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SPECIAL ISSUE:
Teaching English as a Foreign Language

Subdisciplinary and Paradigmatic Impact of Metadiscourse Markers in Medical research Articles

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Abstract

As the overriding components of discourse, metadiscourse markers (MDMs) have been studied extensively through varying disciplines and paradigms and in different languages/cultures. However, when it comes to subdisciplinary realization of these features, particularly in medicine, we have to seemingly pave a long way. Identifying this gap, the present corpus-based study which is inspired by the metadiscourse taxonomy of Hyland (2005), focuses on exploration of 180 Medical Physics and Nursing research articles (RAs) as two rather distinct but comparable subfields of medicine across the quantitative and qualitative paradigms in English. It is expected that the findings will help in heading off the problems of the academic researchers and graduate students in writing RAs.

Keywords: Metdiscourse Markers (MDM), Research Articles (RAs), Medical Physics, Nursing, Native English Writers (NEW), Iranian English Writers (IEW)

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1. Background

Granted that some aspects of college life, i.e., teaching and research are seriously attended to in an educational system, this does not mean that other practices such as the writing skill can be regarded as peripheral in the academic settings. According to Hyland (2011, p. 2), "universities are ABOUT writing and that the specialist forms of academic literacy are at the heart of everything we do: central to constructing knowledge, educating students, and negotiating a professional academic career". Moreover, the expression 'publish or perish' has so vigorously found its way to the heart of universities that students and academics are now highly required to gain the ability to publish and thus bear their names identified in Anglophone journals for their survival and promotion.

It is also important to note that earlier views on language saw texts as largely expository and propositional in that language is used merely for the exchange of information or communication of ideas. To balance, however, the view, Krismore (1989), Vande Kopple (1985), Williams (1981), and some others' pioneering work emerged in literature to touch also upon the significance of the writers or speakers' intrusion into the text in order to impinge on the audience reception of the material. In this way, it was identified that some tokens such as interpersonal resources are also deployed in texts which help writers organize discourse and take attitude towards their readers as well (Hyland, 2004, 2005) and metadiscourse can act as one such resource. Interestingly, Hyland and Tse (2004) see all metadiscourse as interpersonal but with two levels of meaning arising from the perspective that textual features can also highly contribute to the writers' way of connection with and impression on the audience. It follows that taking into account the knowledge and expectations of the interlocutors is now a critical consideration in issues related to metadiscourse use.

Some scholars have also underscored the multifunctionality of metadiscourse attributes (Crismore, Markkanen, & Stefferson, 1993; Hyland, 2005, 2015). They inform us that context of use is a critical factor in determining the function of metadiscourse elements. Put it in another way, the form of a token may in cases fail to easily crystalize its function unless the context in which the token is used is also taken into account. Stipulated by Hyland (2015), "analysis therefore begins by attending to linguistic *forms*, but it regards these forms as expressions of particular discourse-oriented *functions*" (p. 4).

Moreover, it is necessary to draw a dividing line between the employment of MDMs in varying genres: academic writing, business contexts, magazine advertising, company manual reporting and the like. It is because writers normally attempt to pursue different purposes by employing diverse metadiscourse elements so as to materialize their contribution, either widened or narrowed, to the text and impinge on particular audience.

Attested by literature, MDMs have been explored from a variety of taxonomies and approaches. Some studies have dealt with a whole range of MDMs (Akbas, 2012; Faghih & Rahimpour, 2009; Hyland & Tse, 2004; Marandi, 2003; Mostafavi & Tajalli, 2012; Shokouhi & Talati Baghsiahi, 2009) while others have examined certain metadiscourse subcategories (Burneikaitė, 2008; Dahl, 2004; Farrokhi & Ashrafi, 2009; Ghadyani & Tahririan, 2015; Gomez, 2011; Jalilifar, 2011; Tessuto, 2008). In a study conducted by

Hyland (2005), for example, it was shown that the writes' deployment of a quite higher number of hedging attributes (e.g.: might, likely, possibly) in RAs compared with the lower distribution of the token in the textbooks (15.1 *vs.* 8.1 respectively) can instantiate the authors' awareness of the limitations of knowledge and thus the need for withholding certainty while writing RAs; this is, however, not the case in the textbooks.

Several studies have also tapped the possible paradigmatic variation in terms of use and frequency of metadiscourse features. Cao and Hue (2014), for example, compared 120 RAs written by psychologists, educationalists, and applied linguists to identify the distribution interactive metadiscourse signals by these knowledge makers. The results indicated variation in the employment of transitions and evidentials accounted for by the differences between quantitative and qualitative paradigms. In line with this study, Hu and Cao (2015), investigated the interactional metadiscourse frequencies in the disciplines mentioned and once more discerned the differences that could evidently be ascribed to paradigmatic epistemological contrasts. Mozayan and Allami's (2016) inquiry also underscored the importance of quantitative and qualitative differentiation in academic RAs that can contribute to the emergence of some varying results.

In addition, medical research papers have also been investigated for their disciplinary or paradigmatic variations across different languages/cultures. The unresearched niche in this arena, however, is the study of the subdisciplinary conventions of metadiscourse use in the qualitative and quantitative paradigms of medical RAs that triggered the present investigation. More specifically, the present study aims to deal with the following research questions:

1. Are there any significant differences in terms of type and frequency between native English writers (NEW) and Iranian English writers (IEW) in the use of MDMs in post-method section of *quantitative* research articles in the field of Medical Physics?

2. Are there any significant differences in terms of type and frequency between native English writers (NEW) and Iranian English writers (IEW) in the use of MDMs in post-method section of quantitative research articles in the field of Nursing?

3. Are there any significant differences in terms of type and frequency between native English writers (NEW) and Iranian English writers (IEW) in the use of MDMs in post-method section of *qualitative* research articles in the field of Medical Physics?

4. Are there any significant differences in terms of type and frequency between native English writers (NEW) and Iranian English writers (IEW) in the use of MDMs in post-method section of qualitative research articles in the field of Nursing?

2. Method

2.1. Corpus

This corpus-based study included 180 RAs written by the native speakers of English and Persian. The journals out of which the articles were selected had been published between 2010 to 2015. This time span was selected for gaining access to the adequate number of the papers required. After extracting the full-length original articles needed for the study, attempts were made to convert the post-method sections into plain text format by excluding block quotations, tables, figures, footnotes, and references as well as appendices, if any, to provide a better possibility for corpus analysis. The reason for

opting the post-method sections of the papers is that these sections can highly be representatives of the writers' own structuring and wording (Abdi, 2011; Cao & Hu, 2014; Hu & Cao, 2015; Khedri et al., 2013). Therefore, the *introduction* and *method* sections of the papers were dispensed with. Moreover, due to the fact that no study to date has probed into the subdisciplines of medicine in the quantitative and qualitative cross-linguistic paradigms, decision was made to touch upon this knowledge gap.

The study was mostly triggered by the works of Harwood (2006) and Ozturk (2007) who stipulate the need for some *subdisciplinary* comparisons rather than just probing into disciplinary identities. Moreover, granted that several researchers have identified the rhetorical features of medicine to be different from those of other disciplines, yet the dichotomous realization of knowledge domains as hard/soft divide (Becher & Trawler, 2001) remains to be understood in diverse paradigms and subdisciplines of medicine. For this purpose, it was initially necessary to consult the opinion of the professionals in the discipline, the results of which determined the two subfields of Medical Physics and Nursing as the rather distinct and comparable medical representatives of hard and soft sciences. Furthermore, paradigm characterization was developed on the basis of Cresswell's (2009) classification in social and behavioral research.

Knowledge-domain expertise was also needed to help us specify and draw on the academic journals published between the aforementioned years. And the disciplinary professionalism finally oriented us to select the English articles published by such databases as *a*) Scopus. Embase, CINAHL, Biological Abstract, and *b*) Psycho info as this would bring about more homogeneity with the articles listed in Table 1.

Table 1. List of the Journals Used

Subdisciplines	Journals
Medical Physics	Advances in Medical Sciences
Medical Physics	Iranian Journal of Medical Physics
Medical Physics	Iranian Journal of Biomedical Engineering
Medical Physics	Journal of Applied Clinical Medical Physics
Nursing	Journal of Nursing Care Quality
Nursing	Journal of Care Management
Nursing	Iranian Journal of Nursing
Nursing	Iranian Journal of Nursing Research (IJNR)

2.2. Procedure

To classify discourse elements, metadiscourse studies (Crismore *et al.*, 1993; Dafouz, 2003; Hyland, 1998 a, b; Vande Kopple, 1985, among others) have mostly drawn on the Hallidayan distinction between *textual* and *interpersonal* functions of language. The former refers to the organization of the text whereas the latter helps the interlocutor to interpret, evaluate and react to such material. Moreover, of all the

metadiscourse categorizations present in the literature, this study utilized the one organized by Hyland (2005) for the reason that it is highly drawn on by other researchers in the field (illustrated in Table 2).

Table 2. Metadiscourse classification by Hyland (2005: 49), adapted

Category	*Function*	*Example*
Interactive	**Help to guide the reader through the text**	**Resources**
Transitions	express relations between main clauses	in addition; but; thus; and
Frame markers	refer to discourse acts, sequences or stages	finally; to conclude; my purpose is
Endophoric marker	refer to information in other parts of the text	noted above; see figure; in section
Evidentials	refer to information from other texts	according to X; Z states
Code glosses	elaborate propositional meaning	Namely; e.g.; such as; in other wor
Interactional	**Involve the reader in the text**	**Resources**
Hedges	withhold commitment and open dialogue	might; perhaps; possible; about
Boosters	emphasize certainty and close dialogue	in fact; definitely; it is clear that
Attitude markers	express writers' attitude to proposition	unfortunately; I agree; surprisingl
Self-mentions	explicit reference to author(s)	I; we; my; me; our
Engagement marker	explicitly build relationship with reader	consider; note; you can see that

Moreover, to avoid running the risk of misinterpretation of such tokens in the text, the contextual interpretation of the features was subsumed rather than the computerized concordancing techniques. The content validity of the research was also secured through applying the recommendations of the content-knowledge professionals in the field. Furthermore, the reliability of the probe was obtained by assigning 80 of the articles to the rater groups before the study the results of which are listed in Table 3. As the Table shows, the reliability score among the groups roughly amounts to 1 which can be assumed as very high. For analyzing the data, the nonparametric test of Chi-square was used by setting the Alpha level at 0.05.

Table 3. Results of Inter-Rater Reliability

Writer Groups	Type of paper	NO	Reliability value
NEW	Quantitative	20	1.00
NEW	Qualitative	20	0.976
IEW	Quantitative	20	0.997
IEW	Qualitative	20	0.997

3. Results and Discussion

In the following, the results for the four research questions presented above along with the discussion and reason for each and every piece of finding of the study will be introduced.

Results for Research Question 1 (Quantitative RAs in Medical Physics): Table 4 demonstrates the frequency of metadiscourse markers in Medical Physics quantitative papers by native English writers (NEW) and Iranian English writers (IEW) so as to address the research question 1. As it is observed, NEW had

a higher frequency per 10000 than IPW in terms of using metadiscourse features (Mean difference = 56.1).

Table 4. Frequency of MDMs in Medical Physics quantitative RAs by NEW and IEW in general

Type of context	Total word	Raw Frequenc	Frequency per 10000
Quantitative papers by NEW	2620	21754	1204.37
Quantitative papers by IEW	3172	27624	1148.27

A chi-square test was conducted to identify the likelihood of a significant difference between the two groups but no difference was identified, χ^2 (1) = 1.333, p = 0.248.

Table 5 indicates the distribution of metadiscourse features by both groups in details. As can be identified, boosters and transition markers have been deployed to a high extent by both groups.

Table 5. Frequency of MDM in Medical Physics quantitative papers by NEW and IEW in details

MDM categories	NEW			IEW				
	Raw	F per 100 W	%	Raw	F per 10000 W	%	Chi-square value	p-value
Code glosses	286	131.47	11.1	360	130.3	11.4	0.004	0.951
Evidentials	194	89.18	7.5	372	134.67	11.9	9.45	**0.002**
Endophoric markers	108	49.65	4.2	172	62.26	5.4	1.29	0.257
Frame markers	142	65.28	5.5	148	53.58	4.7	1.02	0.313
Transition markers	398	182.95	15.5	540	195.48	17.1	0.381	0.537
Attitude markers	112	51.48	4.3	106	38.37	3.3	1.899	0.168
Boosters	824	378.78	32.1	930	336.66	29.6	2.464	0.117
Self mention	188	86.42	7.3	158	57.20	5.0	5.88	**0.015**
Engagement markers	12	5.52	0.5	8	2.90	0.3	1.00	0.317
Hedges	308	141.58	12	354	128.15	11.2	0.726	0.394
Total	2620	1204.4	100	3172	1148.3	100	1.333	0.248

To recognize the likelihood of any association between each individual subcategory across the two groups, a chi-square test was conducted. The results revealed a significant difference between metadiscourse features in evidentials and self-mentions. For the rest of the subcategories, the differences between the groups did not turn out to be significant.

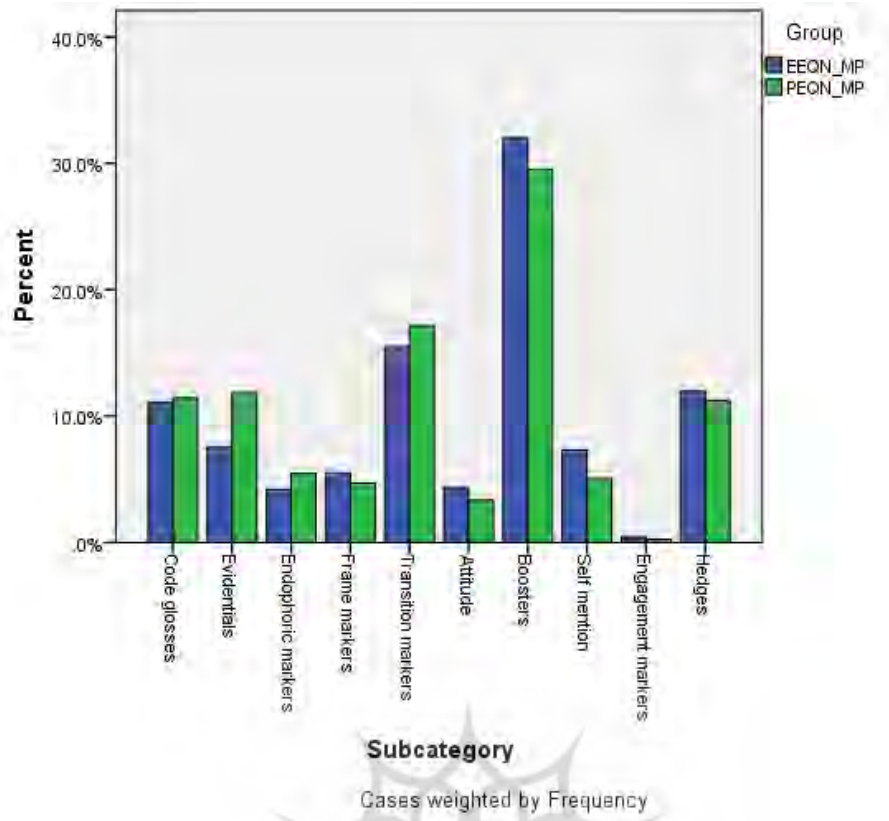

Fig. 1. Results of MDMs in quantitative papers of Medical Physics across subcategory type by NEW and IEW groups

As we can see from table 5, variation, in terms of MDMs between the two groups of Medical Physics quantitative writers (NEW & IEW), failed to be remarkable—only evidentials and self mentions' results were significant at the .05 level across the groups.

Evidentials: Iranians' higher use of evidentials (IEW, 134.67 *vs.* NEW, 89.17; p = 0.002) can be attributed to their tendency to refer to as many sources as possible for better consolidation of their position in the text. This higher number of evidentials can also help them bulk up their papers either in the form of including some block quotations or else so as to achieve an acceptable size.

Self mentions: Iranians' acceptability of their findings or perspectives can seemingly be materialized by lower use of self mentions as they have been culturally infused from school days to preferably employ passive structures in their writing rather than "I" and "we". This is consonant with what Keshavarz and Kheirieh (2011) assert as to the fact that "students are sometimes instructed by teachers in Persian essay classes to be more formal and polite by avoiding self-mention in their written texts" (p. 12). The perspective is also borne out by Ohta (1991) and Scollon (1994) who capitalize on the Asian writers' conventions of formality and politeness materialized, in part, through collective projection of their identity and thus avoiding some personal pronouns in their texts.

Results for Research Question 2 (Quantitative RAs in Nursing): Table 6 reveals the frequency results of the Nursing quantitative papers by NEW and IEW in general. The frequency per 10000 for the native English group was higher than that of the counterpart group (Mean difference = 44.51)

Table 6. Frequency of MDMs in Nursing quantitative RAs by NEW and IEW in general

Type of context	Total words	Raw Frequency	Frequency per 10000
Quantitative papers by NEW	36015	2560	710.81
Quantitative papers by IEW	27254	1816	666.3

A chi-square test was conducted to find out whether there was any significant difference between the two groups. But the results failed to recognize a significant difference, $\aleph^2$ (1) = 1.47, p = 0.22.

The varying tokens of MDMs were demarcatedly analyzed to find out which of them significantly differed between the two groups of writers. Table 7 depicts the results across metadiscourse types. As set out in the table, NEW used self-mentions more than the IEW (p = 0.05). However, IEW employed attitude markers in higher frequency than their counterparts, i.e., the NEW (p = 0.04). The two groups did not differ in terms of the remaining tokens.

Table 7. Frequency of MDMs in Nursing quantitative RAs by NEW and IEW in details

MDM categories	NEW			IEW				
	Raw	F per 1000 W	%	Raw	F per 10000 W	%	Chi-square value	p-value
Code glosses	334	92.74	12.9	238	87.33	12.9	0.20	0.65
Evidentials	226	62.75	8.7	228	83.66	12.4	3.00	0.08
Endophoric markers	124	34.43	4.7	106	38.89	5.8	0.34	0.59
Frame markers	144	39.98	5.5	78	28.62	4.3	1.75	0.18
Transition marke	596	165.49	22.9	364	133.56	19.8	3.21	0.07
Attitude marker	38	10.55	1.5	62	22.75	3.4	4.23	**0.04**
Boosters	650	180.48	24.9	480	176.12	26	0.04	0.83
Self mention	152	42.20	5.8	70	25.68	3.8	3.77	**0.05**
Engagement markers	8	2.22	0.3	2	.73	0.1	0.33	0.56
Hedges	332	92.18	12.7	212	77.79	11.5	1.15	0.28
Total	2560	710.81	100	1816	666.3	100	1.47	0.22

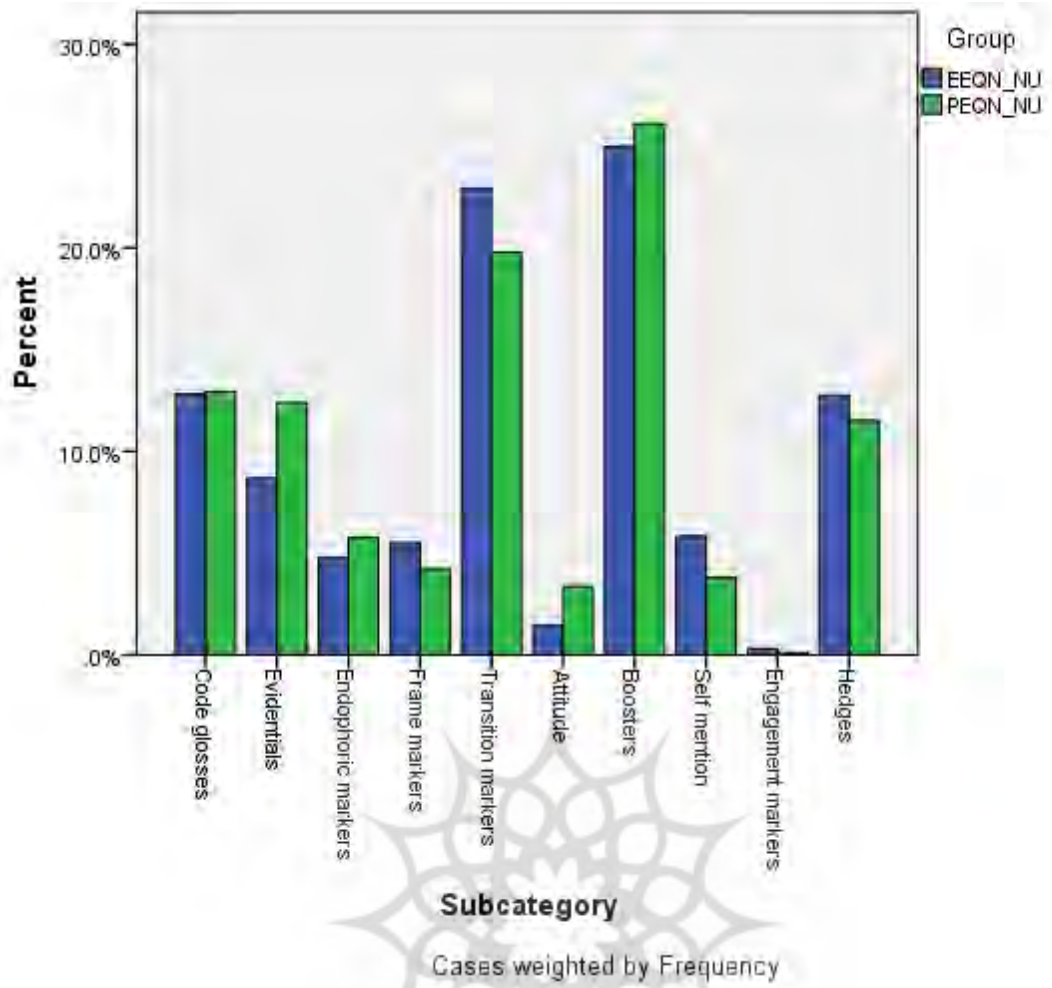

Fig. 2. Results of MDMs in quantitative papers of Nursing across subcategory type by NEW and IEW groups

As for research question 2 and the case of Nursing quantitative writers, again not much variation was observed across the groups. The only eye-catching signals which were different from others were self mentions and attitude markers.

Self mentions and attitude markers: For the higher significant use of self mentions by the Iranian writers, the above discussion rightly holds. However, to figure out why the use of attitude markers by this group was more noticeable (IEW, 22.75 *vs.* NEW, 10.55; p = 0.04), we once more reviewed the articles and saw that the IEW had, before winding up their discussion, indicated a higher affective attitude to proposition in their discourse although for the quantitative papers we expected to see just the comment on the status of the information— the Iranians in effect had gone a step further and had explained more to show their concern about their patients' health through attitudinal configuration. The following are some of the closing sentences with attitudinal signals deployed by the Iranian Nursing quantitative writers; far less such expressions could be found in the counterpart texts:

By improving women's health, their positive role in the society would become clearer, their sense of capability would be strengthened, and they would be more effective in taking care of the family health.

Given that most deprived areas of Iran lack adequate laboratory facilities, and most people living in these areas do not afford to pay for

specialized tests, ultrasonography of fetal NT is recommended as a useful and efficient, yet simple, inexpensive and applicable tool for screening of pregnant mothers in these areas.

- However, the need for and effect of various kinds of psychosocial support and intervention for the patients should not be questioned easily. The exact psychological functioning of breast cancer patients remains to be determined in the future studies.

- Sterile water was a promising option with no complications. Therefore, it can be used as a safe and effective irrigation fluid for achieving sterility.

Is this characteristic part of the Iranian Nursing persona? Can this then be generalized to other so-called soft-domain sciences? Conspicuously, more investigations on the subject are needed to properly propel the discussion.

Results for Research Question 3 (Qualitative RAs in Medical Physics): Table 8 compares the frequency of MDMs in Medical Physics qualitative RAs by NEW and IEW. Both group bore a different frequency of MDMs. The frequency of use by the NEW was higher than that of the counterpart group (Mean difference = 134.75).

Table 5. Frequency MDMs in Medical Physics qualitative papers by NEW and IEW in general

Type of context	Total words	Raw Frequency	Frequency per 10000
Qualitative papers by NEW	16676	1930	1157.35
Qualitative papers by IEW	24194	2474	1022.6

A chi-square test was conducted to explore the presence of any significant difference between the two groups. And the results identified significant difference between the groups, $\aleph^2$ (1) = 8.23, p = 0.004.

To have a more in-depth comparison, the different MDM subcategories were compared between the NEW and IEW in qualitative texts. The chi-square results identified a statistically significant difference across the groups in using metadiscourse markers (p > 0.05). More specifically, IEW used endophoric markers more than the native English writers while it was the reverse for the engagement markers (p = 0.003).

Table 9. Frequency MDMs in Medical Physics qualitative papers by NEW and IEW in details

MDM categories	NEW			IEW				
	Raw	F per 100 W	%	Raw	F per 10000 W	%	Chi-square value	p-value
Code glosses	166	99.54	8.7	204	84.32	8.2	1.39	0.24
Evidentials	292	175.10	15.3	376	155.41	15.2	1.21	0.27
Endophoric markers	40	23.99	2.1	106	43.81	4.3	5.88	**0.015**

Frame markers	122	73.16	6.4	152	62.83	6.2	0.73	0.39
Transition markers	332	199.09	17.4	436	180.21	17.6	0.95	0.33
Attitude markers	164	98.34	8.6	236	97.54	9.6	0.05	0.82
Boosters	464	278.24	24.3	528	218.24	21.3	0.20	0.65
Self mention	80	47.97	4.2	126	52.08	5.1	0.16	0.69
Engagement markers	24	14.39	1.2	4	1.65	0.2	9.00	**0.003**
Hedges	224	134.32	11.7	306	126.48	12.3	0.25	0.62
Total	1930	1157.35	100	2474	1022.6	100	8.23	**0.004**

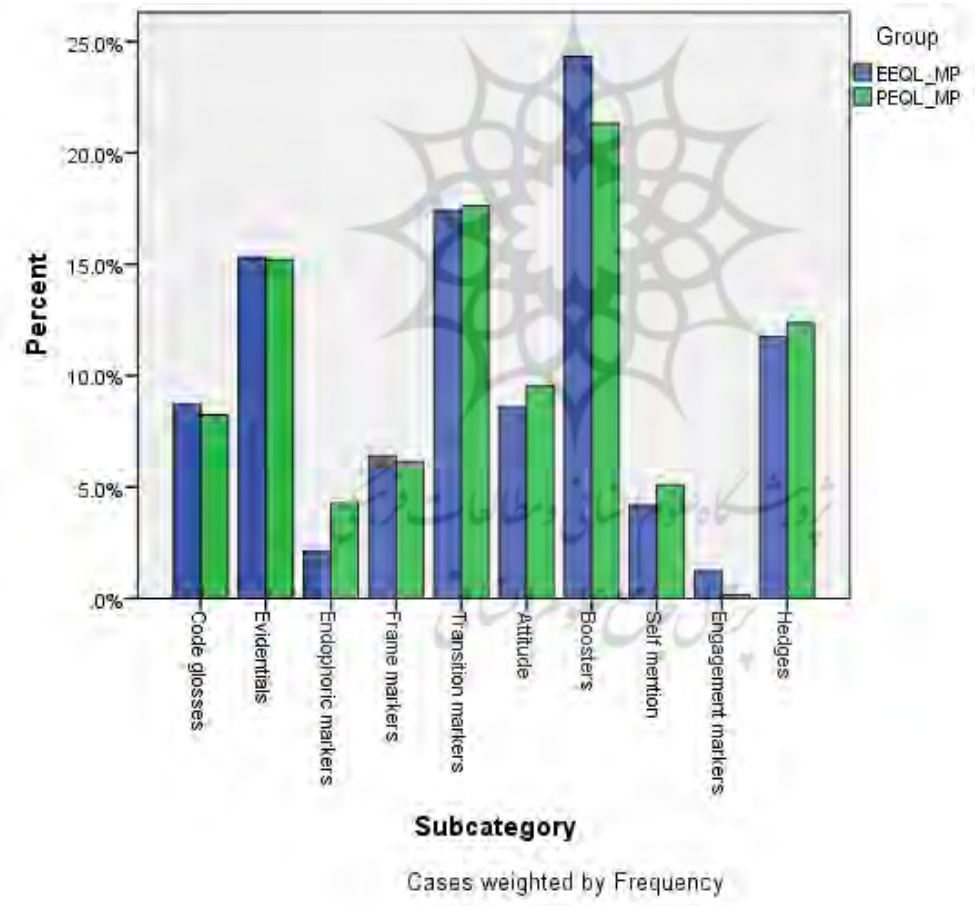

Fig. 3. Results of MDMs in qualitative papers of Medical Physics across subcategory type by NEW and IEW groups

To look for the disparities likely existing between the groups of Medical Physics qualitative writers (Research Question 3), we examined Table 9 and observed a significant difference in terms of endophoric markers and engagement markers—for other features non-significant difference was identified.

Endophoric markers: The endophoric markers' higher deployment by Iranians (IEW, 43.81 *vs.* NEW, 23.11; $p = 0.015$) can be assigned to their far more use of visual representations—primarily figures and then tables—so as to facilitate comprehension through making propositional content salient. Seemingly, for providing saliency, native speakers see less need to resort merely to visual encoding as they expertly can find other ways to steer their audience to the preferred interpretation of the intended discourse. In this vein, Cao and Hu (2014) compared interactive metadiscourse disciplinarily across education, applied linguistics, and psychology to pin down the influence of paradigm and discipline in RAs. And finally they concurred that "although [native English] authors of qualitative RAs also frequently referred to visual representations in their texts, their repertoires of such representations were more diversified,…" (p. 24).

Engagement markers: The far more application of the engagement markers by the English natives (NEW, 14.39 *vs.* 1.65; $p = 0.003$) crafting across qualitative paradigm and Medical Physics discipline can be ascribed, as was earlier discussed, to their ability in creating and formulating structural variations such as inclusive *we*, questions, directives, as well as interjections, something that non-natives most often fail to afford.

Results for Research Question 4 (Qualitative RAs in Nursing): As displayed in Table 10, there was not a big difference between the frequency of metadiscourse markers between NEW and IEW (Mean difference = 25.25).

The results obtained from the chi-square test showed no statistically significant difference between the groups at large, χ^2 (1) = 0.446, p = 0.504.

Table 10. Frequency of MDMs in Nursing qualitative RAs by NEW and IEW in general

Type of context	Total words	Raw Frequency	Frequency per 10000
Qualitative papers by NEW	41321	2946	712.95
Qualitative papers by IEW	23788	1636	687.70

Table 11 sets out the results across the metadiscourse features. The transition markers were used more frequently than the other subcategories.

To identify any significant difference, the different MDMs were compared between NEW and IEW. The results revealed a significant difference across the two groups in the subcategories related to endophoric markers ($p = 0.00$), frame markers ($p = 0.04$), transition markers ($p = 0.003$), attitude markers (0.029), boosters (0.027), self mentions (0.001) and hedges (0.022). The IEW used endophoric markers, frame markers, attitude markers and boosters more than the NEW. The NEW, however, deployed transition markers, self mentions and hedges higher than the IEW. The two groups did not turn out to be significantly different for other tokens.

Table 11. Frequency of MDMs in Nursing qualitative RAs by NEW and IEW in details

MDM categories	NEW			IEW				
	Raw	F per 100 W	%	Raw	F per 10000 W	%	Chi-square value	p-value
Code glosses	328	79.38	11.1	220	92.48	13.5	0.98	0.32
Evidentials	402	97.29	13.7	240	100.89	14.8	0.08	0.78
Endophoric markers	2	.48	0.0	40	16.82	2.5	14.22	**0.00**
Frame markers	142	34.37	4.8	126	52.97	7.7	4.15	**0.04**
Transition markers	898	217.32	30.6	380	159.74	23.4	8.61	**0.003**
Attitude markers	134	32.43	4.5	124	52.13	7.6	4.76	**0.029**
Boosters	292	70.67	10	238	100.05	14.6	4.92	**0.027**
Self mention	216	52.27	7.3	44	18.50	2.6	15.34	**0.001**
Engagement markers	24	5.81	0.8	6	2.52	0.4	1.00	0.32
Hedges	500	121.00	17.1	210	88.28	12.9	5.21	**0.022**
Total	2946	712.95	100	1636	687.7	100	0.446	0.504

Considering Research Question 4, the general frequency results (Table 10) proved to be devoid of a high variation (mean difference = 25.25). However, when it came to examining the subcategories in details (table 24), they were shown to bear little resemblance with the three previous research findings, i.e., seven out of ten tokens showed to be markedly significant at the .05 level across the groups. In effect, the endophoric markers, frame markers, attitude markers and boosters had been used at a higher level by the Iranians writers. How can we account for such diversities?

Endophoric markers: As for these markers, when compared with the results of qualitative RAs in Medical Physics, we observed a significant main effect of paradigm (Nursing, $p = 0.00$ & Medical Physics, $p = 0.015$)—this was not the case with the quantitative papers though. It shows that IEW bear a tendency to deploy higher endophoric markers in qualitative persuasive papers. We once more examined the articles to see why there is such a difference. Appealed by the content, we identified some tables captioned by expressions such as "Patients' status of health" or "Characteristics of the study participants" and the like the inclusion of which could for certain help them shun, to some extent, the complexities of writing in English (Note that for *quantitative* papers both groups used figures and tables adequately.).

Frame markers: In connection with frame markers' increment in frequency of use by the Iranians, it should not be discounted that

although we previously discussed in favor of Persian as a reader-oriented language in which writers most often accommodate less explanations in their discourse, when, however, it comes to Iranians' writing in their second language, more explanation and clarification of the propositional content is provided by them so as not to leave the content ambiguous to their audience—framing information and guiding readers by endophoric markers stand as good instances in this regard.

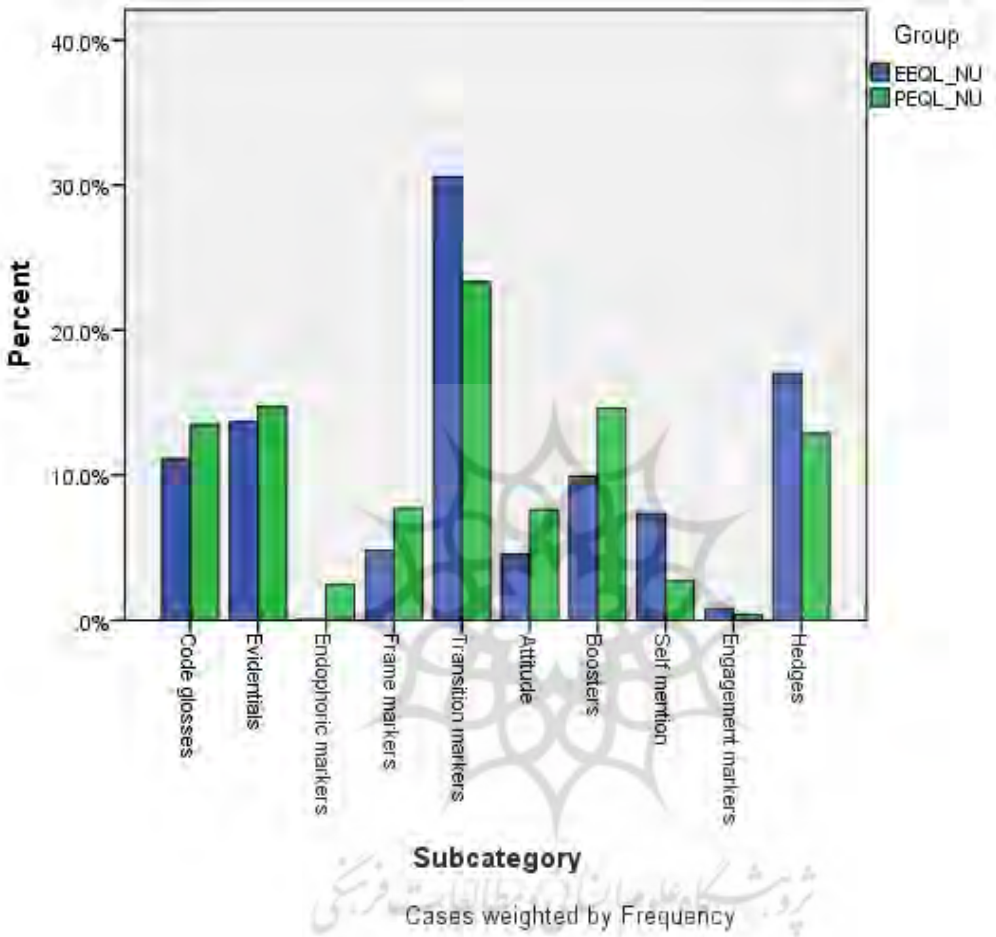

Fig. 4. Results of MDMs in qualitative papers of Nursing across subcategory type by NEW and IEW groups

Attitude markers: Higher use of attitude markers by the IEW (IEW, 100.05, vs. NEW, 70.67; p = 0.027) is however a significant main effect of discipline as the increase can only be observed in the Nursing camp (both qualitative and quantitative writers). This finding may well be ascribed to the higher disposition of the IEW to take position and thus craft with more affective attitude when involved in the soft-domain discipline of Nursing. Granted that this is true, we still cannot overlook the instrumental impact of Iranian cultural identity in rhetorical orientation of discourse in this way. It seems to us that both of these factors exert their own effect.

Transition markers, self mentions, and hedges: With regard to the use of transition markers, self mentions, and hedges, as was explored in Table 11, the English natives overrode their Iranian counterparts (p = 0.003, p = 0.001, & p = 0.022 respectively) to make a significant difference across each category. As relating to the previous research question (quantitative RAs) we were at a loss to find such

a difference, it is possible to attribute this epistemic knowledge to the nature of the qualitative argumentative-type texts through which the English natives demonstrate higher ability to formulate their papers with more transition markers and hence help their audience interpret pragmatic connection in the intended discourse in the nursing texts. Moreover, the discussion made around the Iranians' mitigated use of self mentions through some previous pertinent research questions, here also holds. Finally, the lower application of hedges by the Iranian Nursing writers (IEW, 88.28 *vs.* NEW, 121.00; $p = 0.022$) more possibly stems from their inclination in coaching their voices with rather higher certainty through deploying more boosters (discussed above) which thereby lends itself well to using less hedging devices in discourse.

4. Final Remarks

Crafting research papers is a critical and complex part of language development. Literature on RAs informs us that MDMs constitute an indispensable component of the writing quality not only in the mother tongue but also in a second/foreign language. Consensually admitted, metadiscourse is "an important means of facilitating communication, supporting a position, increasing readability, and building a relationship with an audience" (Hyland, 2005, p.5). As to the achievement of certain purposes behind using metadiscourse features including forming relation between main clauses, referring to other parts of a text, referring to other texts, elaborating meaning, emphasizing certainty, expressing writer's attitude, and building relation with the readers in general, the critical role of MDMs cannot be discounted. Moreover, it is solely through providing a comprehensive account of their applications that the writers of RAs will be assisted to consciously take heed of the appropriate employment of these tokens.

Contributing to this line of investigation, i.e., metadiscourse, this research was developed to examine the nature and distribution of MDMs in RAs. Generally, this study aimed to look at the use of all kinds of MDMs in a comparable corpus of English and Persian RAs. More specifically, the purpose of this study was to zero in on some sort of subdisciplinary and paradigmatic as well as cross-linguistic and cross-cultural variations in English and Persian RAs and on the rhetorical features of the Discussion and Conclusion (post-method) sections of these papers. It intended to conduct a comparative study of Persian and English to find out whether there are any commonalities or disparities between the two languages in the deployment of MDMs.

The motivation for this study was primarily pedagogical. The aim was to achieve a more profound awareness of the nature of such RAs in order to help in understanding a clearer identity of textual organization of discourse. Evidently, the ESP and material development courses can also benefit from the findings in order to sensitize students more to the norms of writing along with the discrepancies that exist between the cross-cultural writers in different disciplinary paradigms. Moreover, the results can lend themselves well to orienting future research in exploring the identities of metadiscourse features in diverse RA moves. This and similar investigations can also help improve learners' better comprehension of the texts (Camiciottoli, 2003: Daftaryfard, 2002; Dastgoshadeh, 2001; Jalilifar & Alipour; 2007; Khorvash, 2008; Massaabi, 2014; Parvaresh & Nemati, 2008; Tavakoli, Dabaghi, and Khorvash, 2010) as reading ability is assumed to be a critical skill in most of the academic contexts in which English is learnt as a foreign language. And finally, the article writing

workshops held for L2 academic teachers and researchers who write in English can surely be ameliorated by drawing on such metadiscoursal findings.

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چکیده

عناصر فراکلامی به‌عنوان اجزاء مهم کلام به‌طور وسیعی در زبان‌ها و فرهنگ‌های مختلف مورد بررسی قرار گرفته‌اند ولی از نظر بررسی زیررشته‌ای این عناصر، مخصوصاً درحوزه پزشکی، ظاهراً هنوز راه درازی در پیش است. مطالعهٔ حاضر که برگرفته از طبقه‌بندی عناصر فرا کلامی هایلند (۲۰۰۵) است با تشخیص این خلاء علمی به تحقیق و تفحص در ۱۸۰ مقاله تحریریافته به زبان انگلیسی در رشته‌های فیزیک پزشکی و پرستاری به‌عنوان دو زیررشته قابل قیاس درحوزه پزشکی پرداخته است و انتظارمی‌رود که یافته‌های این تحقیق بتواند مشکلات پژوهشی محققان دانشگاهی و دانشجویان دوره‌های عالی دانشگاه‌ها در تحریر مقالات علمی را برآورده سازد.

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