Applications of Language Studies
jals.hmu.ac.ir

An Investigation of the Use of Boosters and Hedges in the Introduction Section of JCR Medical Research Articles

Ali Shafaei[1], Asrin Hosseini[2]

1. Assistant Professor, English Language Department, Bou. C., Islamic Azad University, Boukan, Iran
shafaeiali64@gmail.com (corresponding author)

2. MA, English Language Department, Bou. C., Islamic Azad University, Boukan, Iran
asrnhoseini1992@gmail.com

Abstract

The present research study examined the distribution of metadiscourse markers, i.e., boosters and hedges, in the introduction section of Journal Citation Reports (JCR) medical research articles. To this end, 30 research articles published in the field of medicine between 2018 and 2024 were chosen on the basis of purposive sampling. Then, the introduction sections of the selected articles were taken into consideration with respect to hedges and boosters. They were analyzed in accordance with Hyland's (1998) hedge and booster taxonomy. The results of the data analysis revealed that the most frequently utilized kinds of hedges in the corpus consisted of adjectival, adverbial, and nominal modal phrases, modal auxiliary verbs, approximators of degree, quantity, time and frequency, modal lexical verbs, if clauses, introductory phrases, and complex hedges, respectively. In addition, the results of the chi-square test indicated no significant difference between the frequency of hedges and boosters in the introduction section of medical articles.

Keywords: Discourse, JCR articles, Medical research articles, Metadiscourse, Metadiscourse markers

Citation: Shafaei, A., & Hosseini, A. (2026). An investigation of the use of boosters and hedges in the introduction section of JCR medical research articles. *Applications of Language Studies*, *4*(1), 114–135. https://doi.org/10.22034/jals.2025.2049999.1063

Received: 2025-03-26
Revised: 2025-11-08
Accepted: 2025-12-05
Published online: 2025-12-06

P-ISSN: 2588-6975
E-ISSN: 2588-6983
Article type: Research Paper
DOI: https://doi.org/10.22034/jals.2025.2049999.1063

1. Introduction

Harris (1959) introduced the notion of metadiscourse. Metadiscourse, as Hyland (2005) asserts, provides "a way of understanding language in use, representing a writer's or speaker's attempts to guide a receiver's perception of a text" (p. 3). According to Hyland (2005), metadiscourse markers are employed as an umbrella to organize the text, engage and signal the readers' attitude for both material and audience. Indeed, writers employ metadiscourse markers to convey their credibility and personality as well as the relationship with material and audience in their text. Also, as Crismore (1993) argues, writers are able to demonstrate the vital role of the words in a text by means of certain types of metadiscourse markers. They can use metadiscourse devices to show how the words can act as speech acts, interact with the reader to convey the writer's attitude (Crismore, 1993). Hyland (2005) proposed an interactional model consisting of two dimensions, namely stance and engagement. Stance is the way writers express their ideas in their writing, underlying their authority in an argument and/or denying involvement in the other. Stance is attitudinal, and as the name implies, it manifests how writers project their attitudes towards a proposition (Hyland, 2005). Engagement, as Hyland (2005) puts it, is more reader-oriented. It is the way writers rhetorically appreciate readers and negotiate with them as a discourse counterpart to enlist their support and mitigate the potential of reader objection to their claims. Each of these two dimensions comprises subcategories, which are distinguished by specific rhetorical tools, namely, words and punctuation marks.

In the literature, various kinds of metadiscourse markers like attitude markers, self-mention, and modality markers have gained much attention (Hyland, 2004, 2005; Vassileva, 1997). Among them, as Hyland (1999) states, modality markers such as boosters and hedges constitute "one of the most important features of academic discourse" (p. 179). In general, as Hyland (2004) asserts, hedges and boosters as significant interpersonal metadiscourse indicators assist "the rhetorical expression of the relationship between writer and reader" (p. 87). Boosters and hedges are tools which are utilized to boost or decrease the force of arguments. In accordance with Hyland (2004), boosters are employed to express "conviction or the significance of the work," and hedges are employed to "move away from what can be safely assumed or experimentally demonstrated" (p. 101).

Becoming a good writer is an intricate and continuous process that requires acquiring some essential skills. According to Donadio and Passarieloo (2022), English language learners should encounter the target language, i.e., English, so as to gain more ability to convey their opinions coherently, be able to indicate their position in their written text influentially, and produce a text which conforms to the rules and principles of academic writing. Considering the importance of scientific contribution in the modern world and its personal value for Iranian researchers, especially within the field of medical sciences, it is important to discover the distribution of metadiscourse markers within high-quality research articles (RAs) published recently to explore the pattern of using these fundamental linguistic features in expressing thoughts in RAs (Sarkhosh & Farrokheslamloo, 2020). In addition, as Wang and Zeng (2021) put forth, when authors use specific metadiscoursal strategies to clarify their stance, they try to persuade their readers. Hedges and boosters are among the metadiscoursal strategies that writers employ when they try to establish their viewpoints in their writings. Besides, the RAs written by writers of different disciplines have been investigated by different researchers regarding the employment of metadiscourse indicators. Previous studies have focused on examining the use of hedges and boosters in different disciplines and other sections of the articles such as discussion (Akman & Karahan, 2023; Al-Zarieni & Alkhresheh, 2024; Donadio & Passariello, 2022; Ekoç Özçelik, 2023; Noorian & Biria, 2010; Shen & Tao, 2021). However, the RAs written in the field of medical sciences have been among the rarely investigated research RAs regarding the employment of boosters and hedges. Moreover, the use of boosters and hedges in the introduction section of medical RAs has not been explored in the literature. Thus, the present research was set to explore the distribution of metadiscourse markers (boosters and hedges) utilized by the writers of medical articles in their written texts in the introduction section of their JCR RAs.

There is controversy in the results of the studies conducted on the employment of hedges and boosters by writers of English. The objective of the current study was to investigate the application of epistemic modality markers (boosters and hedges) by academic writers in the introduction of JCR medical articles. In addition, it intended to explore the extent to which they employ hedges and boosters and justify the potential reasons that could have led them to such epistemic choices in their English writing.

Based on the above-mentioned issues and ideas, the following research questions were posed:

RQ1**:** What kinds of hedges are employed by the authors of medical articles in the introduction section of their JCR papers?

RQ2**:** What kinds of boosters are employed by the authors of medical articles in the introduction section of their JCR papers?

RQ3**:** Is there a significant difference between the use of hedges and boosters by the authors of medical articles in the introduction section of their JCR papers?

The essential role of hedges and boosters in academic writing and papers is well-substantiated in different research studies (Hyland, 2005; McGrath & Kuteeva, 2012; Noorian & Biria, 2010; Shen & Tao, 2021; Tan & Eng, 2014; Wang & Zeng, 2021; Geng & Wei, 2023). Furthermore, the significance of this study becomes manifest in the case of the applicability of its findings to non-native students majoring in medical sciences in order to be successful RA writers for prestigious journals. In another perspective, the investigation of hedging/boosting devices seems quite important because such kinds of devices have multiple objectives, providing the authors and researchers with opportunities to express their opinions, claims and statements with precision and cautiousness. Such kinds of devices are also helpful in expressing epistemic modality, mitigating "the force of an utterance for the sake of politeness" (Holmes, 1995, p. 185) and withholding "commitment and open dialogue" (Hyland, 2005, p. 49). In addition, the findings of this research may be of great help for English for specific purposes (ESP) teachers conducting EAP (English for academic purposes) writing courses for the students of medicine and also the syllabus designers as well as material developers interested in compiling materials for the students of medical sciences interested in writing research papers in English. The present study may be innovative in that the medical JCR papers, as high-quality research papers, have not been rigorously researched so far. In addition, unlike many previous studies, the research focuses on a very specific section of RAs, that is, the introduction section.

2. Literature Review

2.1. Metadiscourse

Metadiscourse, according to Hyland (1998), is "the aspects of a text which explicitly organize the discourse, engage the audience and signal the writer's attitude" (p. 23). Also, as Hyland and Tse (2004) assert, metadiscourse points "to the ways writers communicate with their readers through a certain discourse in order to show their stance toward both the content and the audience of the text" (p. 159). In addition, Hyland (2005) argues that writing is a social practice since both authors and readers are involved in the creation of a written text. Therefore, metadiscourse is considered a pragmatic tool which helps authors build meanings and affect audiences' understanding of the text as well as their view of its content (Hyland, 2005). Also, according to Schiffrin (1980), metadiscourse is a linguistic tool that helps authors "bracket the discourse organization and the expressive implications of what is being said" (p. 231). Furthermore, as Hyland and Tse (2004) state, metadiscourse is "an aspect of language which provides a link between texts and disciplinary culture, helping to define the rhetorical context by revealing some of the expectations and understandings of the audience for whom a text was written" (p. 177).

Besides, a model of academic metadiscourse was introduced by Hyland and Tse (2004). Their model is based on interactive and interactional sources. As they state, interactive sources include the signal sequences, topic changes, and connection of ideas to organize the discourse. Interactional resources encompass the authors' reactions to the written work by means of emphatics, hedges, and self-reflections (Hyland & Tse, 2004). They also argue that metadiscourse refers to "the writer's reference to the text, the writer, or the reader that enables the analyst to see how the writer chooses to handle interpretive processes as opposed to statements relating to the world" (p. 167). Moreover, Hyland (1998) proposed a taxonomy of functions of metadiscourse. His taxonomy includes two categories: textual and interpersonal metadiscourse. The taxonomy is presented in Table 1.

In accordance with the table, textual metadiscourse includes tools which demonstrate an argument and help make sense of the author's goals. They help authors to plan their written text in a way to predict the audience's knowledge and demonstrate what the author supposes

to be suitable to express explicitly (Hyland 1998; Hyland & Tse, 2004). Interpersonal metadiscourse helps readers interpret writers' viewpoints alongside the propositional information. It also helps establish an author-reader connection (Hyland, 1998; Hyland & Tse, 2004).

Table 1

Functions of Metadiscourse in Academic Texts (Hyland 1998, p. 442)

Categories	Functions	Examples
	Textual metadiscourse	
Logical connectives	express semantic relation between main clauses	*in addition, but, therefore, thus, and,* etc.
Frame Markers	refer to discourse acts or text in an explicit way	*finally, to repeat, our aim here, we try,* etc.
Endophoric Markers	refer to information in other parts of the text	*noted above, see Fig 1, Table 2, below*, etc.
Evidentials	refer to source of information from other texts	*according to X/Y (1990), Z states,* etc.
Code glosses	help readers grasp meanings of ideational material	*namely, e.g., in other words, such as,* etc.
	Interpersonal metadiscourse	
Hedges	withhold writers' full commitment to statements	*might, perhaps, it is possible, about,* etc.
Emphatics	emphasize force or writers' certainty in message	*in fact, definitely, it is clear, obvious,* etc.
Attitude Markers	express writers' attitude to propositional content	*surprisingly, I agree, X claims,* etc.
Relational Markers	refer to or build relationship with readers in an explicit way	*frankly, note that, you can see,* etc.
Person Markers	refer explicitly to authors	*I, we, my, mine, our*, etc.

2.2. Stance

The notion of stance has its roots in the concept of evidentiality introduced by Gray and Biber (2009). In accordance with Gray and Biber (2009), evidentiality pertains to "understanding the source of information and the assessment of its reliability" (p.19). Also, as Chafe and Nichols (1986) assert, evidentiality includes different modes like expectation, belief, and deduction. They argue that all of these modes can be realized by the linguistic techniques which authors and readers employ to discover the correctness of a statement (Chafe & Nichols, 1986). Moreover, according to Biber and Finegan (1989), stance is concerned with "how speakers and writers evaluate knowledge and how affect is realized via linguistic tools" (p. 6). Later, Biber and Finegan (1989) divided their concept of stance into two categories: evidential and affective markings. They hold that evidential stance deals with the level of sureness of a statement, whereas affective stance is concerned with views demonstrated to an expression. Hyland (2005), in his interaction model, explains stance as "an attitudinal dimension that includes features which refer to the ways writers present themselves and convey their judgments, opinions, and commitments" (p. 176). In accordance with Hyland (2005), stance includes four major features:

> (1) Hedges, (2) Boosters, (3) Attitude markers, and (4) Self-mentions. *Hedges* are words such as *would, could,* and *possible*, which emphasize that a statement is presented based on a writer's interpretation rather than a fact. They are used to indicate tentativeness in communication and lessen the degree of confidence and precision that the writers prefer to convey. (p. 38)

2.3. Related Studies

Akbas and Hardman (2018) examined the characteristics of the discussion section of the written texts created by Turkish, English, and Turkish speakers of English. They reported significant differences among the groups with regard to their uses of stance markers. Sepehri et al. (2019) investigated the use of hedges and boosters in RAs in the fields of engineering and medical sciences. They found a meaningful difference between the frequency of hedges and boosters in medical sciences and engineering papers. Sarkhosh and Farokheslamloo (2020) explored the kinds of hedges and boosters employed in 60 Iranian and foreign academic medical and English

language teaching papers. The results of their study revealed a meaningful distinction in the employment of hedges. However, they reported no meaningful distinction in the employment of boosters. Liu and Tseng (2021) examined the use of hedges and boosters in the discussion of 30 research papers in the field of education. They reported significant differences between the employment of metadiscourse markers in the discussion of these papers. Rezaei Keramati et al. (2019) explored a corpus of 4.3 million terms extracted from three major applied linguistics journals so as to track the diachronic development of stance markers of papers. They reported a meaningful decrease in the frequency of stance markers. Donadio and Passariello (2022) examined the frequency of hedges and boosters in scientific articles from a cross-cultural viewpoint. They compared English and Italian RAs to explore the employment of hedges and boosters. They also aimed to investigate the possible differences between the employment of hedges and boosters in both languages in terms of frequencies and functions. Their findings indicated that targeting an international audience dramatically increased the frequency of the hedges. Akman and Karahan (2023) compared the employment of hedges and boosters in English Language Teaching and Physiotherapy papers. They examined the discussion sections of 15 RAs from each discipline. They found that in both disciplines, the employment of hedges was more than boosters. They also reported distinctions in the employment of hedges between the two fields. However, they reported that the use of boosters was not significantly different between the two fields of study. Ekoç Özçelik (2023) investigated the hedging and boosting techniques in the abstracts of papers of Turkish and Chinese authors. The results did not show meaningful distinction in the frequency of hedges. Ranjbar et al. (2023) investigated the frequency of hedges and boosters in academic written texts of Persian and English authors. The results revealed a meaningful distinction between Persian and English authors. Al-Zarieni and Alkhresheh (2024) explored the use of stance indicators in the abstracts of M.A. theses in the field of linguistics. They found a meaningful distinction between the employment of hedges and boosters.

3. Method

3.1. Research Design

The research was a descriptive-qualitative design in nature to investigate the kinds of hedges and boosters utilized by the writers of medical articles in the introduction section of their JCR papers. In fact, the current research utilized a corpus-driven perspective to analyze features of discourse, namely hedges and boosters quantitatively.

3.2. Corpus

The present research study explored 30 (n=30) introduction sections taken from medical RAs written in English. The RAs were chosen on the basis of purposive sampling. Three criteria were used to include the corpus. First, the articles were selected from among articles published in JCR journals such as Journal of Medicine, New England Journal of Medicine, Nature Medicine, Academic Emergency Medicine, Acimed, Medical Education, and The Lancet, in the field of medicine in JCR RAs. Second, the selection of the articles was limited to those published within these years. To this end, the articles published from 2018 to 2024 were selected. Third, the articles with a separate section as *Introduction* were selected. In some articles, the introduction section was integrated with other sections such as the literature review. Thus, such articles were excluded. To access a pool of introduction sections, the PDF versions of the articles were downloaded from the journal home pages. Care was taken to obtain as many recent RAs as possible. The reliability of the corpus chosen was calculated through inter-rater (82.3) and intra-rater (74.0), which shows that the corpus chosen was reliable and suitable for the objectives of this research. Considering that the value of intra-rater reliability (74.0) was rather low, the corpus was reexamined by the researchers to ensure that all the items included in the corpus were all related to the aims of the study and no redundant items were included in it.

3.3. Research Instrument

In this study, the kinds of hedges and boosters were recognized in accordance with Hyland's model (1998). The model involves two kinds of metadiscourse markers as textual and interpersonal categories. Textual categories involve five subcategories as code glosses, frame markers, evidentials, endophoric markers, and transitions. Interactional categories consist of self-mentions, hedges, attitude markers, boosters, and engagement markers. As Hyland (1998, 2004) puts it, hedges are markers which show the superficial involvement of the author with

the sentences; *for instance, possible, some, would, could, perhaps, etc*. Boosters are features indicating writers' emphasis and certainty, such as *definitely, must, in fact*. The different types of hedges according to Hyland (1998) are presented in Table 2. Table 3 includes the different kinds of boosters in accordance with Hyland (1998).

Table 2

Type of Hedges

	Type
1	Modal auxiliary verbs
2	Modal lexical verbs
3	Adjectival, adverbial, and nominal modal phrases
4	Approximators of degree, quantity, frequency and time
5	Introductory phrase
6	If clauses
7	Compound/complex hedges

Table 3

Type of Boosters

	Type
1	Universal & negative pronouns
2	Amplifiers
3	Emphatics

3.4. Data Collection Procedure

To conduct the study, 30 RAs published in the field of medicine were selected based on purposive sampling. The RAs were chosen from journals indexed in the Social Sciences Citation Index (SSCI) (ISI Web of Science) to minimize unexplained variation occurring because of the quality of journals and authors' English language proficiency. A time span between 2018 and 2024 was set so as to limit the outcome to a feasible extent. Then, in this research study, the introduction sections of the RAs were taken into consideration with respect to boosters and hedges to investigate their occurrence in the published articles. It should be noted that the size of the sample allowed for a deep textual analysis and offered authentic instances for educational aims. Indeed, the study was conducted in two phases. First, the

selected boosters and hedges from the introduction of the papers were turned into text files to feed into the software. After that, the percentages and frequency of boosters and hedges were calculated by the SPSS software, and all the instances in the corpus were identified. It should be noted that two language experts were requested to review the corpus to confirm the reliability and validity of the data. Next, inter-rater reliability was run for the identification of the hedging and boosters.

3.5. Data Analysis

Data analysis included the calculation of the frequency and percentages of hedges and boosters occurring in the corpus. Then, descriptive statistics and tabulation were utilized. In addition to the descriptive statistics, inferential statistics, including chi-square, were used to analyze the obtained data.

4. Results

The results of the data analysis are presented in the following sections.

4.1. Estimating the Reliability

For the objectives of the present research, both inter-rater and intra-rater reliability were computed. Table 4 reports the results. As presented in Table 4, both inter-rater (82.3) and intra-rater (74.0) indices of reliability of the corpus were acceptable to be utilized for the purpose of the study.

Table 4

Reliability results

Reliability	r (%)
Inter-rater	82.3
Intra-rater	74.0

4.2. Answer to the Research Questions

4.2.1. Answer to the first RQ

The first RQ was concerned with the types of hedges utilized by the writers of medical articles in the introduction section of their JCR papers. To this end, the frequency and percentage of hedge types were calculated and reported in Table 5.

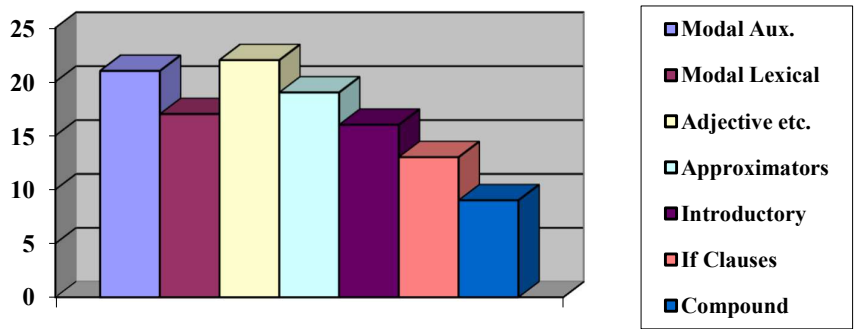
Table 5

Frequency and Percentage of Hedge Types

	Hedge Type	Frequency	Percentage
1	Modal auxiliary verbs	21	17.9
2	Modal lexical verbs	17	14.5
3	Adjectival, adverbial, and nominal modal phrases	22	18.8
4	Approximators of degree, quantity, frequency and time	19	16.2
5	Introductory phrase	16	13.6
6	If clauses	13	11.1
7	Compound/complex hedges	9	7.6
	Total	117	100

Figure 1

Hedge Types in the Introduction Section of Medical Articles



According to Table 5, mostly recurring hedge kinds in the corpus include adjectival, adverbial, and nominal modal phrase (n=22; 18.8), modal auxiliary verbs (n=21; 17.9), approximators of degree, quantity, frequency and time (n=19; 16.2), modal lexical verbs (n=17; 14.5), introductory phrase (n=16; 13.6), if clauses (n=13; 11.1), and compound/complex hedges (n=9; 7.6), respectively. The results are also illustrated in Figure 1.

4.2.2. Answer to the Second Research Question

The second RQ deals with the booster kinds utilized by the writers of medical papers in the introduction section of their JCR papers. To answer this question, the percentage and frequency of the boosters in the corpus were obtained. Table 6 shows the results.

Table 6

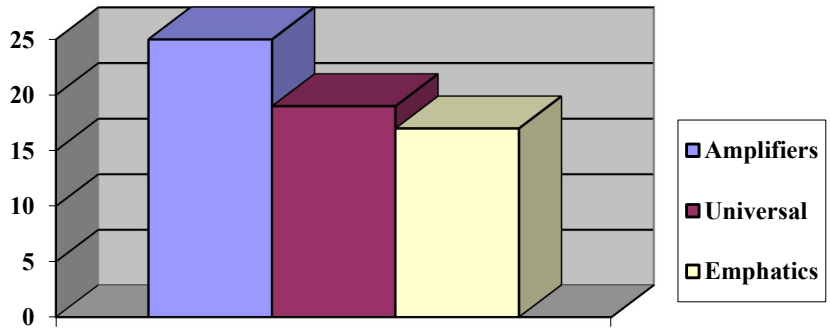
Frequency and Percentage of Booster Types

	Booster Type	Frequency	Percentage
1	Universal & negative pronouns	19	31.1
2	Amplifiers	25	40.9
3	Emphatics	17	27.8
	Total	61	100

As illustrated in Table 6, the most frequent boosters are *amplifiers* (n=25; 40.9), *universal and negative pronouns* (n=19; 31.1), and *emphatics* (n=17; 27.8). Figure 2 also includes the results.

Figure 2

Booster Types in the Introduction Section of Medical Articles



4.2.3. Answer to the third research question

Finally, the difference between boosters and hedges in the corpus was calculated via a chi-square. Table 7 presents the results. Table 7 shows that there was no meaningful distinction between the employment of hedges and boosters (χ^2 = 14.298, *df* = 1, **p* > .05) in the introduction section of medical articles.

Table 7

Chi-Square Test on Reference-to-Text Metadiscourse

	Chi-Square Value	*df*	*p*
Pearson Chi-Square	14.298[a]	1	0.62
Likelihood Ratio	14.304	1	0.00
Linear-by-Linear Association	11.239	1	0.00
N of Valid Cases	178		

5. Discussion

The present research study aimed to examine the distribution of stance markers (boosters and hedges) employed by the authors of medical articles in the introduction of their JCR RAs. The results revealed that the most frequent hedge types in the corpus consisted of *adjectival, frequency, if clauses*, *adverbial, and nominal modal phrases, approximators of degree, modal auxiliary verbs, modal lexical verbs, introductory phrases, quantity and time,* and *complex hedges,* respectively. In addition, the results indicated that *emphatics, universal & negative pronouns*, and *amplifiers* were the most frequent boosters that authors of medical articles employed in the introduction section of their RAs. It was also found that in the introduction section of the medical RAs, boosters are utilized as rhetorical tools that authors use to assert a generally accepted idea or fact and to provide contrastive ideas to something previously mentioned. Furthermore, the results indicated that there was no meaningful distinction between the frequency of hedges and boosters utilized in the introduction section of the medical articles.

The findings of this research were in agreement with the results of Akman and Karahan (2023), who compared the employment of hedges and boosters in English Language Teaching and Physiotherapy papers. They examined the discussion sections of 15 RAs from each discipline. They reported that the use of boosters was not significantly different between the two fields of study. Ekoç Özçelik (2023) investigated the hedging and boosting techniques in the abstracts of papers of Turkish and Chinese authors. The results did not show meaningful distinction in the frequency of hedges. Furthermore, the findings of this research ran against the results of Akbas and Hardman (2018), who examined the characteristics of the discussion

section of the written texts created by Turkish, English, and Turkish speakers of English. They reported significant differences among the groups with regard to their use of stance markers. Sepehri et al. (2019) investigated the use of hedges and boosters in RAs in the fields of engineering and medical sciences. They found a meaningful difference between the frequency of hedges and boosters in medical sciences and engineering papers. Sarkhosh and Farokheslamloo (2020) explored the kinds of hedges and boosters employed in 60 Iranian and foreign academic medical and English language teaching papers. The results of their study revealed a meaningful distinction in the employment of hedges. Liu and Tseng (2021) examined the use of hedges and boosters in the discussion of 30 research papers in the field of education. They reported significant differences between the employment of metadiscourse markers in the discussion of these papers. Rezaei Keramati et al. (2019) explored a corpus of 4.3 million terms extracted from three major applied linguistics journals so as to track the diachronic development of stance markers of papers. They reported a meaningful decrease in the frequency of stance markers. Donadio and Passariello (2022) examined the frequency of hedges and boosters in scientific articles from a cross-cultural viewpoint. They compared English and Italian RAs to explore the employment of hedges and boosters. They also aimed to investigate the possible differences between the employment of hedges and boosters in both languages in terms of frequencies and functions. Their findings indicated that targeting an international audience dramatically increased the frequency of the hedges. Akman and Karahan (2023) compared the employment of hedges and boosters in English Language Teaching and Physiotherapy papers. They examined the discussion sections of fifteen RAs from each discipline. They found that in both disciplines, the employment of hedges was more than boosters. They also reported distinctions in the employment of hedges between the two fields. Ranjbar et al. (2023) investigated the frequency of hedges and boosters in academic written texts of Persian and English authors. The results revealed a meaningful distinction between Persian and English authors. Al-Zarieni and Alkhresheh (2024) explored the use of stance indicators in the abstracts of M.A. theses in the field of linguistics. They found a meaningful distinction between the employment of hedges and boosters.

The findings of this research study can be attributed to the fact that gaining the capability to write well in another language, e.g., English, is a challenging job since, in order

to write a good and successful text, authors need to manage various language systems. They also need to consider the processes of shaping discourse for a specific purpose (Kroll, 1990). Besides, it is essential to know the writing rules and principles; however, it is not sufficient to produce an effective and coherent written text. Authors must possess a good knowledge of metadiscourse markers of the target language (e.g., English) so as to produce a written text which is acceptable in the specific contexts. In accordance with Hyland (2004), acquiring metadiscourse markers is not only learning some new forms and phrases, but it is also enhancing knowledge about the previously learned forms as well as the knowledge and proficiency about where and when to use metadiscourse markers. According to Hyland (2005), metadiscourse markers act as means of conforming to an established writing style. Therefore, article writers need to use metadiscourse indicators such as boosters and hedges to follow the specific style which is appropriate for their aims and audience. Furthermore, metadiscourse, in accordance with Hyland and Tse (2004), deals with a bond between texts, rhetorical context, and disciplinary culture. Thus, in order to create an acceptable piece of writing for their intended discipline and audience, they make use of metadiscourse tools like hedges and boosters to meet the expectations of their audience, establish the suitable rhetorical context, and follow the cultural norms of their target discipline. In addition, the study of metadiscourse markers draws attention to RA writers and points to the importance of them. In addition, the results of the study indicated no significant difference between the use of hedges and boosters by the writers of medical RAs in the introduction section of their papers. This can be due to the point that they might want to keep the balance in their writing with regard to making claims in the introduction section of their papers. That is, the writers might intend to make both certain and probable claims in the introduction section of their RAs to both meet the criteria of writing an introduction in their discipline, i.e., medicine, and meet the expectations of their target audience. The balanced use of hedges and boosters can also be an indication that the authors of RAs in the field of medicine prefer to open up the possibilities of different positions. That is, they try to provide their readers with wider prospects with regard to their different positions in the text by using hedges and boosters to express diverse degrees of certainty.

6. Conclusion

Metadiscourse markers act as instruments that help authors show their degrees of certainty. Hedges are used as tools for conveying a cautious approach to the statements being made. In contrast, boosters are employed to express a high degree of certainty. As Connor (1996) states, a characteristic of metadiscourse is its comprehensive evaluation of the frequency of communication variables and metadiscourse markers. Moreover, in accordance with Cutting (2005), an acceptable kind of metadiscourse involves all of the language functions and strategies with an equal distribution across a written text. Therefore, article writers, including the writers in the field of medicine, need to gain the knowledge of all sorts of metadiscourse markers to be able to become competent and proficient writers. Also, article writers in the realm of medicine used stance indicators, i.e., boosters and hedges, in the introduction section of their RAs to show whether they were certain or less certain about their claims. In fact, the way authors used metadiscourse indicators in their papers reflected their written texts, i.e., research RAs revealed some facts about their degrees of certainty. However, the usage of the boosters and hedges in the introduction section of medical papers was not meaningfully distinct. This finding indicated that the authors of the examined RAs were cautious about making strong claims in the introduction of their RAs; thus, they made attempts to keep the balance in their writing by using an almost equal number of hedges and boosters.

The findings of the current research can be helpful for ESP and EAP teachers, especially the ones working in the field of medicine. They can apply the results of this research study in their courses to raise their learners' awareness about using metadiscourse markers and their functions in their RAs so that they can enhance the quality of their research RAs. Furthermore, curriculum developers and task designers can utilize the results of the present research study to design courses which helps English language learners and article writers to achieve a deeper knowledge of organizing discourse in their written texts. They can develop models for article writing courses in English so as to aid learners in getting familiar with the uses and misuses of metadiscourse indicators, i.e., boosters and hedges, in RAs in their target discipline. When learners are equipped with the knowledge of the appropriate and accurate employment of

metadiscourse indicators, they can use them correctly in their RAs and produce an excellent and flawless piece of written text.

In addition, the study suffered from some limitations. First, the number of articles was low, which means that the results of this study should be generalized with caution. Second, the study was limited only to the papers published in the field of medicine. Third, the study was confined to the investigation of the use of hedges and boosters in the introduction section of the papers. Finally, only the papers published in JCR journals were included in the study. Also, the present study can be replicated by comparing the use of metadiscourse markers in the introduction section of medical RAs and RAs of other disciplines. This study focused on articles published in JCR journals. Future studies can investigate the use of boosters and hedges in the introduction section of journals indexed in other databases.

Conflict of interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in the present research paper.

References

Akbas, E., & Hardman, J. (2018). Strengthening or weakening claims in academic knowledge construction: A comparative study of hedges and boosters in postgraduate academic writing. *Educational Sciences: Theory and Practice, 18*(4), 831–859. https://doi.org/10.12738/estp.2018.4.0260

Akman, E., & Karahan, P. (2023). Hedges and boosters in academic texts: A comparative study on English language teaching and physiotherapy research articles. *RumeliDE Dil Ve Edebiyat Araştırmaları Dergisi* (32), 1335-1349. https://doi.org/10.29000/rumelide.1252902

Al-Zarieni, M. M., & Alkhresheh, M. M. (2024). Hedges and boosters in the abstract sections of master thesis at Yarmouk University. *International Journal of Linguistics, Literature and Translation*, *7*(1), 199-207. https://doi.org/10.32996/ijllt.2024.7.1.18

Biber, D., & Finegan, E. (1989). Styles of stance in English: Lexical and grammatical marking of evidentiality and affect. *Text, 9*(1), 93-124. https://doi.org/10.1515/text.1.1989.9.1.93

Chafe, W., & Nichols, J. (Eds.). (1986). *Evidentiality: The linguistic coding of epistemology*. Ablex Publishing.

Connor, U. (1996). *Contrastive rhetoric: Cross-cultural aspects of second language writing*. Cambridge University Press.

Crismore, A. (1993). Metadiscourse in popular and professional science discourse. In W. Nash (Ed.), *The writing scholar: Studies in academic discourse* (pp. 118-136). Sage.

Cutting, J. (2005). *Pragmatics and discourse: A resource book for students*. Routledge.

Donadio, P., & Passariello, M. (2022). Hedges and boosters in English and Italian medical research articles: A cross-cultural comparison. *International Journal of Language Studies*, *16*(1), 1-20. http://www.ijls.net/pages/volume/vol16no1.html

Ekoç Özçelik, A. (2023). Hedges and boosters in research article abstracts of Turkish and Chinese scholars. Dil Eğitimi Ve Araştırmaları Dergisi, *9*(1), 150-162. https://doi.org/10.31464/jlere.1057023

Geng, H., & Wei, H. (2023). Metadiscourse markers in abstracts of linguistics and literature research articles from Scopus-indexed journals. *Journal of Modern Languages, 33*(1), 29-49. https://doi.org/10.22452/jml.vol33no1.2

Gray, E. A., & Biber, D. (2009). The effects of essay topics on modal verb uses in L1 and L2 academic writing. *Journal of Pragmatics, 41*(4), 667-683.

Harris, Z. (1959). The transformational model of language structure. *Anthropological Linguistics*, *1*(1), 27-29. http://www.jstor.org/stable/30022172

Holmes, J. (1995). *Women, men and politeness*. Longman. https://doi.org/10.4324/9781315845722

Hyland, K. (1998). Persuasion and context: The pragmatics of academic discourse. *Journal of Pragmatics, 30,* 437-455. https://doi.org/10.1016/S0378-2166(98)00009-5

Hyland, K. (1999). Talking to students: Metadiscourse in introductory course books. *English for Specific Purposes, 18*(1), 3-26. https://doi.org/10.1016/S0889-4906(97)00025-2

Hyland, K. (2004). Disciplinary interactions: Metadiscourse in L2 postgraduate writing. *Journal of Second Language Writing, 13,* 133-151. https://doi.org/10.1016/j.jslw.2004.02.001

Hyland, K. (2005). *Metadiscourse: Exploring interaction in writing*. Continuum.

Hyland, K., & Tse, P. (2004). Metadiscourse in academic writing: A reappraisal. *Applied Linguistics, 25*(2), 156–177. https://doi.org/10.1093/applin/25.2.156

Kroll, B. (Ed.). (1990). *Second language writing: Research insights for the classroom*. Cambridge University Press.

Liu, H., & Tseng, J. (2021). Literacy acts and cultural artifacts: On extensions of English modals. *Journal of Pragmatics, 14*, 413-429.

McGrath, E., & Kuteeva, M. (2012). The role of metadiscourse in persuasion. *Technical Communication, 41*(2), 348-352.

Noorian, E., & Biria, K. (2010). Hedges and boosters in native and non-native library and information and computer science research articles. *3L: Language, Linguistics, Literature, 18*(2), 44–61.

Ranjbar, M., Yazdani, H., Ahmadian, M., & Amerian, M. (2023). On the use of hedges and boosters in different sections of research articles published in national and international journals. *Jordan Journal of Modern Languages & Literatures*, *15*(3), 783–796. https://doi.org/10.47012/jjmll.15.3.2

Rezaei Keramati, S., Kuhi, D., & Saeidi, M. (2019). Cross-sectional diachronic corpus analysis of stance and engagement markers in three leading journals of Applied Linguistics. *Journal of Modern Research in English Language Studies*, *6*(2), 1–25. https://doi.org/10.30479/jmrels.2019.11293.1409

Sarkhosh, M., & Farokheslamloo, N. (2020). Frequency and types of hedges and boosters in academic medical and teaching research articles. *Caspian Journal of Scientometrics, 7*(1), 7–15. https://doi.org/10.22088/cjs.7.1.7

Schiffrin, D. (1980). Metatalk: Organizational and evaluative brackets in discourse. *Sociological Inquiry, 50*(3–4), 199–236.

Sepehri, M., Hajijalili, M., & Namaziandost, E. (2019). Hedges and boosters in medical and engineering research articles: A comparative corpus-based study. *Global Journal of Foreign Language Teaching*, *9*(4), 203–213. https://doi.org/10.18844/gjflt.v9i4.4342

Shen, F., & Tao, E. A. (2021). A contrastive study of metadiscourse markers in research article abstracts across disciplines. *Bulletin of the Transilvania University of Brasov, 5*(4), 17-23.

Tan, H., & Eng, W. B. (2014). Metadiscourse use in the persuasive writing of Malaysian undergraduate students. *English Language Teaching, 7*(7), 26-39. https://doi.org/10.5539/elt.v7n7p26

Vassileva, I. (1997). Hedging in English and Bulgarian academic writing. In A. Duszak (Ed.), *Culture and styles of academic discourse* (pp. 203–221). Mouton de Gruyter.

Wang, E., & Zeng, D. (2021). Beyond modality and hedging: A dialogic view of the language of intersubjective stance. *Text, 23*(2), 2594–2598.