

Medical Research Article Introductions in Persian and English Contexts: Rhetorical and Metadiscoursal Differences

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Received: 07/02/2015

Accepted: 25/08/2015

Abstract

Medical discourse has recently attracted much scholarly attention. However, few studies have concentrated on both the overall rhetorical structure of the research article (RA) and the specific lexicogrammatical features of the texts, particularly English-Persian contrastive studies on medical RAs. Relying on Nwogu's (1997) framework, the present study aimed at providing a macroanalysis of the Introduction sections of 3 groups of texts, namely medical RAs written and published in international English journals, those written in English by Iranian writers and published in Iran, and those written and published in Persian in Iran. Results of the quantitative and qualitative analyses revealed that the Introduction sections of the 3 groups are similar regarding their move frequency and occurrence, but the realization of these 3 moves in terms of metadiscourse markers was radically different in these 2 languages, although the identified metadiscourse markers were not move-specific. Findings could be of help to Iranian scholars active in publishing English journals.

Keywords: Research Article (RA); Introduction; Move; Metadiscourse Marker

1. Introduction

As the primary site for the construction and negotiation of knowledge in any particular field, research articles (RAs) are considered the most highly valued genre used by scientific discourse communities (Swales, 1990). RAs are also a favorable medium of reporting research findings for international knowledge exchange, providing opportunities for nonnative researchers to have the chance to publish their local findings.

Over the recent years, there has been an expansion of scholarly interest in the overall organization of various parts of RAs and, more specifically, in their structure, social construction, historical evolution, and so on. What we know about the macrostructure of English RAs comes largely from the work within the tradition

of English for specific purposes (ESP), pioneered by the work of Swales (1990) and Hopkins and Dudley-Evans (1988), in their attempts to provide a description of the structure of English RAs for novice researchers.

Swales' structural moves analyses, including the four-move model (Swales 1981) and the create a research space (CARS) model (Swales, 1990), are extensively used in ESP genre analysis studies to help researchers identify a series of certain moves common to specific genres. These moves, which serve to describe the content and linguistic choices most commonly observed in a genre, are defined as "discoursal or rhetorical units that perform a coherent communicative function in a written or spoken discourse" (Swales, 2004, p. 228), and are, in turn, realized by a series of submoves, or steps, which are the linguistic realizations of the moves. The CARS model (Swales, 1990), for instance, describes the Introduction section of scientific RAs in terms of three major moves: (a) Establish a territory, (b) establish a niche, and (c) occupy the niche—which can be identified and realized by specific grammatical and lexical markers.

Swales' (1990, 2004) structural moves analysis, despite the shortcomings it has, provides a well-established theoretical framework that has been used to describe various research report genres (Holmes, 1997; Kanoksilapatham, 2005; Peng, 1987; Swales, 1990, 2004; Wang & Bai, 2007). In this respect, studies within this tradition have been the most productive in describing the conventions of written medical discourse. Some of these studies are concerned with specific sections of the medical RAs (e.g., Bruce, 1984; Dubois, 1997), whereas others analyze them as a whole (e.g. Fryer, 2012; Gledhill, 1995; Nwogu, 1997; Skelton, 1994).

Studies of medical discourse have never been restricted to those focusing on the organization of information or the rhetorical purpose of the RA genre. Indeed, there are also those that have tended to concentrate on specific lexicogrammatical features of texts, such as tense/voice (Heslot, 1982, as cited in Swales, 1990), modality (Adams Smith, 1984; Yang, Zheng, & Ge, 2015), theme (Gosden, 1992; Williams, 2009), citations (Hyland, 1999; Kulkarni, Aziz, Shams, & Busse, 2011; Thompson & Tribble, 2001), processes (MacDonald, 2002), and personals (Tarone, Dwyer, Gillette, & Vincent, 1998), to name a few (for a recent review on mapping and describing the characteristics of various medical discourse practices, see Gotti & Salager-Meyer, 2006). Not only do these studies help researchers in arriving at a comprehensive linguistic description of medical RAs, they can be used as a tool kit for those nonnative English speakers who endeavor to publish in international English journals. However, few, if any, of these studies have concentrated on both the overall rhetorical structure of the RA and the specific lexicogrammatical features of the texts. The latter has a prolonged influence on how the former is realized linguistically. Therefore, researchers obsessed with helping nonnative English

scholars who are expected to communicate effectively in a global context need to familiarize them with both similarities and differences between the rhetorical conventions of academic writing in their native language and in English (e.g., Samraj, 2002, 2005; Swales, 1990; Swales & Najjar, 1987) and the specific lexicogrammatical features employed.

One aspect of such lexicogrammatical features is metadiscourse awareness which specifically refers to “self-reflective linguistic material referring to the evolving text and to the writer and imagined reader of that text” (Hyland & Tse 2004, p. 156), or as Swales (1990) rightly mentions “writing about the evolving text rather than referring to the subject matter” (p.188). Hyland and Tse (2004) believe that writing is viewed as an engagement between writer and reader who possess a social and communicative basis, and metadiscourse is related to the “ways writers project themselves into their discourse to signal their attitude towards both the content and the audience of the text” (p. 156).

In the context of Iran, there are few contrastive studies on medical RAs written by Iranian scholars and those written by native scholars. Mahzari (2008) analyzed the Introduction sections of English-American medical RAs and those of Iranian RAs written in Persian. The results showed a similarity in the move frequency of the Introduction sections of the RAs in both languages (i.e., English and Persian). The findings, however, revealed that the realization of these moves is radically different in the two languages (Mahzari, 2008, p. 376). Because Mahzari’s study followed Swales’ (1990) framework, the same criticisms regarding Swales’ model can be voiced against this study, as well. Also, using Swales’ model, which provides the overall structure of RAs, in general, cannot be well-justified, given the interdisciplinary differences in the rhetorical styles of this important academic discourse.

Following this line of research and working under Nwogu’s (1997) framework, Sayfoury (2010) attempted to compare and contrast the rhetorical features of medical RAs published in Iranian and English-American journals by means of ESP move analysis of the three groups of Iranian ISI, Iranian non-ISI, and English-American medical RAs. The analytic results of the move analysis phase revealed that the two groups of the Iranian RAs employed significantly a smaller number of submoves (i.e., reference to main research problems, reference to limitations of previous research, and reference to main research procedures) in their Introduction sections compared to the English-American RAs. However, Sayfoury (2010), despite employing a solid framework specifically dealing with medical RAs, did not do justice to the topic it was supposed to tackle. In fact, language, in general, and writing, in particular, are cultural phenomena and part of the language problems encountered by nonnative-speaking writers that can be understood as the result of

linguistic and rhetorical conventions inherent in their home cultures, preventing them at times from achieving academic fluency in the Western context. It follows that a study which is dealing with L2 writing should seek to understand the different ways that cultures arrange information and express ideas in writing. However, Sayfoury (2010) took no notice of the vital role that L1 usage can play in this regard.

Therefore, in order to scrutinize the Iranian medical RAs and investigate the factors affecting the intelligibility of their rhetorical styles, this study sought to discover the rhetorical strengths and weaknesses of the Iranian medical RAs in English. Specifically, relying on the framework introduced by Nwogu (1997), the present study was an attempt to provide a macroanalysis of the Introduction sections of three groups of texts, namely medical RAs written in English by native Iranian writers and published in Iran (henceforth, EIMRAs), medical RAs written in English and published in English journals of English-speaking countries (henceforth, EEMRAs), and medical RAs written in Persian and published in Persian medical journals in Iran (henceforth, PIMRAs).

Nwogu's (1997) model, which is discipline-specific, seems to be more precise than Swales' (1990) model in terms of analyzing medical texts; thus, it will more readily accommodate the discourse practices of the three groups of writers in this study. Furthermore, the results from the three-way analysis across the two languages are intended to promote international academic discourse in a cross-cultural context. In particular, the inclusion of the Persian RA group allows a more nuanced approach to the textual characteristics of the Introduction sections, facilitating international publication and recognition.

In addition, different metadiscourse markers employed by the writers of these three groups of texts were analyzed and compared to see if there were any significant differences. To this aim, the metadiscourse taxonomy of Hyland (2004) was used. This taxonomy involves interactive resources through which the writer manages the information flow to provide his or her preferred interpretations and interactional resources that "focus on the participants of the interaction and seek to display the writer's persona and a tenor consistent with the norms of the disciplinary community" (Hyland 2004, p. 139)

2. Method

2.1 Research Questions

In exploring the overall textual qualities of the three groups of texts (i.e., EEMRAs, EIMRAs, and PIMRAs), the study sought answers to the following questions:

1. Is there any significant difference between the overall macrostructural patterns commonly used in the Introduction sections of EEMRAs, EIMRAs, and PIMRAs?
2. Is there any significant difference between the type of metadiscourse markers employed by the writers of EEMRAs, EIMRAs and PIMRAs?

2.2 Theoretical Frameworks

Because this study was concerned with two different aspects of the corpus (i.e., the macrostructural patterns and the metadiscourse markers), two different models were used for each purpose. Because these two frameworks were imposed on the texts, the approach adopted for analyzing the data was top-down.

2.2.1 Nwogu's model

The model for analyzing the rhetorical organization of the corpus is devised by Nwogu (1997), depicting his analysis of the moves deployed in the different sections of medical RAs. Nwogu's (1997) study accounts for the schematic structure of information in the medical research paper using Swales' (1990) genre-analysis model, although Nwogu's study represents an application of the model beyond Swales' RA Introduction to the whole body of the RA.

Nwogu (1997) carried out a structural moves analysis of a corpus of 15 medical RAs and, consequently, identified 11 schematic units or moves (see Table 1). Altogether, these units constitute what he terms the overall semantic macrostructure of the genre. Since 1997, Nwogu's study has remained the most comprehensive one in most studies concerned with the genre analysis of English medical RAs:

Table 1. *Moves and Submoves (Steps) of Introduction Section of Medical RAs (Nwogu, 1997)*

Introduction	
Move 1: Presenting background information	(1) Reference to established knowledge of the field
Move 2: Reviewing related research:	(2) Reference to main research problems
	(1) Reference to previous research
Move 3: Presenting new research:	(2) Reference to limitations of previous research
	(1) Reference to research purpose
	(2) Reference to main research procedure

Similarly, the textual analysis of the corpus in this study adopted the methodology used by Nwogu. However, whereas the materials in Nwogu's study was published during the years 1985-1987, the data here were selected from similar,

but not necessarily the same, publication sources, yet during a more recent (2007-2013) period. Hopefully, this similarity provides a useful diachronic comparison between the two studies.

2.2.2 Hyland's model

Hyland (2004) broadly divides metadiscourse markers into two groups: interactive and interactional resources. The former is further divided to:

1. Transitions: These devices mainly indicate additive, contrastive, and consequential steps in the discourse. Some examples are *in addition*, *and*, *but*, and *thus*
2. Frame markers: These devices indicate text boundaries or elements of schematic text structure like *my purpose here is to* and *to conclude*.
3. Endophoric markers: These markers refer to information in other parts of the text and make the additional material available for the readers. Some examples are *in Section 2* and *Noted above*.
4. Evidential markers: These devices refer to information from other texts. Some examples are *according to X* and *Y states that*.
5. Code glosses: These markers elaborate propositional meaning. Some examples are *namely*, *e.g.*, *such as*, and *in other words*.

The latter involves:

1. Hedges: Hedges indicate the writer's unwillingness to present propositional information categorically, such as *about*, and *perhaps*.
2. Boosters: These devices express certainty. Some examples are *it is clear that*, and *definitely*.
3. Attitude markers: These markers indicate the writer's appraisal of propositional information. Some examples are *I agree* and *surprisingly*.
4. Engagement markers: These devices address readers explicitly or make a relationship with the reader. Some examples are *you can see that*, *note that*, and *consider*.
5. Self-mentions: These refer to the extent of author presence in terms of first person pronouns and possessives. Some examples are *I*, *we*, *our*, and *my*.

These resources are believed to play a decisive role in writing a well-crafted academic research text.

2.3 Materials and Data Collection

Because analysis involving texts of different fields would be arguably more beneficial in that they provide broader generalizations but may also create difficulties in reaching generalization due to field-specific writing conventions, we chose RAs dealing only with topical and widely discussed subdisciplines in medical research and the popular journals, which was ascertained by consultations from experts in the field. The general structure of the nonnative English texts conformed to a standard format of RAs, that is, the division of the text into subsections: Introduction, Methods, Results, and Discussion (IMRD; Swales, 1990). This similarity was an important criterion for text selection and the starting point of analysis of the differences in the text groups. That is, the RAs deploying other alternative structures such as IMRDC fell outside the scope of the present study.

To choose the RAs, the following criteria were taken into account. First, 45 experts in the field of medicine were consulted using a questionnaire as to which journals (i.e., local and international) and subdisciplines are of high importance, reputation, and readership. This was done by providing them with a list of ISI medical journals and two lists of Persian and English medical journals published in Iran. Then, they were asked to mark their choices. Their suggestions were of great help in choosing the journals and deciding on the number of RAs to be included in the study. Second, due to the dynamic nature of scientific written genres, the corpus was restricted to a period of 7 years (2007-2013). Third, as regards the nativeness of the writers, the rhetorical features employed in the RAs are regarded as the by-products of different probable real stages of productions, evaluations, and revisions. It is not, therefore, the (non)nativeness of the writer(s) of the medical RAs which matters, but the (non)nativeness of the context in which the related journal is published. Thus, care was exercised to consider the style of each RA responsible for the generic features employed, rather than the writer of the RA. Finally, the corpus which consisted of 90 RAs (see Appendix) was categorized into three groups: EIMRAs, EEMRAs, and PIMRAs. The RAs were selected by means of stattrek stratified random sampling which was available online at: <http://stattrek.com/Tables/Random.aspx> (last retrieved, April, 2014). Random sampling was carried out 15 times for the 15 journals to select six RAs from each journal. The RAs were, then, coded in each group from 1 to 30 (EEMRA: 1-30, EIMRA: 1-30, and PIMRA: 1-30).

In fact, each group of the corpus consisted of 30 RAs. The word counts of the Introduction sections in EEMRAs, EIMRAs, and PIMRAs were 8,897, 10,405, and 14,503, respectively.

2.4 Move Analysis

The analysis began with identifying the general features of the overall surface of the three text groups (i.e., the IMRD structure). The main analysis focused on the generic structure. Each move and step was identified and labeled using Nwogu's (1997) model for the Introduction section. The moves and steps were, then, applied to phrases, clauses, or paragraphs that were identified as carrying a particular function in the generic structure.

The texts in the corpus were analyzed into hierarchical schematic structures, or moves. The process of identification of the schematic structures involved the following procedures adopted from Nwogu (1997, pp. 123-124):

1. Focusing on the propositions in the texts and identifying important information
2. Searching for linguistic clues such as function words, explicit lexemes and expressions, verb forms, discourse conjuncts and markers, structural headings and subheadings, summary statements, and so on
3. Classifying and paraphrasing the context of discourse based on the linguistic clues
4. Assigning discourse functions to the overall information in segments of text as well as constituent elements of information in the segments
5. Establishing whether or not the function identified is a general one by reference to other texts in the corpus

A text segment is taken to be a move if there is an association between a function and the linguistic clues by which it is realized. Moreover, the function must have occurred with about 50% regularity in the corpus to be considered a stable move (Nwogu, 1997). It is noteworthy that certain submoves recurred in the Introduction sections of all the three groups, but a single occurrence of these submoves justified their inclusion in the frequency table of that move.

Having determined the procedures of segmenting a particular text into moves, we began with a pilot coding with two coders. Because the coders were seeking to understand the functional-semantic purposes of text segments, the coding was done by hand. The initial analyses were, then, discussed and fine-tuned until there was agreement on the functional and semantic purposes that were being realized by the text segments, resulting in a protocol of move and step features for the genre, with clearly defined purposes and examples.

We applied this protocol to the corpus. However, to guard against subjectivity, the complete Introduction sections of 20% of the corpus selected

randomly were analyzed by the researchers twice with an interval of more than 1 month. Also, two other Ph.D. candidates of TEFL (raters 1 and 2), both having been revising English RAs written by Iranian scholars for several years, were asked to analyze the same sections of the same RAs and code the moves and submoves based on the framework given above. To further enhance the validity of the data for the statistical analysis, we recoded the moves and submoves of 20% of the sample with an interval of more than 1 month, too. Kappa coefficient (k) was used to test the intrarater reliability, and the reliability index for the agreement between the initial coding and second coding of the corpus was (intrarater, $k = 0.875$; interrater, $k = 0.812$). Any remaining discrepancies were resolved through discussion, clarification, and criteria checking.

2.5 Metadiscourse Markers Analysis

Because the word count of the Introduction sections in each group and across the three groups was inevitably unequal, we decided to calculate the frequency of the metadiscourse markers per 4,000 words of each text to ensure comparability of the results across the three groups, as in Crismore et al. (1993). This was done to make the length of the texts consistent. Then, the Introduction sections of the texts were carefully read word-by-word, with specific attention to the functions and meanings of the words in order to identify and locate the metadiscourse markers through the adopted model of Hyland and Tse (2004), which easily lent itself to the research purpose. All the data were analyzed twice by the researchers to avoid any mistakes in detecting the metadiscourse markers in the whole corpus. Intercoder reliability procedures were also implemented in this study to demonstrate that tokens of discourse markers can be identified with a high degree of accuracy by trained coders (Burgess, 2002; Crookes, 1986; Kanoksilapatham, 2005). Any remaining discrepancies were resolved through discussion, clarification, and criteria checking.

The process of the discourse markers identification was laborious, considering the fact that metadiscourse expresses discourse-internal relations (Hyland, 2005). That is, expressions which are ambiguous in their reference, as it is not easy to identify whether they refer to the text or to the content. Therefore, we did not use any text-analyzing software, but manually identified and coded each instance of the interactive and interactional metadiscourse markers in context and excluded items that could be used as metadiscoursal devices elsewhere but signaled discourse-external relations in our context. Still, there were cases in which making a judgment was not easy. As an example, metadiscourse markers that make reference to the text clearly point to the text itself—either as a whole or a specific part—and can have a nominal or an adverbial form. These markers, however, include ambiguous adverbs of time and place. This ambiguity implies that it is sometimes difficult to make a

clear separation between reference to the text and reference to the content when using these adverbs as discourse markers. This is illustrated in the following excerpts from our dataset:

- A. Influenza incidence and mortality data do not typically show obvious effects of school closures, but several studies (2-4) have used mathematical models to infer that closing schools reduced transmission in various situations, including the first phase of the 2009 influenza pandemic in Hong Kong (5). **Here**, we present the effects of closing schools in Alberta, Canada, during the 2009 pandemic.
- B. They developed uniform protocols for diagnosis, treatment, and follow-up in real time, based on evolving information. **Here**, they report early observations on patients found to have meningitis.

3. Results

In this section, the results of the move analysis are presented first, followed by the results of the distribution of the different types of the metadiscourse markers across the three groups of texts.

3.1 Moves and Submoves

The analysis of the moves and submoves in the corpora comprising 90 RA Introduction sections revealed an overall similarity across the three groups, but some slight differences between the EEMRAs and the EIMRAs as far as the English texts were concerned. As with the Persian texts, the results also showed no considerable variations between the two English texts and the PIMRAs. As seen in Table 2, moves 1 and 3 are present in 96.66-100% of all the Introductions, making them obligatory components in the writing of the three groups. Regarding move 2, it can be observed that whereas the authors of the RAs in the EEMRA and the PIMRA consistently used this move to place their studies within the context of ongoing research (reaching 100% of all Introductions), the writers in the EIMRA subcorpus employed this move in 90% of all Introductions, making their texts not significantly different from the other two groups:

Table 2. *Frequency of Occurrences and Distribution of Three Moves in Each Group*

Moves	English L1 (EEMRAs)	English L2 (EIMRAs)	Persian L1 (PIMRAs)
	No. (%)	No. (%)	No. (%)
Move 1	30 (100)	30 (100)	30 (100)
Move 2	30 (100)	27 (90)	30 (100)
Move 3	30 (100)	30 (100)	29 (96.66)

3.1.1 Move 1: Presenting background information

Initiating almost all Introductions, this move provides the essential background information the readers need to continue reading the whole RA. In other words, this move specifies the topic of discourse, either by “presenting knowledge which is regarded as having been true for a long period of time [M1S1] or by highlighting the main research problem or both [M1S2]” (Nwogu, 1997, p. 125). It contains information that could be “persuasive” (Swales, 1981) or “anecdotal” and “didactic,” presenting a sequential account of events (Nwogu, 1997, p. 125).

Notwithstanding the fact that Nwogu (1997) found move 1 to be an optional move (appearing only in 7 out of 15 RAs he analyzed), all the three groups conventionalized this move because it is a constant rhetorical feature of the Introduction sections. Table 3 illustrates the frequency of the occurrence of this move across the three groups:

Table 3. *Summary of Occurrences of Move 1 and Its Submoves*

Structure of Move 1	EEMRAs No. (%)	EIMRAs No. (%)	PIMRAs No. (%)
Instances of Three Moves	141 (100)	157 (100)	184 (100)
Instances of Move 1	42 (29.78)	52 (33.12)	58 (31.52)
M1S1	28	32	49
M1S2	14	20	9
RAs With This Feature	30	30	30

As to the salient linguistic features, this move is characterized by the predominant use of present tense verb forms (*People who self-harm **have** an increased risk of premature death*), as well as the use of locative and temporal adverbials as parts of preparatory expressions and statements (***In occupational settings**, chronic lead intoxication **is** a slow and insidious disease*). However, past tense verb forms are also employed to describe the findings of specific studies (*Subsequent studies²⁻⁷ **established** that . . .*). In addition, the analysis of the citations across the three groups of the corpus showed that over 95% of references were made nonintegrally. This is in agreement with the findings of another study on medical RAs by Fryer (2012). In addition to modal finites which convey probability, epithets expressing negative appreciation (e.g., *alarming*, *ominous*) are also very common throughout this move.

As presented in Table 3 and with regard to the submoves in move 1 in the Introduction sections, the authors of PIMRAs tended to appeal much less to M1S2 as a submove (9 out of 58 total instances). In EEMRA and EIMRA texts, however, this move was realized by utilizing M1S2 in more occurrences of move 1 (20/52 and 14/42, respectively). In other words, the PIMRA authors systematically withdrew from referring to or highlighting the main research problem in their Introductions.

The following are some examples of move 1 and its submoves from the three groups in the corpus (hereafter, the distinguishing features of the moves are boldfaced):

1. People who self-harm **have** an increased risk of premature death: **studies from the 1980s** showed that risk of suicide was 25 times greater, accidental death seven times higher, and death from natural causes two times greater in individuals who self-harm than in the general population¹. Subsequent studies²⁻⁷ **established** that all cause and natural-cause mortality was increased in people who self-harm. (EEMRA, Text 5, M1S1)
2. **In occupational settings**, chronic lead intoxication **is** a slow and insidious disease with variable manifestations. Fatigue, apathy, irritability, and vague gastrointestinal symptoms **are** early signs of chronic lead intoxication¹. Long-term exposure can result in lead neuropathy. The classic form of lead neuropathy **consists of** weakness primarily involving the wrist and finger extensors^{1,2}. (EIMRA, Text 26, M1S1)

3. کمردرد یکی از شایع ترین دلایل ویزیت پزشکان با بار بالای اجتماعی-اقتصادی است.

... اما مطالعات نشان می دهد که استفاده بیش تر از تصویربرداری پیشرفته با بهبود پیش

آگهی در این بیماران همراه نبوده است¹. (PIMRA, Text 2, M1S1)

3. Kæmærdærd jeki æz ʃɔjeʔtærin dælbjele vizite pezeʃkɒn bɒ bɒre bɒlɒye edztemʔi-eg tesɒdist.æmɒ motleʔɒt nefɒn midæhæd ke estefɒdeje biʃtær æz tæsvirbærdɒrije piʃræfte bɒ behbude piʃɒgæhi dær in bimɒrɒn hæmrɒh næbude æst.

*(Low back pain **is** one of the most common reasons for visits to doctors, having high socioeconomic burdens However, studies **show** that more advanced imaging has not been associated with the improvement of prognosis in patients¹.)*

4. Cardiovascular disease (CVD) **accounts for** most deaths in patients with diabetes mellitus (1-3). Randomized trials have evaluated CVD risk associated with selected thresholds of glycemic control (4, 5), but how specific antidiabetic drugs contribute to CVD risk **is** less clear. Some studies **found** that thiazolidinediones increased CVD risk compared with placebo or active comparators **(6-8)**, (EEMRA, Text 7, M1S2)

5. However, with routine CT images constructed by linear processing, early diagnosis of the ischemic stroke **faces** some shortcomings^[6]. (EIMRA, Text 25, M1S2)

6. این برنامه پرتودرمانی طولانی معایب بسیاری مانند ناراحتی بیمار، هزینه های بالاتر درمان، حجم کار بیش تر و بار زیادتری برای دستگاه های رادیوتراپی **دارد**.⁷⁻¹⁰ این کاستی ها، البته نه همه، را می توان با برنامه پرتودرمانی کوتاه تر، کم کرد که هم به سود منابع و هم بیماران **است**. (PIMRA, Text 1, M1S2)

6. in bærnmeje pærtodærmnije tulni mæ?jebe besjori mænænde nrøhætije bimor, hæzinehje bbløtre dærmøn, hædzme kore bißtær væ bre zijødtæri bærnje dæstgøhhje rødioteropi dbræd. in kbstihv, ælbæte næ hæme, rø mitævn b bærnmeje pærtodræmnije kutøhtær, kæm kærd ke hæm be sude mænøbe? væ hæm bimørøn æst.

*(This long-term radiation **has** many disadvantages such as the patient's discomfort, higher treatment costs, more work and higher loads for the radiation devices. These shortcomings, of course not all, can be mitigated through a shorter radiation plan, which is to the benefit of both the resources and the patients.)*

3.1.2 Move 2: Reviewing related literature

Providing information against which the reported research can be evaluated, this move begins to set the stage for more development of the discourse in experimental RAs. In fact, move 2 aims at establishing a place for the new research within a much broader lively context of which the present study is claimed to be a part. In other words, this move provides validation of a new study by referring to the established works in the field or by detailing perceived limitations in the extant literature (Sheldon, 2011).

Thus, the two units of information in this move (i.e., reference to previous research and reference to limitations of previous research) can be illustrated by the following examples from the corpus:

7. **In prospective cohort studies**, increased nut intake has been associated with reduced risks of type 2 diabetes mellitus,¹⁴⁻¹⁶ the metabolic syndrome,¹⁷ colon cancer,¹⁸ hypertension,¹⁹ gallstone disease,^{20,21} diverticulitis,²² and death from inflammatory diseases.²³ (EEMRA, Text 18, M2S1)

8. In fact, **numerous studies** have shown people with the MetS are more likely to die prematurely and that they are at the greater risk of developing diabetes mellitus and cardiovascular disease^[4,5] (EIMRA, Text 28, M2S1)

9. در حال حاضر و با توجه به نتایج مطالعات، به طور عمده از ایبوپروفن (5,5,10mg/kg) به ترتیب روزهای 1، 2، و 3 برای بستن PDA استفاده می شود⁶⁻¹⁰، ... (PIMRA, Text 3, ... M2S1)

9. Dær hble hþzer væ bþ tævædʒoh be nætþjedʒe motþleþt, be tore omde æz iboporofen (be tærtibe ruzhþje 1, 2 væ 3 bærnþje bæstæne 5, 5, 10mg/kg PDA) estefþde mifævæd.

(Currently, and **with respect to the results of the studies**, Ibopropfen (5, 5, 10mg/kg) is mainly used to close PDA⁶⁻¹⁰.)

10. While genetic factors are estimated to contribute 50%–80% of the risk of developing an ED⁽²⁾, to date, several studies using both genome-wide analysis^(3, 4) and candidate gene⁽⁵⁾ approaches **have failed to identify** specific genes that predispose to the development of an ED. (EEMRA, Text 22, M2S2)

11. **No such studies** on the HCV genotyping **are available** from this region of Iran. (EIMRA, Text 12, M2S2)

12. با توجه به اینکه تاثیر دریافت کلسیم بر وزن بدن، فشار خون، مقاومت انسولینی و پروفایل چربی هنوز مورد بحث است، تصمیم بر آن شد تا (PIMRA, Text 20, M2S2)

12. bþ tævædʒoh be inke tæʒsire dærjþfte kælsiom bæ r væzne bædæn, feþre xun, mogþvemæte ænsolini væ porofþjle tþærbi hænuz mowrede bæhs æst, tæsmim bæ r þn þod tþ

(Since the effect of calcium intake on body weight, blood pressure, insulin resistance and lipid profile **is still under discussion**, it was decided to)

As seen in the abovementioned illustrations, the RA writers tended to deploy certain linguistic features to characterize this move: the use of simple past tense verb forms when reference to a single research is aimed (*Zwaan et al. investigated the contribution of . . .*), the use of present perfect tense verb forms when reference to more than one research event is intended (*In prospective cohort studies, increased nut intake has been associated with*), the use of simple present tense verb forms when more than one event is mentioned and their results bear implications for the new research (*No such studies on the HCV genotyping are available from this region of Iran*), and finally the use of adversative adverbial

conjuncts as well as negative forms when a signal to a new direction or reference to a gap is intended (*approaches have **failed** to identify specific genes*). Similar to move 1, nonintegral citation was noted throughout move 2 in the corpus. However, fewer cases of integral references were also observed. To emphasize the need for new research (specifically in M2S2), this move features other modal finites expressing obligation (e.g., *must* and *should*) as well as some epithets stressing necessity, importance, or value (e.g., *essential*, *important*, *crucial*). Table 4 illustrates the distribution of move 2 and the related submoves across the entire corpus:

Table 4. *Summary of Occurrences of Move 2 and Its Submoves*

Structure of Move 2	EEMRAs No. (%)	EIMRAs No. (%)	PIMRAs No. (%)
Instances of Three Moves	141 (100)	157 (100)	184 (100)
Instances of Move 2	63 (44.68)	72 (45.85)	95 (51.63)
M2S1	44	55	72
M2S2	19	17	23
RAs With This Feature	30	27	30

A more detailed analysis of move 2 in the Introduction sections of all the three groups revealed some authors' employment of a submove which resembled M2S2 (i.e., expressing limitations of previous research). It was, however, different from M2S2 in that it tended to be used to express the limitations quite implicitly, making the stage ready for a communicative function typically represented by move 3 (i.e., presenting new research). Although this submove prompts a required room for the final move in the Introduction sections, it neither highlights a gap nor provides a negative evaluation of the previous research. If we accept that writing is socially constructed, embedded in cultural traditions, this resistance to highlighting the niche on the part of the EIMRA group (as shown in Table 4) suggests that the L2 texts may have been influenced by their L1 written culture, as demonstrated by Mauranen (1993) and others (Ahmad, 1997; Moreno, 2010). In fact, Nwogu's framework seems to be lacking a transition from reference to limitations of previous research (i.e., M2S2) to reference to research purpose (i.e., M3S1). We argue that a smooth transition is provided by what can be termed the M3-prompting submove, which is similar to an optional move 2 step (step 2: presenting positive justification) identified by Swales (2004). Below are some examples from this new category found in the corpus:

13. It is necessary to evaluate strategies that increase the efficacy of influenza vaccination in HIV-infected persons. Higher doses of antigen have been associated with higher antibody titers in other poorly responsive populations, such as elderly adults (31-33). We hypothesized that . . . (EEMRA, Text 11, M3-prompting submove)

14. Therefore, it is necessary to balance the healing potencies and toxic effects of each nanosilver contained wound dressing on skin and other organs before any clinical use (10,11). We aimed in the present study to (EIMRA, Text 16, M3-prompting submove)

15. از آنجا که مادران باردار ممکن است از این دارو به عنوان ضدالتهاب، ضد درد و تب بر استفاده نمایند و این دارو به جنین آنها انتقال یابد، لذا این مطالعه به منظور (PIMRA, Text 4, M3-) (prompting submove)

15. æz ʊndʒʊ ke mɒdærne bɔrdɔr momken æst æz in dɔru be ɒnvɒne zede eltehɒb, zede dærd væ tæbbɔr estefɒde næmɒjænd væ in dɔru be dzænine ɒnhɒ entecɒl jɒbæd, lezɒ in motɒleʔe be mænʒure

(Because pregnant women may use this medication as an anti-inflammatory, analgesic and antipyretic drug, and that the drug may be transferred to the fetus, this study was conducted to)

Despite the fact that the writers in all groups appealed to this submove in their Introduction, the frequency with which it was used differed across the groups as illustrated in Table 4. Following Swales' criteria for a stable move or submove (occurrence in 50% of the corpus), M3-prompting submove did not qualify as a submove for the EEMRAs and the PIMRAs (see Table 5):

Table 5. Frequency of M3-Prompting Submove Across the Groups

Groups	EEMRAs	EIMRAs	PIMRAs
M3-Prompting Submove	6/30	3/30	7/30

3.1.3 Move 3: Presenting new research

The primary function of this move is to present the research in question mainly by stating the purpose(s) of the study. Further to stating the research purpose, move 3 may also provide information regarding the primary methods of investigation adopted by the study (Nwogu, 1997). Put differently, this move swiftly fills the gap already identified in move 2 by explicitly outlining the research purpose, and in some cases, stating its structure through making reference to the sample data on which the study is based. In terms of Nwogu (1997), reference to research purpose is the dominant constituent element in move 3, as shown in the following examples:

16. **We sought to compare** the hazard of CVD outcomes and all-cause mortality in patients who initiated metformin and sulfonylurea therapy by using data from a national cohort that allow for control of

important patient characteristics associated with . . . (EEMRA, Text 7, M3S1)

17. **The purpose of this study was to review** our experience with treatment of the late sequelae of septic arthritis of the hip in infants and we present a series of patients with sequelae of SAH. (EIMRA, Text 14, M3S1)

18. بنابراین، پژوهش حاضر با هدف بررسی ارتباط سطح سرمی هورمون آدیپونکتین با عملکرد تیروئید در کم کاری و پرکاری تحت بالینی تیروئید انجام گرفت. (PIMRA, Text 21, M3S1)

18. benbærin, pæzuhefe hæzer bæ hædæfe bærrisje ertebæthe soromije hormone ædiponektin bæ æmælkærde tiroid dær kæmkæri væ porkærije tæhte bælinije tiroid ændæm gereft.

(Therefore, the present study was conducted to investigate the relationship between serum levels of adiponectin hormone with thyroid function in subclinical hypothyroidism and hyperthyroidism.)

19. Consequently, **we conducted a randomized controlled trial to ascertain** whether double dose oseltamivir controls viral replication faster and improves clinical outcomes compared with standard dose in patients admitted to hospital with severe influenza. (EEMRA, Text 25, M3S2)

20. . . . **a parametric model based on** Weibull distribution, when dealing with cross-sectional data, **has been presented to investigate** the result of this phenomenon. Based on this model, the effect of differential mortality from cardiovascular diseases on cholesterol mean has been studied in different age groups. (EIMRA, Text 18, M3S2)

21. این مطالعه با حذف عوامل موثر بر آستانه کانتراست مانند سن، عیوب انکساری و بیماریهای سیستمیک مانند دیابت صورت گرفته است تا بتوان تاثیر دوز دسفرال و مدت تزریق خون و میزان فریتین خون را بر آستانه کانتراست بررسی کرد. (PIMRA, Text 9, M3S2)

21. in motæle bæ hæzfe ævæmele moæsser bæ æstoneje konteræst mænænde sen, æjube enkesæri væ bimærihæje sistemik mænænde dijæbet suræt gerefte æst tæ bæævæn tææsire doze disæfræl væ moddæte tæærice xun væ mizæne feritine xun ræ bæ æstoneje konteræst bææresi kærd.

(This study eliminated factors affecting the contrast threshold, such as age, refractive errors and systemic diseases like diabetes to make it possible for the researchers to investigate the effect of deferral dose

and the duration of blood transfusion and blood ferritin level on contrast threshold.)

Table 6 presents the occurrences of this move and the respective submoves in the corpus:

Table 6. *Summary of Occurrences of Move 3 and Its Submoves*

Structure of Move 3	EEMRAs No. (%)	EIMRAs No. (%)	PIMRAs No. (%)
Instances of Three Moves	141 (100)	157 (100)	184 (100)
Instances of Move 3	36 (25.53)	33 (21.01)	31 (16.84)
M3S1	29	29	30
M3S2	7	4	1
RAs With This Feature	30	30	29

3.2 Metadiscourse Markers

The metadiscourse markers were analyzed in terms of interactive (including transitions, frame markers, endophoric markers, evidential markers, and code glosses), and interactional (including hedges, boosters, attitude, engagement, and self-mention). The overall results revealed that these metadiscourse markers were used by the three groups but in varying proportions. Whereas the three groups were more or less similar in terms of the interactive metadiscourse markers, the interactional metadiscourse markers in the EEMRA texts outnumbered their counterparts in the EIMRA and PIMRA texts. The results are summarized in Table 7:

Table 7. *Summary of Occurrence of Interactive Metadiscourse Markers Across Three Groups*

	Interactive				
	Transitions	Frame	Endophoric	Evidentials	Code glosses
EEMRAs	213 (27.9%)	188 (24.62%)	52 (6.81%)	221 (28.95%)	88 (11.52%)
EIMRAs	221 (28.06%)	179 (22.73%)	49 (6.22%)	239 (30.35%)	98 (12.44%)
PIMRAs	208 (27.87%)	183 (24.52%)	54 (7.23%)	215 (28.81%)	85 (11.39%)

As can be seen in Table 8, in terms of hedges, attitude, and engagement markers, there were considerable differences between the Iranian texts (i.e., EIMRAs and PIMRAs) and those written by EEMRA writers. Whereas the percentages with which the EEMRA writers employed these markers were 27.19%, 15.45%, and 8.03% for the three categories, respectively, the EIMRA writers used these devices in 31.55%, 10.94%, and 4.5% of all their deployment of metadiscourse markers. The same percentages were found to be 18.39%, 10.51%, and 4.67% for the PIMRA writers:

Table 8. *Summary of Occurrence of Interactional Metadiscourse Markers Across Three Groups*

	Interactional				
	Hedge	Booster	Attitude	Engagement	Self-Mention
EEMRAs	132 (27.19%)	183 (37.69%)	75 (15.45%)	39 (8.03%)	56 (11.53%)
EIMRAs	98 (31.55%)	123 (39.6%)	34 (10.94%)	14 (4.5%)	41 (13.2%)
PIMRAs	63 (18.39%)	163 (47.59%)	36 (10.51%)	16 (4.67%)	64 (18.68%)

4. Discussion

4.1 Rhetorical Structure

The aim of this study was to ascertain whether or not the textual organization of medical RA Introductions in a Persian context (both for EIMRAs and PIMRAs) could be explained by the Nwogu's (1997) framework. In other words, the aim of this study was to see whether or not the English L2 and the Persian L1 texts complied with what Nwogu (1997) presented as a model for medical RAs. One major focus of the present study was on the rhetorical variations in the Introduction sections of medical RAs, looking at genre, moves, and steps.

The results from the three-way analysis across the two languages are intended to promote international academic discourse in a cross-cultural context. In particular, the inclusion of the PIMRA group allows a more nuanced approach to the textual characteristics of the Introduction sections, facilitating international publication and recognition by giving explanations in terms of the impact of different conventions or of traditional views of L1 culture and the way culture impacts the way these writers contribute to knowledge.

The results show that moves 1 and 3 are mandatory components in the writing of the three groups, being present in 96.6-100% of all the Introductions. With regard to move 2, the EEMRA and the PIMRA groups appear to have conventionalized this move, as it is a constant rhetorical feature of the Introduction sections, reaching 100% of all the Introductions which means that all the writers have consistently used this move. The EIMRA group, however, has not employed this move consistently to refer to previous studies, which is rather odd and contrary to what Nwogu (1997) has found on the distribution of the moves in his study. Also, the results are different from those of Sayfoury (2010) wherein the Iranian RAs employed significantly fewer number of submoves 1.2 (reference to main research problems), 2.2 (reference to limitations of previous research), and 3.2 (reference to main research procedures) in their Introduction sections compared to the native English RAs.

Overall, the results revealed that the rhetorical structures (i.e., moves and submoves) of the three groups of texts are not a fully qualified site for a thorough discussion of Iranian scholars' difficulty in publishing in English international

journals of medicine. It seems the Introduction sections of the three groups of the RAs were similar regarding their move frequency, but the realization of these three moves was radically different in these two languages. Therefore, in order to better conceive of these different realizations, we examined the metadiscourse markers used in the different moves and submoves of the Introduction sections of the three groups.

4.2 Metadiscourse Markers

As an important part of scientific writing, an author has to create and maintain an authorial presence through certain rhetorical devices. In this study, the metadiscourse markers were coded according to Hyland (2004).

The interactive and interactional metadiscourse analysis of the corpus of the present study indicated that the writers of all three groups used all subtypes of metadiscourse in their writings, but to varying proportions. This finding shows the universal nature of metadiscourse use. Generally speaking, the interactive metadiscoursal factors were used significantly more than the interactional metadiscoursal factors in the Introduction sections of the RAs. Moreover, the native speakers of English employed more interactional metadiscourse than the Iranians.

One argument that may account for these findings is the role of L1 culture. However, what is not sure is the way the Iranian culture contributes to the use of metadiscourse in academic writing; in fact, the findings of different studies are mixed in this regard. For instance, whereas Abdi (2009) believes that the conventions of employing interactional metadiscourse markers (e.g., engagement markers) are a function of national culture rather than generic and discursive norms of the broader academic community, Shokouhi and Talati Baghsiahi (2009), who investigated the metadiscourse functions in sociology RAs in Persian and English, contend that the Persian writers are less interested in explicitly organizing the texts and orienting to the readers. That is, as far as Abdi (2009) is concerned, the Iranian culture leads the writers' use of interactional metadiscourse markers, yet the same culture makes them negligent of explicit organization of texts according to Shokouhi and Baghsiahi (2009).

While accepting the influence of L1 culture on the metadiscourse of RAs, in general, and the moves, in particular, we believe that the differences between the EIMRA and PIMRA texts regarding both interactional and interactive metadiscourse markers were predominantly motivated by the writers' awareness of the discursive expectations of the certain discourse community in which they are active in order to gain acceptance and gradually become established members of those communities. However, the difference between these writers, that is, the Iranian writers (i.e., EIMRAs and PIMRAs) and the English L1 writers (i.e., EEMRAs) was in terms of

the way they opted for the metadiscourse devices they had at their disposal to meet those expectations. For example, the EEMRA texts tended to include a higher number of hedging devices whereby direct or sweeping statements are softened and/or the proportion of attitude markers is reduced. These qualities have the effect of lessening the reader's impulse to disagree. In this way, they soften or mitigate the directness of their statements. Through hedging, and particularly softening their statements, the scholars lessen the opportunities for the reader to challenge their assertions, as the assertions themselves are less bald. Examples include the use of *likely*, *could be*, *seem*, and so on. This was particularly evident in the M2S2 submove wherein reference to limitations of previous research is made with careful caution.

However, and as seen in most PIMRA and EIMRA texts, the use of existential introductory clauses such as *it is clear that* or *there is no doubt that* abounds. Such statements, in their attempt to direct the reader's assessment, actually provide an opportunity for the reader to disagree. It is not surprising that this high level of usage of such statements downplays the reader interactivity in the EIMRA and PIMRA texts. In fact, the tenor of a scientific text is to present a truth that is to be accepted, not challenged (Hanauer, & Englander, 2013).

It is important to note that adjusting claims to the intended level can be especially difficult for nonnative speakers of English. Lack of familiarity with these resources of academic discourse may cause huge difficulties for the Iranian scholars who seek membership in a disciplinary community. Given the astonishingly wide array of linguistic possibilities for stating one's knowledge claims, the writer's options in formulating the claim are decidedly complex.

To make things worse, when it comes to combining modals with other hedging devices, the writers are overwhelmed by the further subtlety, as in something "may seem to indicate" or something "could possibly be explained by" something else (Englander, 2014, p. 32). This can be the result of two related phenomena. One difficulty is that the conventions of what is the appropriate amount of hedging or boosting can be different in another language community than the conventions of English science writing. The decision must take into account not only the level of generalization and level of certainty that the writer wishes to make, but it must also be acceptable to the journal editors and reviewers who determine the paper's acceptability for the journal's readers. Therefore, it seems necessary to devote special attention to the teaching of these resources to novice scholars. Our understanding of this also needs to be sharpened by doing further research in this area of rhetorical competence.

The existing differences can be further attributed to the Persian rhetoric. According to Hinds (1987), there are two kinds of rhetoric: writer-responsible and

reader-responsible. In the former, it is the writer who is primarily responsible for effective communication and this is done by using a number of rhetoric devices. In the latter, however, the interpretation of the text is left to the reader. Therefore, “while in Persian writing, a reader-responsible language, writers use a less hedged discussion and readers are assumed to infer much from the text, English texts, writer-responsible, allow more hedges in discussion and guide readers through the text” (Jalilifar, 2011, p. 184).

5. Conclusion

As far as the rhetorical structures (i.e., moves and submoves) of the three groups of texts investigated in the present study are concerned, being unaware of these structures cannot be a fully eligible discussion for the Iranian scholars’ difficulty in publishing in English international journals of medicine. This is because the three groups of RAs were similar regarding their move frequency. However, what makes these groups different is the realization of these three moves in the two languages, namely English and Persian. One very important area of realization was deemed to be the metadiscourse markers used in the different moves and submoves of the Introduction sections of the three groups. The analysis of these markers shows these particular meaning resources in the analyzed RAs were aimed to achieve a number of functions which are in line with previous research (e.g., Fryer, 2012; Gledhill, 1995; Nwogu, 1997; Skelton, 1994). As far as the EEMRA texts are concerned, these mainly included projecting an image of honesty and humility (Swales 1990), tentatively conveying propositions to make them less challengeable by readers (Salager-Meyer, 1994), and expressing positive and negative politeness (Myers, 1989; Varttala, 1999). However, the writers of PIMRAs and EIMRAs tended to be less cognizant of these concerns, and their texts were hardly furnished with markers representing those functions. Therefore, when making claims, hypothesizing, explaining, or asserting empirical evidence, these authors are expected to exercise great caution to show that they care about their readers because their propositions may be interpreted as impolite or unwarranted if not expressed in an acceptable manner.

Two important implications could be put forward here. First, it is advisable for Iranian medical scholars to raise their awareness of the existence of metadiscourse markers. This is because although these markers are used at a very high rate in academic medical RAs and help the writers develop their argument in writing tasks, Iranian medical writers are not very proficient in this regard. Hedges, attitude, and engagement were shown to be used more frequently in EEMRAs than in the other two groups; as a result, these markers should be paid much more attention to. Of course, their presence simply does not make a text more scientific in Persian. Given the language specific characteristics of Persian, these textual

properties should be taught in light of what is linguistically acceptable in Persian, rather than what is academically and linguistically felicitous in English. This seems to be especially true for the writers in the EIMRA group who follow what is academically and linguistically acceptable in English. As far as ESP materials developers and instructors are concerned, we suggest that these specific metadiscourse markers should be taken into account in developing and choosing reading and writing materials for students.

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