Innovation in Language Testing and Teaching (ILTT)
Volume 2 Issue 1 Year 2026 Pages 72 - 94
E–ISSN : 3110-5483 | DOI: 10.61227
E-mail : iltt.pusmedia@gmail.com
https://journal.pusmedia.com/index.php/ILTT/index

A Comparative Study of Interactional Metadiscourse Markers in Research Article Abstracts: The Case of Discipline and Gender

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Abstract : This study investigated the pattern of interactional metadiscourse markers (IMMs) in research article abstracts in Applied Linguistics and Medicine. It also examined the relationship between gender and the use of these markers in abstracts. The corpus consisted of 400 abstracts published by Elsevier between 2012 and 2013, written by male and female scholars. Using Hyland's (2005) taxonomy, the study analyzed the frequency of boosters, hedges, attitude markers, engagement markers, and self-mentions through both quantitative and qualitative methods. Using Hyland's (2005) taxonomy, the abstracts were examined manually to find any occurrence of IMMs and its sub-categories, including boosters, hedges, attitude markers, engagement markers and self-mentions. Both corpora were analyzed quantitatively and qualitatively; in the quantitative phase of data analysis, the frequency and percentage of occurrence of all the categories were calculated and used to make comparisons between disciplines and genders. The results of chi-square test revealed that a significant difference existed in the use and frequency of these markers in the selected disciplines. The results indicated that the overall distribution of IMMs in the abstract sections of Applied Linguistics articles was higher than in Medicine ones. The quantitative analysis also represented a statistically significant difference in the use of IMMs by male and female abstract writers. In both disciplines, male writers tended to use more IMMs in their writings in comparison to female writers. In the qualitative data analysis, real world representations of IMMs within the study corpora were identified and these markers were distributed almost equally in the abstract sections of the studied disciplines. In all, findings indicated that the overall distribution of IMMs in Applied Linguistics article abstracts was higher than Medicine ones. Yet, in both disciplines, the little use of the self-mentions and engagement markers seemed to imply that writers in general consider hedges, boosters and attitude markers as more useful persuasive resources, when they create their research abstracts. It has some pedagogical implications.

Keywords: Applied Linguistics; Abstracts; Gender; Interactional Metadiscourse Markers; Medicine.

Article info: Submitted : 2026-02-24 | Accepted : 2026-06-08 | Published : 2026-06-08

INTRODUCTION

Metadiscourse refers to the linguistic tools writers use to guide readers through a text while conveying their attitudes and level of involvement. This self-reflective

language helps structure ideas and promote interaction, enabling writers to meet readers' expectations effectively. In academic writing, metadiscourse plays a vital role in ensuring clarity and persuasiveness, influencing how research findings are presented and how authors position themselves in relation to their work and audience (Sadigzade, 2026). Most previous studies have concentrated on analyzing metadiscourse in academic texts, primarily examining verbal elements while overlooking the rich visual resources—such as images, videos, and charts—that are extensively used in real-world communication (Zhu &Wu, 2025).

Moreover, writing academic discourse plays a significant role in producing and distributing knowledge among people and across borders (Jogthong, 2001). Research articles have an important role in academic writing. Through writing research articles, writers attempt to incorporate their claims and argumentations into the disciplinary accordance (Hewings 2006). Information in research articles (RA) is presented on the basis of the philosophy of that related field. The majority of genre studies deal with the rhetorical structures of texts. An important part of rhetorical features of research articles is formed through metadiscourse that is used to make the text persuasive and reader-friendly, and it also helps authors to arrive at audiences (Hyland 2005). Hyland (2005) states that Metadiscourse markers (MM) serve as tools that help guide social interactions and contribute to the construction of knowledge within a discipline. Their use varies across different fields due to the unique features of each discipline.

Moreover, abstract is the most significant section of a research study. This kind of text helps readers learn about the most important aspects of a research study. Due to this cause, the abstract is a device to update the scientific communities (García-Calvo, 2010). Crismore, Markkanen and Steffensen (1993) suggest that because the abstract has been defined as a persuasive text, it would be beneficial to study the metadiscourse used by the writers of abstracts. As Hyland (2005) remarks, interactional metadiscourse elements play a crucial role in contributing new knowledge and making academic claims.

On the other hand, interactional metadiscourse elements pave the way for writers to interact with readers, establish a relationship with them, and convey their propositional meaning. Using IMMs, writers should interfere more into the text to accomplish these purposes. As Hyland (2005) argued, IMMs play a very vital function in contributing new knowledge and making academic claims. Nonetheless, these metadiscourse devices display significant conventional channels of encoding meaning that guide and provide a clearer interpretive situation, representing how authors and audiences interact with each other, involving a culture of communication in their own genre through texts. Respectively, this study assumes that patterning of IMMs may be different between males and females. Thus, this research examines the abstract section of

research articles written by academic writers in the field of Applied Linguistics and Medicine.

With regard to the problems mentioned above, the following major research questions were suggested:

1. How are IMMs patterned in research article abstracts in two disciplines of Applied Linguistics and Medicine?
2. Is there any significant difference in the distribution and functionality of MMs in RA abstracts between Medicine and Applied Linguistics?
3. Does gender play a significant role in the patterning of MMs in RA abstracts in Medicine and Applied Linguistics?

Literature Review

1. Metadiscourse and Disciplinary Differences

English for Academic Purposes (EAP) is closely associated with some concepts of community. It is important to know the ways individuals acquire and deploy the specialized discourse competencies that allow them to legitimate their professional identities and to effectively participate as group members. Disciplinary variation has remained a controversy from both theoretical and empirical perspectives. However, there are some controversies in scholars' views on academic discourse. For instance, Raimes (1991) doubts whether there is fixed and stable construct of academic writings even in one discipline and whether there is such a notion as 'academic discourse' to teach and to learn. However, Halliday (1994) argues that differences in language stem from the distinct functions required by various disciplines. Since each discipline is based on its own theoretical foundations, the discourse within each field has evolved its own unique rhetorical structure.

Hyland (2001) challenges the idea of a single, unified academic discourse, arguing that each discipline has its own understanding of knowledge, research methods, and perspectives on the world. Consequently, examining the practices within individual disciplines leads to more detailed and specific insights. This highlights that disciplines and professions are shaped and sustained by the unique ways their members collectively construct and share their understanding of the world through discourse.

Hyland (2004), in his analysis of metadiscourse across a corpus of 240 doctoral and master's dissertations, examines how academic writers employ language to present their work credibly across different disciplines. He highlights that metadiscourse can reflect the rhetorical and social characteristics unique to specific disciplinary communities. The study indicates that the use of metadiscourse in academic writing varies according to discipline. Hyland categorizes applied linguistics, public administration, and business

studies as "soft" fields, whereas computer science, electrical engineering, and biology are classified as "hard" fields. The result of Hyland's (1998) study indicates that metadiscourse can be seen as a universal phenomenon in academic rhetoric, with about the same overall density of metadiscourse resources (including textual and interpersonal resources) in the four disciplines (microbiology, marketing, astrophysics and applied linguistics) studied. However, there were also differences in their use. The main reason of this difference may be in preferred uses of metadiscourse that might reflect broad areas of intellectual inquiry, knowledge structures and their associated forms of discourse.

2. Abstracts Representing Genre of Studies

The fact that different types of abstracts serve different purposes explains the possibility of different features in the subgenres. Some studies witness an interest in defining these features. Abstracts play an important role in academic and scientific discourse. They represent a shortened form of the paper they report on, and function as the purpose of rapidly describing the purposes, the methods and the results of the study they summarize. Abstracts have the key function of helping the reader to decide on the relevance of the paper for his/her interests, so that it can be deemed worth reading, scanning or discarding. Fartousi (2012) argues that the meta-structure of research abstracts is always patterned in terms of rhetoric and progression. The rhetoric and progression would contribute to a fluent move toward audience persuasion as it is the chiefly potential purpose of persuasive and argumentative writings. Salager-Meyer (1991) examined seventy-seven medical abstracts published from 1987 to 1989 to investigate their rhetorical structure. Applying a "move analysis" methodology, the study found that 48% of the abstracts were "poorly structured," exhibiting deficiencies in their discourse.

Besides, the structure of abstracts from a discipline to another, vary to some extent. Sauper et al. (2008) examined the structure of abstracts of papers in pharmacology, sociology, and Slovenian language and literature published in international and Slovenian scientific periodicals. The study showed the three disciplines have different information content. The identified differences can in part be associated not only with the disciplines but also with the different role of journals and papers in the professional society as well as the differences in perception of the role of abstracts. The results questioned the structure of abstracts required by some publishers and international journals.

METHOD

Corpus of the Study

The corpus of the study included the abstracts of research articles written by scholars in two disciplines: Applied Linguistics and Medicine. It was intended to examine if there is any relationship between Gender and the patterning of Interactional Metadiscourse in the abstract section of research articles. The corpus of the study was extracted from published research papers in Elsevier between 2012 and 2013. So the corpus includes 200 abstracts written in the area of Applied Linguistics: 100 by males and 100 by females and 200 abstracts written in the area of Medicine: 100 by males and 100 by females. The total number of words in the two sections in Applied Linguistics and Medicine were 32,895 and 38,757, respectively. Then the corpus was codified for ease of referencing as follows: AL- M stands for Applied Linguistics- males and AL- F stands for Applied Linguistics- females. So, the corpus of Applied Linguistics is codified from AL-M#1 to AL- M#100 and AL- F#1 to AL- F#100, respectively. For The corpus of Medicine we used the acronym Med-M for Medicine-males and Med-F for Medicine- females. Thus, the corpus of Medicine is codified from Med-M#1 to Med-F#100 and Med-M#1 to Med-F#100, respectively. Then, the corpus of the study was analyzed for the tokens which commonly represent interactional metadiscourse functions in academic writing.

Metadiscourse Categorizations

Various classifications of metadiscourse have been proposed by researchers. Essentially they all cover similar entities classified as metadiscourse in a text, although some scholars study this in specific texts or genres. Moreover, the interactional dimension concerns the ways writers conduct interaction by intruding and commenting on their message. The writer's goal, here, is to make himself explicit and involve readers by allowing them to respond to the text. Simply stated, such a dimension involves the reader in the text. The researcher was to conduct his analysis by the use of the subcategories of this dimension as his tool. They are hedges, boosters, attitude markers, self-mentions and engagement markers. Therefore, the corpus were considered after defining each subcategory for more clarification. Hedges are the writer's reluctance to the proposition as an established fact (Hyland, 2005). They are devices such as “possible”, “might” and “perhaps” which are used to withhold complete commitment to a propositional information. Boosters imply certainty and emphasize the force of a proposition (Hyland & Tse, 2004). Words such as “clearly” and “obviously” allow writers to close down alternatives and head off conflicting views. Attitude markers express the writer's appraisal of propositional information, conveying surprise, obligation, agreement, importance, etc. Words such as “agree”, “prefer”, “unfortunately” and “remarkable” indicate the writer's affective, rather than epistemic attitude to proposition (Hyland &

Tse, 2004). Self- mentions refer to the degree of explicit presence of the author in a text. Items of such a marker are the first person pronouns and possessive adjectives (I, me, mine, exclusive we, our, ours) (Hyland, 2005). And, engagement markers explicitly address readers by focusing their attention or including them as participants in the text through second person pronouns, imperatives and question forms (Hyland, 2005).

Procedure

Following Grabe (1987) and Paltridge (1996), the corpus selection was based on three standards: genre, ESP, and the type of text. Following Swales' (1990), Mauranen's (1993), and Connor's (1996) arguments that RAs act as a genre, the academic RA was chosen to meet the first standard. To meet the second, RAs were just only picked from two disciplines, namely, Applied Linguistics (AL) and Medicine (Med). This study was narrowed down and focused solely on the abstract section of RAs, where writers have the opportunity to represent their articles in a condensed form.

The procedure applied in this study began with the collection of word corpus of the abstract of research articles. All selected articles were sourced from some internationally reputed referred journals published by Elsevier. Therefore, Abstracts of 400 articles published in Elsevier between 2012 and 2013 were chosen, including 200 published articles in Medicine from two groups of scholars: 100 males and 100 females and 200 published papers in Applied Linguistics consisting 100 males and 100 females. The Applied Linguistics research article abstracts came from Language and Linguistics sub-discipline. The medicine research article abstracts which are chosen for the purpose of this study fall into three categories: Anatomy, Cancer and Health Policy.

Having extracted the articles, the researcher converted them into rich text format for further analysis. The whole corpus amounted to words. Then, the whole corpus gathered was searched for all instances of IMMs. Finally, both quantitative and qualitative comparisons were made to find to what extent the patterning of interactional metadiscourse in research article abstracts written in Applied Linguistics differ from that of Medicine .It was also intended to find whether gender play a significant role in the patterning of metadiscourse markers in the abstract of writing research articles on applied linguistics and Medicine.

Prior to this research, to counter the threat of unreliability and misinterpretation in the analysis, and to verify the interpretations, agreement on the method of analysis was reached on 10 percent of data - 40 RA abstracts from the corpus through member verification. The initial analysis was double-checked by an experienced researcher in applied linguistics working independently. The result of this pilot study revealed that the

method of analysis fits very well, therefore no modification needed in the method adopted in this study.

Next, all illustrations were carefully analyzed individually and manually based on the context in which they occur in order to be certain about their functions as metadiscourse. Then, since the quantity of data in each discipline may not the same due to length, the frequency of metadiscourse elements was computed to allow comparison across corpora of unequal sizes. Finally, to scrutinize the statistically significant differences between disciplines and genders in concern, Chi-square tests were run on the data.

Data Analysis

To analyze the data, each group of texts was analyzed on the basis of the five categories of IMMs. After analyzing and calculating, the frequencies of metadiscourse markers used for each of the interpersonal metadiscourse categories were determined. A chi-square test was run to find out any significant differences in the use of metadiscourse markers written by the writers of Medicine in terms of in written English research article abstracts. Then, another Chi-square test was applied to mark the differences in the use of metadiscourse markers written by the writers of applied. Furthermore, a Chi-square test was run to establish if any significant differences between two disciplines.

In addition, the percentage will be compared between male and female in two disciplines. For this reason the chi-square tests will be used to compare the type and amount of metadiscourse used by males and females in their use of interactional metadiscourse in the abstract sections of writing research articles in Applied Linguistics and Medicine.

RESULTS AND DISCUSSION

Results of Quantitative Analysis

1. Word Count Analysis

The first step taken in the analysis of IMMs in the abstract sections of the two disciplines was to run word count to determine the length of the corpus under study.

Table 1.Number of Words Used by Males and Females in Abstract Section of Ras in Both Disciplines

	Males	**Females**	**Total**
Applied Linguistics	16599	16296	**32895**
Medicine	18513	20244	**38757**
Total	35112	36540	**71652**

As it is shown in the table 1, the total number of words in Medicine is 5862 words which is more than that of in Applied Linguistics, meaning that research article in Medicine turns to be lengthier than Applied Linguistics. Moreover, as revealed by this Table, in the field of Medicine, female writers used more words to convince readers about their abstracts.

2. Cross- disciplinary Comparison of Interactional Metadiscourse Markers

In order to present a clearer picture of the metadiscourse elements and their frequency of use in the abstract section of research articles in Applied Linguistics and Medicine, the frequency and percentage of metadiscourse elements in each corpus were calculated and the results are presented in Table 2.

Table 4.2

The Frequency of Metadiscourse Markers in Each discipline

	Applied Linguistics	***Medicine***
	F (%)	**F (%)**
Number of Interactional Metadiscourse Markers	1080(5.33)	862(4.25)
Number of total words	20244	20244

As it is displayed in Table 2, the frequency of IMMs in Applied linguistics is 1081(5.33) whereas this amount in Medicine is 862(4.25) .The frequency counts in Table 2 point out that Applied Linguistic authors use more IMMs (219) than Medicine authors. To compare the data gathered from these groups, the non-parametric statistical test of Chi-square was applied. For analyzing the results by Chi-square test, the Alpha level for statistical significance was set at 0.05. Moreover, the degree of freedom for all comparisons was 1. Also, the obtained chi-square value was greater than the critical value of 3.84 at 1 degree of freedom and 0.05 level of significance which proves that there was a significant difference between Applied Linguistics and Medicine writers in terms of the frequency of occurrence of metadiscourse elements in research article abstracts. Given the results, there is sufficient evidence to conclude that IMMs are differently used according to discipline.

3. Cross disciplinary Comparison of the Subcategories of Interactional Metadiscourse Markers

In the next part of quantitative analysis, the subcategories of IMMs in each discipline were quantified in terms of frequency and percentage values. Moreover, Chi-

square test was carried out to show if any significant difference existed between the distribution of subcategories of IMMs across disciplines and gender.

Table 3 presents the frequency analysis of the subcategories of IMMs in each discipline. It shows that all IMMs were used by the academic research article writers in both disciplines. It also provides the number of occurrences as well as the percentage of each case of interactional metadiscourse identified in the corpus. As it is presented in the Table, Applied Linguistics research article abstracts utilized a greater number of MDMs' subcategories. Amongst analyzed markers, hedges (AL: 19.2%; M: 24.1%) were the most frequent markers employed by both groups of authors and boosters (AL: 14.2%; M: 10.0 %) as the second most. Attitude markers figured out to be the third most frequent features compared with the other two interactional elements, Self-mentions markers (AL: 9.4%; M: 9.2%) and engagement markers(AL: 3.4%; M: 1.9%). However, the amount of utilization of Self-mentions was about the same between two disciplines (AL: 3.8%; M: 4.8%).

Table 3.
Ranked interactional Metadiscourse Categories Based on Total Interpersonal Metadiscourse Percentage

			Discipline		Total
			Applied Linguistics	Medicine	
Interactional Metadiscourse Markers	Hedges	Count	414	416	830
		% within Interactional Metadiscourse Markers	49.9%	50.1%	100.0%
		% within Discipline	19.2%	24.1%	21.4%
		% of Total	10.7%	10.7%	21.4%
	Boosters	Count	307	172	479
		% within Interactional Metadiscourse Markers	64.1%	35.9%	100.0%

		14.2%	10.0%	12.3%
	% within Discipline			
		7.9%	4.4%	12.3%
	% of Total			
	Count	204	159	363
Attitude Markers		56.2%	43.8%	100.0%
	% within Interactional Metadiscourse Markers			
		9.4%	9.2%	9.3%
	% within Discipline			
		5.3%	4.1%	9.3%
	% of Total			
	Count	82	83	165
Self- mention		49.7%	50.3%	100.0%
	% within Interactional Metadiscourse Markers			
		3.8%	4.8%	4.2%
	% within Discipline			
		2.1%	2.1%	4.2%
	% of Total			
	Count	73	32	105
Engagement Markers		69.5%	30.5%	100.0%
	% within Interactional Metadiscourse Markers			
		3.4%	1.9%	2.7%
	% within Discipline			
		1.9%	.8%	2.7%
	% of Total			
	Count	1080	862	1942
Number of Metadiscourse Markers		55.6%	44.4%	100.0%
	% within Interactional			

	Metadiscourse Markers			
	% within Discipline	50.0%	50.0%	50.0%
% of Total		27.8%	22.2%	50.0%
Total	Count	2160	1724	3884
	% within Interactional Metadiscourse Markers	55.6%	44.4%	100.0%
	% within Discipline	100.0%	100.0%	100.0%
	% of Total	55.6%	44.4%	100.0%

Another Chi-square test was run in order to investigate whether or not the differences between two disciplines in terms of the subcategories of IMMs is significant. The obtained Chi-square value was greater than the critical value of 3.84 at 1 degree of freedom and 0.05 level of significance which proves that there exists a significant difference between two disciplines of Applied Linguistics and Medicine considering subcategories.

4. Disciplinary Comparison of the Subcategories of Interactional Metadiscourse Markers

In order to consider the patterning of IMMs in the disciplines of Applied Linguistics and Medicine, the five subcategories were identified in each discipline. Table 4 shows the frequencies and percentages of each subcategory in Applied Linguistics research Article Abstracts.

Table 4.
The Frequencies and Percentages of Subcategories in Applied Linguistics research article abstracts

		Frequency	Percent
Valid	**Hedges**	414	38.3
	Boosters	307	28.4

Attitude Markers	204	18.9
Self- mentions	82	7.6
Engagement Markers	73	6.8
Total	1080	100.0

According to this Table, frequencies and percentages of IMMs in Applied Linguistics is varied. Hedge (38.3%) is at the top and Engagement marker (6.8%) is at the bottom of the table. Booster (28.4%), Attitude Marker (18.9%) and Self-mention (7.6%) are between these two resources, respectively.

For more consideration, a Chi-square test was run in order to find out whether there is a significant difference among the patterning of subcategories within Applied Linguistics research article abstracts. The result of Chi-square revealed that there is a significant difference between the use of hedges, attitude markers, self-mentions and engagement markers. The obtained Chi- square is 1966.98 which is greater than the critical value at the significant level of .000.

5. Frequency of Subcategories in Medicine

The same procedure was carried out for the second discipline i.e. Medicine. Table 5 reveals the Frequencies and Percentages of Subcategories in Medicine research article abstracts.

Table 5.
The Frequencies and Percentages of Subcategories in Medicine research article abstracts

		Frequency	Percent
Valid	**Hedges**	416	48.3
	Boosters	172	20.0
	Attitude Markers	159	18.4
	Self- mentions	83	9.6
	Engagement Markers	32	3.7
	Total	862	100.0

In Medicine, the same as Applied Linguistics, Hedge (48.3%) is at the top and Engagement marker (3.7%) is at the bottom of the table. Booster (20.0%), Attitude Marker (18.4%) and Self-mention (9.6%) are between these two resources, respectively.

For more consideration, a Chi-square test was run in order to find out whether a significant difference exists among the use of subcategories within Medicine research article abstracts. The result of Chi-square (i.e., 6.82.76 which is greater than the critical value) revealed a significant difference between the use of hedges, attitude markers, self-mentions and engagement markers in the abstracts written in the field of Medicine.

4.1.6 Comparison of the Use of Interactional Metadiscourse Markers across gender

Comparing the texts written by males with the ones written by females demonstrate the way gender may affect the metadiscourse markers patterning in the abstract sections of the above- mentioned research articles.

Table 6
The Statistical Analysis of Subcategories of IMMs Across Gender

			Gender		Total
			Females	Males	
Interactional Metadiscourse Markers	Hedges	Count	394	436	830
		% within Interactional Metadiscourse Markers	47.5%	52.5%	100.0%
		% within Gender	23.8%	19.6%	21.4%
		% of Total	10.1%	11.2%	21.4%
	Boosters	Count	210	269	479
		% within Interactional Metadiscourse Markers	43.8%	56.2%	100.0%
		% within Gender	12.7%	12.1%	12.3%
		% of Total	5.4%	6.9%	12.3%
	Attitude Markers	Count	123	240	363
		% within Interactional Metadiscourse Markers	33.9%	66.1%	100.0%
			7.4%	10.8%	9.3%

		% within Gender			
		% of Total	3.2%	6.2%	9.3%
	Self- mention	Count	78	87	165
		% within Interactional Metadiscourse Markers	47.3%	52.7%	100.0%
		% within Gender	4.7%	3.9%	4.2%
		% of Total	2.0%	2.2%	4.2%
	Engagement Markers	Count	24	81	105
		% within Interactional Metadiscourse Markers	22.9%	77.1%	100.0%
		% within Gender	1.4%	3.6%	2.7%
		% of Total	.6%	2.1%	2.7%
	Number of Metadiscourse Markers	Count	829	1113	1942
		% within Interactional Metadiscourse Markers	42.7%	57.3%	100.0%
		% within Gender	50.0%	50.0%	50.0%
% of Total		21.3%	28.7%	50.0%	
Total		Count	1658	2226	3884
		% within Interactional	42.7%	57.3%	100.0%

	Metadiscourse Markers			
	% within Gender	100.0%	100.0%	100.0%
	% of Total	42.7%	57.3%	100.0%

Table 6 reveal that both males and females use mostly hedges (M: 19.6 %; F: 23.8%) and boosters (M: 12.1%; F: 12.7%) in their writings and made the least use of engagement markers (M: 3.6%; F: 1.4%). To see if any statistically significant difference existed in the use of interactional metadiscourse by males and females, a chi-square test was run; the results are illustrated in Table 7.

Table 7
Results of Chi-Square Test on Males and Females' Use of Interactional Metadiscourse

	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	37.813(a)	5	.000
Likelihood Ratio	39.290	5	.000
Linear-by-Linear Association	3.284	1	.070
N of Valid Cases	3884		

a 0 cells (.0%) have expected count less than 5. The minimum expected count is 44.82.

As the table shows, the observed chi-square (37.813) is significant at P level of 0.000 which indicates a significant difference between these two groups in their use IMMs. In other words, the two groups of writers significantly differ in their use of IMMs and their subcategories.

Results of Qualitative Analysis

1. Distribution of Hedges in the Applied Linguistics and Medicine corpora

To Hyland and Tse (2004), hedging devices signal authors' unwillingness to express propositional content categorically. Through such uncertainty markers, writers indicate a well-considered commitment to the truth-value of a proposition. Using certain modal verbs can be one way of expressing uncertainty when they are used to refer to possibility and tentativeness, e.g. *may, might, can, could*. Epistemic verbs may also indicate possibility and tentativeness on the part of the author, e.g. *seem, and appear*. The use of

probability adverbs and adjectives (e.g. *probably, perhaps, maybe, rather*) are yet other ways of expressing uncertainty (Oskouei, 2011). Below are some examples from both sources of data to illustrate the notion of Hedges in the abstract sections of Medicine and Applied Linguistics academic research articles.

This observation suggests that in the hair involucrin mainly participates in the formation of the corneous material of the medulla and inner root sheath in conjunction with trichohyalin, *probably* by the formation of isopeptide-bonds. (Med-M #15)

In the above example *probably* indicates uncertainty.

Uncertainty can also be expressed through the use of epistemic expressions, e.g. *it is likely*, and *the likelihood is that*.Another way of expressing uncertainty is through the use of approximators (e.g. *something around, about, somewhat*). For example:

- The results suggest that students are generally somewhat positive about their use of English punctuation, with some variance in their use of punctuation depending on the writing context at hand. (AL-M #68)

In this example *somewhat* has been used to reflect the uncertainty of the writer. Uncertainty can also be expressed through the use of auxiliary modals like (*may*). For example:

- The role of judges is to apply the law in order to decide disputes. In so doing, they are *often* called upon to interpret statutory and constitutional provisions, and their opinions in such cases *may be* presented as linguistic analyses. (AL- F #54)

In the above example (*may*) indicates uncertainty. The use of the modal verb (can) is another way of expressing uncertainty.

2. Distribution of Boosters in the Applied Linguistics and Medicine corpora

Boosting tools permit writers to close down alternatives and express certainty in what they say, such as: *it is clear that, definitely, obviously*, etc (Hyland, 2005). Certainty of boosters can be expressed through the use of modals as in the following example where *must* is used to indicate the high probability.

When selecting among the many tools available to analyze needs the course designer *must* consider practicality as well as validity and reliability. (AL- M #71)

Adverbs may also be used to indicate certainty, e.g. *certainly*, *surely*. Consider the following examples given below:

- Compliments are *certainly* one of the most widely studied speech acts, as shown by the extensive literature devoted to the topic. (AL- F #59)

Whole phrases or sentences can also be an indication of a high degree of certainty, e.g. the use of *we can be sure* and *no one should doubt*.

- *Results of regression analysis show that* self-salience helps explain the paradoxical patterns of mental health by gender, race, and social class. (Med- F #50)

3. Distribution of Self-mention markers in the Applied Linguistics and Medicine corpora

The strategic application of self-mention in research article writing provides an opportunity for authors to assert their authorial persona by stating their strong beliefs and ideas, putting emphasis on their contribution to the field, as well as seeking recognition for their endeavor (Kuo, 1999). Personalization refers to writers' reference to themselves through personal pronouns of *I* or the exclusive we when referring to the organization they are part of. Following are some examples:

- *I* find that searching for health information on the Internet has a positive, relatively large, and statistically significant effect on an individual's demand for health care. (Med-F #89)
- *Our* results suggest that hairs preserved in coprolites from temperate cave environments can serve as an effective source of ancient DNA. (Med-M #2)

4. Distribution of Attitude markers in the Applied Linguistics and Medicine corpora

These markers show writers' influential, not epistemic, viewpoint and attitude towards propositional content. Attitude markers can be characterized through lexical choices such as attitude verbs (*agree, prefer*), sentence adverbs (*unfortunately, hopefully*), and adjectives (*appropriate, remarkable*) (Hyland 2005).

The following extracts taken from Medicine and Applies Linguistics corpora illustrate the use of attitudinal adverbs or phrases through which the writers expressed their personal feelings.

Starting point is the observation that epistemic must occurs *remarkably* more often in English than its immediate counterparts in the two other languages. (AL- M #71)

- Medicalization studies have changed *dramatically* in the past decade in part due to the increased attention to the role of pharmaceuticals and the pharmaceutical industry in modern life. (Med-F #68)

In the above examples attitude has been expressed thematically using the attitudinal adverb.

4.2.5. Distribution of Engagement markers in the Applied Linguistics and Medicine corpora

Engagement markers can be exemplified through a number of ways like reader pronouns, personal asides, questions, and directives (Hyland 2005). These expressions draw the readers' attention to a specific point in the argument, and are a powerful means of communicating with the readers and persuading them to accept the writer's ideas. The following examples illustrate the use of such expressions:

- The connection between writing and identity has been a subject of academic interest for some time and there is now broad agreement that identity is created from the texts *we* engage in and the semiotic choices *we* make. (AL- M #80)
- A critical appraisal of the history of this issue can help *us* to better understand the tangled relationship(s) between innovation, "cure," death, and the symptoms and subjective experiences of sufferers. (Med-F #69)

Discussion

Interactional metadiscourse features pave the way for writers to interact with readers, get access to them, and signal their truth-value about current propositional information. As for the basic finding of this study regarding similar points in both disciplines, it was noticed that both disciplines made use and took advantages of IMMs and its subcategories explicitly in their research article abstracts, albeit of varying frequencies. Thus, that could mean writers of both disciplines are conscious about the critical significance of the use of IMMs in academic writing.

Results of chi-square test showed that there is a statistically significant difference between applied linguistics and Medicine writers in the use of Boosters. There was not a statistically significant difference between two groups in the use of Hedges. However, Medicine writers use a few more Hedges than applied linguistics authors. Hedges are features which limit the writer's commitment to what is stated in a proposition. Therefore, Medicine authors seem to be more cautious in expressing new findings by using a greater number of hedges.

Furthermore, the number of attitude markers in the applied linguistics corpus was lower than in the Medicine corpus. This means that applied linguistics writers tend to express their attitudes and affective evaluation of propositions less frequently than Medicine writers do. This finding is in agreement with the lower number of hedges and higher number of boosters used by applied linguistics writers.

Also, there was no statistically significant difference between the two groups in the use of self-mentions. This indicates that writers in both disciplines explicitly give reference to themselves. Self-mentions show self-references and self-citations. Results of chi-square test showed that there is a statistically significant difference between applied linguistics and Medicine writers in the use of engagement markers.

Considering the patterning of IMMs in research article abstracts, our results are in line with García-Calvo (2000) who conducted an intercultural and interdisciplinary study of the metadiscourse used in 400 conference abstracts. In order to characterize the patterning of IMMs between two disciplines of Applied Linguistics and Medicine for the first research question, the five subcategories were identified and evaluated in each discipline. Considering applied linguistics, writers made use of hedges more than other subcategories of IMMs. Booster came as the second subcategory. Attitude markers were at the midpoint and self-mentions and engagement markers, respectively, took the last places. The results of the Chi-square test carried among the subcategories of IMMs in this group revealed that IMMs were used differently in this discipline.

As for the next discipline, medicine, the same pattern was used by the writers of research article abstracts. Similar to the writers in Applied Linguistics, Medicine writers made use of hedges more than other subcategories.

Amongst analyzed markers, hedges were the most frequent markers employed by the writers of both disciplines and boosters as the second most. This is in line with Abdi's (2002) findings. In his article, he examined the way through which writers use the Interpersonal Metadiscourse Markers to present their identity in two major academic fields: the social sciences and natural sciences. This finding is also in line with Khedri, Ebrahimi & Heng (2013) who examined IMMs in the academic research article result and discussion sections.

In the case of the second research question, a precise comparison was made between two disciplines. The quantitative results of the study showed that IMMs in Applied Linguistics research article abstracts significantly outnumbered medicine research article abstracts. It reveals that the interactional communication for applied linguistics writers appears to be more important in this community of practice. However, qualitative analysis revealed that both disciplines follow almost similar pattern of IMMs. Both disciplines used hedges more than other subcategories. Boosters took the second place. Attitude markers were at the midpoint and self- mentions and engagement markers, respectively, had the smallest proportions.

Results of frequency analysis identified that elements which carry the meaning of hedges are manifested more or less identically in two disciplines, though a little more in Medicine, (416, 24.1%) tokens while (414, 19.2%) tokens in Applied Linguistics. The similarity between two disciplines can be justified considering the manner of authors in the case of article writing to display that the writers tend to be on the safe side when making claims writing abstracts. Hedges are used more, but not markedly, in the Medicine abstracts than in Applied Linguistics ones. This finding is not in line with those gained by Hyland (2004) and Abdi (2002) where they found that hedges are used more

in soft sciences. In spite of the similarity in applying tentative language, both majors of field were statistically discrepant in the use of boosters. These devices occurred much more in the Applied Linguistics, 307 tokens (14.2%) in Applied Linguistics and 172 tokens (10.0%) in Medicine.

Regarding the third research question, the impact of gender, the researcher examined the differences in the frequency use of IMMs in males and females in research article abstracts. The results indicated a significant difference between these two groups in their use of IMMs. In other words, the two groups of writers significantly differ in their use of IMMs and their subcategories. In both disciplines, male writers tend to use more IMMs in their writings in comparison to female writers. Also, the most focuses of males' and females' use of IMMs in their abstracts is on hedges (M: 19.6 %; F: 23.8%), one of the subcategories of IMMs introduced by Hyland (2005). However, the most use of hedges belongs to males. This overuse of hedging devices on the part of male writers might show more interest in uncertainty. In comparing males and females, all types of Hyland's IMMs is used. The analysis carried out in this study reveals that differences between genders in using MD are present in the overall distribution of IMMs. The analysis of the data revealed that hedges as well as boosters, especially male use of hedges, occupied high positions in the abstract section. Regarding the greater use of engagement markers by males, it might be concluded that males tend to build relationship explicitly with the reader.

The least differences belongs to the use of self- mentions (M: 3.9%; F: 4.7%). Males use it almost the same as females. So, here it can be concluded that among all subcategories of IMMs, self- mentions are the least–sizable inter-gender difference. Moreover, the results of the current study indicated that male writers utilized a higher number of IMMs than female writers. It confirmed the view that writing differences are gender-specific, so the results are in line with Tse and Hyland (2008). But the results are not in line with Yavari and Kashani (2012) study which indicated that, with respect to interactional features, there were no significant gender-based differences in the overall distribution of interpersonal resources.

CONCLUSION

Because the writers of the abstracts used all of the categories of IMMs analyzed in this study, the results of this study seem to support the idea that the use of IMMs is common in abstracts for scientific events. It is interesting that both disciplines follow similar pattern in the use of IMMs. In both disciplines, writers made use of hedges more than other subcategories of IMMs. Next in rank were boosters followed by attitude markers. In both disciplines, the little use of the self-mentions and engagement markers

seems to imply that writers in general consider hedges, boosters and attitude markers as more useful persuasive resources when they create their research abstracts. The low frequency of the self-mentions and engagement markers in the texts can have several possible explanations. With regard to the use of self-mentions, the authors seemed to have the natural tendency to use passive structures in their abstracts. It means they refrain from utilizing the self-mentions in their research abstracts.

With regard to gender, the quantitative analysis shows that there is a significant difference between male and females in using the IMMs. Males tend to use all the IMMs more frequently than females which reveals that the interactional communication for them is more important in this community of practice. However, qualitatively, some similarities can be observed in their use of IMMs. That is both males and females made use of IMMs in the same pattern. They use hedges more than other subcategories. Boosters took the second place. Attitude markers were at the midpoint and self- mentions and engagement markers, respectively, enjoyed the smallest proportions. The results of this study have several pedagogical implications. Therefore, the empirical findings of this study may be useful for teachers and students learning English. Furthermore, the material designers can use the findings of this study to develop materials which reflect the natural frequency and function of Metadiscourse Markers in their work. There is no claim that this study is comprehensive and therefore it had some limitations. Nevertheless, the findings from this study could form the basis for further research.

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