were found to be *may*, *would* and *could*. Interestingly, the EMVs were deployed by the researchers of linguistics more than twice as much used by the researchers of literature. The contracted form of each Modal Verbs *won't*, *wouldn't*, etc. was part of the study. Noticeably, they are found missing in both corpora as they are mostly used in spoken discourse as compared to written discourse (Biber et al. 1999).

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