

Interactive Markers in Medical Research Articles Written by Iranian and Native Authors of ISI and Non-ISI Medical Journals: A Contrastive Metadiscourse Analysis of Method Section

Fariba Ghadyani

Sheikh-e-Bahae University, Isfahan, Iran

Mohammad Hassan Tahririan

Sheikh-e-Bahae University, Isfahan, Iran

Abstract—The present study is concerned with the issue of whether there were any significant differences between the two groups- Iranian writers of ISI and non- ISI medical journals- in terms of the number and types of interactive markers. To this end, a corpus of 90 'method sections' of ISI and non- ISI English medical research articles written by Iranian and non- Iranian writers published between 2005 and 2010 were selected. Then, Hyland's (2005) taxonomy of metadiscourse markers was used as the model of analysis. After performing detailed quantitative and qualitative analyses of interactive markers, Chi- Square tests were run. Although the different groups of writers were found to have employed all sub-types of interactive markers, they were different by the use of them. The findings revealed significant differences between the ISI and non-ISI groups in binary comparisons ($p=0.05$). The differences may be attributed to the writers' mother tongue, culture and also to their lack or limited awareness of the rhetorical conventions of English medical academic research writing.

Index Terms—metadiscourse analysis, interactive marker, method section, medical research article, Iranian, ISI journal

I. INTRODUCTION

The dominance of English as the international language of research (Swales, 2004), has been established it as the language for research publication purposes in many disciplinary fields. On the other hand, language manifests itself into particular features of its own in different disciplines that create different genres and each discipline shares mechanisms of intercommunication among its members through, for instance, professional journals (Swales, 1990). Furthermore, research article (RA) genre was correctly glossed by Montgomery (1996) as 'master narrative of our time' (swales, 2010), that is, the scientist through RA genre as a form of persuasive writing attempts not simply to present new claims, but to ensure that those claims are accepted and ratified as new knowledge by the disciplinary community (Livnat, 2012). The latter is just the final rhetoric aim of RAs insomuch as Prelli (1989) claims that writing persuasive scientific academic texts, per se, in second or foreign language writing for being accepted, and published in particularly, internationally indexed or prestigious journals is a fundamental means of securing scientific change (Livnat, 2012). Medicine is no exception to this rule as medical research articles are the genre, the mastery of which is very important to the professional success of researchers. In fact, as Swales (1990) maintains, authors of medical research articles are required to know how to write in accordance with the social aims, the norms, and the conventions of their discourse community.

Theoretically, Hyon (1996) argues that genre scholarship has taken significantly different paths: a) English for specific purposes (ESP), b) North American New Rhetoric, and c) Australian systemic functional linguistics. His investigation (1996) reveals that ESP and Australian genre research provide ESL instructors with insights into the linguistic features of written texts as well as useful guidelines for presenting those features in classrooms. Hyon (1996) also argues that New Rhetoric scholarship offers language teachers fuller perspective on the institutional contexts around academic and professional genres and the functions genres serve within these settings.

Dudley-Evans (1998) in 'Genre studies in English for academic purposes' states that ESP genre analysis has its origins in Swales' (1981, 1990) seminal work on introductions of academic articles and then most of the work were done on written genre, as these are much more accessible and portable. Moreover, different types of genres in academic written English including textbooks, different sections of research articles, acknowledgements, theses and dissertations, and their titles and also in spoken genres as conference presentation were analyzed in various EAP fields of study.

As the literature in the area of contrastive genre analysis suggests, medical RAs published in ISI journals have not been studied for employing metadiscourse features. Furthermore, 'method section' of RAs has been paid the least attention in this regard. However, it should not lead us to think that writing 'method section' is relatively uncomplicated (Swales 2004) and 'method section' has been largely ignored while methods and procedures determine the ways in which other sections are constructed, and they give corporeal substance to the ideas, and produce certain kinds of data in certain amounts to make certain claims possible (Swales, 2010). Moreover, editors of major journals often operate 'methodological screens', and reject out of hand submissions that do not meet their methodological expectations (Swales, 2010).

Based on the abovementioned grounds, this study was conducted to contribute to evaluating academic medical journals, and would form a strong basis in understanding them linguistically in terms of interactive markers to exploit the outcomes for pedagogical goals and planning appropriate materials for explicit teaching of writing medical RAs.

II. MATERIAL AND METHODS

A. *The Corpus*

This study examined 90 'method sections' of English medical research articles in English, having the standard IMRD structure published in ISI and non-ISI journals. They comprised the three study groups: Native, Iran ISI, and Iran non-ISI groups. Each of them consisted of 30 articles selected respectively from ISI Native journals, ISI Iranian Journals, and non-ISI Iranian journals. Thus, three groups of medical journals constituted the corpus of the study as follows:

1-English medical journals published in English native speaking contexts selected from among a ranking list at (SCImago) at the website of SJR including the highest impact and prestigious journals because popularity and prestige were both taken into consideration.

2-ISI Iranian medical journals selected from among a ranking list at (SCImago) under the title of Iranian journals indexed in international website of SJR.

3-Iranian non-ISI medical journals selected from among the general list of Scientific Information Database (SID) Articles Published in Iran.

To balance out the problem of peculiarities of writers' styles, these articles have been selected through stratified random sampling. Moreover, the same numbers of articles, that is, 5 articles were selected randomly from each journal regardless of their differences in terms of the frequency of annual publications.

B. *Justification for Selecting ISI and non-ISI Groups of Journals*

Selecting ISI journals was carried out since they have always enjoyed the highest degree of prestige and credibility. Linguistically, ISI journals are particularly the product of implementing the rhetorical styles of the authors of the articles and also of the editors of the journals. Consequently, as expected, these journals publish articles with the highest quality of content and rhetorical styles. Taking the above-mentioned assumptions into account, discovering the probable differences between these two groups of medical articles may help the ESP academic writing planners to improve teaching materials and techniques as for medicine research article writing.

C. *Justification for Selecting 'Method Section'*

Functional homogeneity among the corpus of study is of great salience. Thus, to provide reliability and also content validity of the corpus and also in order to extend the findings of the study to other articles of the corpus, a particular section as 'method section' of IMRD structure was chosen for the analysis of metadiscourse features within medical research articles.

D. *Process of Random Selection of the Corpus*

The choice of research articles was based on a number of criteria; the first criterion was, having experimental design in order to have homogeneous data because research articles in medicine mainly deal with experimental research. The second criterion was, having IMRD structure. Then, the research articles were all restricted to those published within 2005-2010 with the assumption that time influences the style of the writers. To increase the external validity of findings, the articles were selected irrespective of medical specialty, that is, they were of diversity in subject as possible. Random selection was carried out 18 times for the 18 types of the journals to select 5 articles from each journal by means of *stattrek* stratified random sampling at (<http://stattrek.com/Tables/Random.aspx>).

E. *Instrumentation*

1. **The Framework of the study**

This study used Hyland's (2005) taxonomy of metadiscourse markers as the model of analysis. He has provided the probably most comprehensive framework for the study of metadiscourse and it is specifically named a model of metadiscourse in academic texts (Hyland, 2000; Hyland, 2005). He (Hyland, 2005) argues that metadiscourse does not simply uphold propositional content as it is the means by which propositional content is made coherent, intelligible, and persuasive to a particular audience. Therefore, Hyland's (2005) model recognizes that metadiscourse is comprised of the two dimensions of interaction: 1) The interactive dimension which concerns the writer's awareness of a

participating audience and the ways he or she seeks to accommodate its probable knowledge, interests, rhetorical expectations and processing abilities and the use of resources in this category addresses ways of organizing discourse and 2) The Interactional dimension which deals with the ways the writers conduct interaction by intruding and commenting, that is, metadiscourse here is evaluative, engaging, expressing solidarity, anticipating objections and responding to an imagined dialogue with others.

These two macro-categories were previously referred to as textual and interpersonal, respectively by Halliday in the systemic functional grammar. The change of labels was put forward by Hyland who claims that all metadiscourse needs to be conceptualized as an interpersonal feature of communication 'in that it takes account of reader's knowledge, textual experiences, and processing needs (Hyland, 2010; Hyland 2005; Hyland and Tse, 2004).

F. Procedure of the Study

1. Performing Pilot Test

Performing pilot test at first stage demonstrated some significant differences as for the employed interactive markers between the mentioned study groups. Based on the feedback from the pilot test, the study was conducted completely using the Hyland's (2005) Model. The metadiscourse analysis of the articles was conducted through analyzing 'method sections' of all the medical articles to explore the frequency of the employed sub- types of interactive markers within them. Then, it was followed by qualitative stage.

2. Quantitative Procedure

A list of 267 potentially productive searched metadiscourse items to express the sub-types of interactive resources (Appendix) was compiled based on previous research on metadiscourse features (e.g. Hyland, 2007; Vazquez & Giner, 2009), and on a careful study of the corpus themselves for eliciting the most frequently occurring items in the articles being examined.

The research articles in PDF format were converted to text form by the Simpo PDF Converter software. Then, the texts were converted to an electronic corpus of 81,562 numbers of words using MAXQDA text analysis software and searched for the frequency of the specific features.

3. Qualitative Procedure

The results of the quantitative stage in the research articles were examined in the context to ensure the multi-functionality nature of interactive markers in method sections to verify the validity of the results and a small sample was double-checked by a colleague working independently to verify the results to attain the reliability of the findings.

4. Performing normalization

The frequencies of the interactive markers totally and individually as well as the total number of words were obtained. Since consistency of the length of the articles is a 'must' to make the results comparable, the obtained data was calculated in 10,000 words.

5. Intra-rater and Inter-rater Reliability

To determine inter- rater reliability, method sections of 90 randomly selected articles were analyzed by the researcher. Then, a small sample of the same articles analyzed by a colleague of the researcher- an M.A. holder of TEFL- who received sufficient training in doing the task. The obtained value of Spearman's correlation coefficient (ρ) between the two ratings ($r=0.81$) was an estimate of the high inter- rater reliability of the judgments made by the researcher and the rater. Furthermore, the second analysis of the same sections of the same articles by the researcher was done at a two weeks interval. The calculated correlation between the two results by the researcher ($r=0.83$) was an estimate of high intra- rater reliability of the judgments made by the researcher on two different times.

G. Data Analysis

Inasmuch as the research questions concerning the metadiscourse analysis of the present study dealt with sets of binary comparisons including Native /Iran ISI, Native/Iran non- ISI, and Iran ISI/ Iran non- ISI, sets of statistical tests were performed on the data, that is, chi-square tests were run between the pairs of frequency counts concerning single sub-types of interactive markers individually, in order to examine probable significant differences between them to test the hypotheses of the present study.

1. Hypotheses of the study

1- There is no significant difference in employed interactive markers between medical ISI and non-ISI articles written by Iranian writers.

2-There is no significant difference in employed interactive markers between medical ISI articles written by Iranian writers and those written by native speakers of English.

2. Research questions

2.1. Metadiscourse Approach to ESP Genre Studies

1-What are distinctive features of medical articles written by Iranian writers in ISI and non-ISI journals as for employing interactive markers?

2-What are distinctive features of medical ISI articles written by Iranian writers and those written by native speakers of English as for employing interactive markers?

H. Variables of the Study

1. The Dependent Variables

The frequency of each sub-type of interactive markers used in method section of medical research articles by the three groups of writers.

2. The Independent Variables

The rhetorical aspect of using sub- types of interactive markers in ISI, and non- ISI medical research articles within the study groups.

III. RESULTS

Totally 3,657 instances of interactive markers were exploited within the corpus of the study. The Native group has employed 2,010 instances of interactive markers. The Iran ISI and the Iran non- ISI groups have employed 929 and 718 instances of interactive markers respectively (Table3.1). These findings are more clearly evident by a bar graph below (chart 3.1).

TABLE 3.1
FREQUENCY RATES OF THE FIVE SUB -TYPES OF INTERACTIVE MARKERS INDIVIDUALLY, AND THOSE OF TOTAL INTERACTIVE MARKERS (THE RAW DATA)

| Sub-types Of Interactive Markers | The Study Groups | | | Total |
|----------------------------------|------------------|----------|---------------|-------|
| | Native | Iran ISI | Iran Non- ISI | |
| Code glosses | 318 | 161 | 138 | 617 |
| Evidentials | 173 | 95 | 46 | 314 |
| Transitions | 881 | 477 | 282 | 1640 |
| Frame markers | 66 | 26 | 36 | 128 |
| Endophorics | 572 | 170 | 216 | 958 |
| Total Interactive Markers | 2010 | 929 | 718 | 3657 |
| Total words | 46944 | 16230 | 18388 | 81562 |

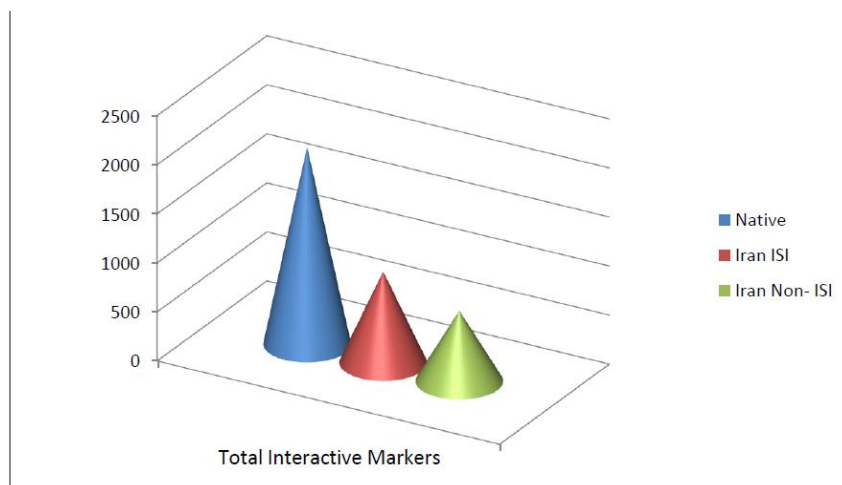


Chart 3.1 Bar graph representing total number of interactive markers across 'method section' of medical research articles used by the study groups

Statistically, the number of interactive markers, totally and individually were calculated per 10,000 words (Normalization). The Native group employed 428.17 instances of interactive markers, totally. The Iran ISI group with a total number of 572.40 instances for interactive markers stood in the highest position; however, the Iran non- ISI group with 390.47 instances of total interactive markers ranked the lowest position among the three study groups (Table 3.2). This is depicted by a bar graph below (chart 3.2).

TABLE 3.2
FREQUENCY RATES OF THE 5 SUB-TYPES OF INTERACTIVE MARKERS INDIVIDUALLY AS WELL AS THOSE OF TOTAL INTERACTIVE MARKERS ACROSS 'METHOD SECTION' OF MEDICAL RESEARCH ARTICLES (PER 10,000 WORDS)

| Sub-types of Interactive Markers | The Study Groups | | |
|----------------------------------|------------------|----------|---------------|
| | Native | Iran ISI | Iran Non- ISI |
| Code glosses | 67.74 | 99.20 | 75.05 |
| Evidentials | 36.85 | 58.53 | 25.02 |
| Transitions | 187.67 | 293.90 | 153.36 |
| Frame markers | 14.06 | 16.02 | 19.58 |
| Endophorics | 121.85 | 104.74 | 117.47 |
| Total | 428.17 | 572.40 | 390.47 |

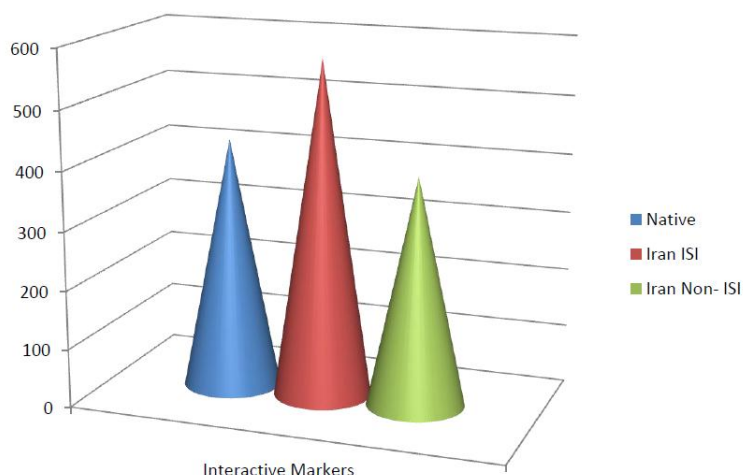


Chart 3.2 Bar Graph representing interactive markers across 'method section' of the medical research articles used by the study groups

Frequency rates of the five sub-Types of interactive markers in percentage terms indicated that transitions comprised maximum percentage of them used in each study group, but frame markers were of minimum percentage of interactive markers employed in each study group (Table 3.3). The findings are best depicted in chart 3.3 below.

TABLE 3.3.
FREQUENCY RATES OF THE FIVE SUB-TYPES OF INTERACTIVE MARKERS ACROSS 'METHOD SECTION ' OF MEDICAL RESEARCH ARTICLES USED BY THE STUDY GROUPS (IN PERCENTAGE TERMS)

| Sub-types of Interactive Markers | The Study Groups | | |
|----------------------------------|------------------|---------------|---------------|
| | Native | Iran ISI | Iran Non-ISI |
| Code glosses | 15.82 | 17.33 | 19.22 |
| Evidentials | 8.61 | 10.23 | 6.41 |
| Transitions | 43.83 | 51.35 | 39.28 |
| Frame markers | 3.28 | 2.80 | 5.01 |
| Endophorics | 28.46 | 18.30 | 30.08 |
| Total | 100.00 | 100.00 | 100.00 |

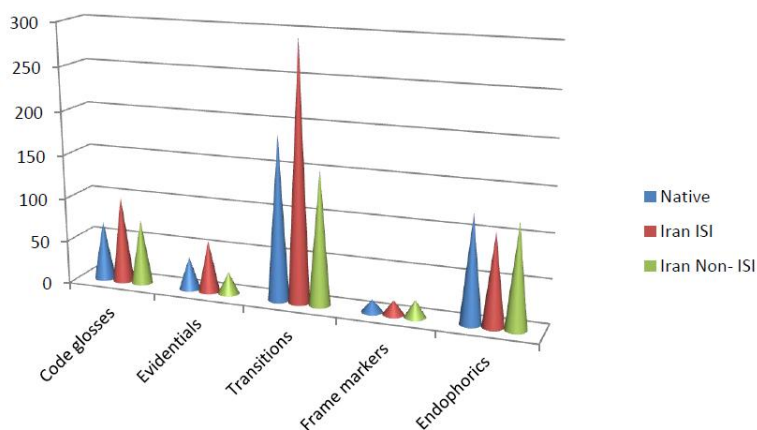


Chart3.3. Bar graph representing the five subtypes of interactive markers individually across 'method section' of medical research articles used by the study groups

Chi- Square tests were run in order to examine probable significant differences between the Native group and the other study groups for employing interactive markers individually. The results showed that there was a significant difference between the Native and the Iran ISI group in this regard (Table 3.4).

On the other hand, Chi- Square tests were run in order to examine probable significant differences between the Iran ISI group and the Iran non- ISI group. The findings indicated that there was a significant difference between the Iran ISI and the Iran non- ISI, for using interactive markers (Table 3.4).

TABLE 3.4

RESULTS OF CHI- SQUARE TESTS OF THE NATIVE WRITERS AND THE OTHER STUDY GROUPS INDIVIDUALLY AS WELL AS OF THE IRAN ISI AND IRAN NON-ISI GROUPS FOR USING INTERACTIVE MARKERS ACROSS 'METHOD SECTION' OF MEDICAL RESEARCH ARTICLES

| | The Binary Comparisons | | |
|----------------------|------------------------|------------------------|--------------------------|
| | Native / Iran ISI | Native / Iran Non- ISI | Iran ISI / Iran Non- ISI |
| Value of Chi- Square | 20.79 | 1.74 | 34.37 |
| DF | 4 | 4 | 4 |
| P | 0.05 | 0.05 | 0.05 |
| N | 1000.57 | 818.64 | 962.87 |

Chi Square tests were run to determine probable significant differences within the binary comparisons including the Native/Iran ISI, Native/Iran non- ISI, and Iran ISI/Iran non- ISI as for employing each sub-type of interactive markers (Table3.5).

TABLE 3.5

RESULTS OF CHI- SQUARE TESTS OF THE STUDY GROUPS INDIVIDUALLY, FOR USING EACH OF THE FIVE SUBTYPES OF INTERACTIVE MARKERS ACROSS 'METHOD SECTION' OF MEDICAL RESEARCH ARTICLES

| Sub-types of Interactive Markers | | The Binary Comparisons | | |
|----------------------------------|----------------------|------------------------|------------------------|--------------------------|
| | | Native / Iran ISI | Native / Iran Non- ISI | Iran ISI / Iran Non- ISI |
| Code glosses | Value of Chi- Square | 5.93 | 0.37 | 3.35 |
| | Number | 166.94 | 142.79 | 174.25 |
| Evidentials | Value of Chi- Square | 4.93 | 2.26 | 13.45 |
| | Number | 95.38 | 61.87 | 83.55 |
| Transitions | Value of Chi- Square | 23.43 | 3.45 | 44.16 |
| | Number | 481.57 | 341.03 | 447.26 |
| Frame markers | Value of Chi- Square | 0.13 | 0.91 | 0.36 |
| | Number | 30.08 | 33.64 | 35.60 |
| Endophorics | Value of Chi- Square | 1.29 | 0.08 | 0.73 |
| | Number | 226.59 | 239.32 | 222.21 |
| | DF | 1 | 1 | 1 |
| | P | 0.05 | 0.05 | 0.05 |

Table 3.5 demonstrated that there were significant differences between the Native and the Iran ISI groups as for employing code glosses, evidentials, and transitions. The findings of Table 3.5 also revealed that there were significant differences between the Iran ISI and the Iran non- ISI group for using evidentials and transitions.

IV. DISCUSSION AND CONCLUSIONS

Despite the discrepancy in employing the five sub- types of interactive markers within the study groups (Native and non- Native groups), it is remarkable that the ranked order of using them is identical within the study groups. On the other hand, as Mauranen (1993a, 1993b) and Vaero-Garces (1996) state different cultural backgrounds of writers have been found to influence the types and the number of employing metadiscourse features. Thus, it may mean that although the writers in the study groups may have different strategies in employing metadiscourse markers due to their different linguistic (L1, and L2 Interlanguage), cultural, educational, and social background, they, to a great degree, follow the same disciplinary culture and write within a unique framework identified by the genre (the 'method section' genre of medical research article genre).

As for employing '**code glosses**', the existence of significance between 'method section' of medical RAs written by the native writers, and those of the Iranian writers in ISI journals demonstrates that the Iranian ISI writers have not been similarly successful in employing code glosses as compared with the Native writers. Lack of significance between the Native and the Iranian non-ISI writers demonstrates the same similarity between 'method sections' of these two study groups in this respect. However, lack of significance between Iran ISI and Iran non- ISI groups shows that both of them have not been similarly successful in employing code glosses in comparison with the Native group. A glimpse at the findings reveals to us that the frequency rate of employed code glosses by the Iran non- ISI group stands roughly between those of the Native and the Iran ISI groups, that is, Iran non- ISI group has been successful merely, to the extent that the group are on the verge of becoming Native- like non- ISI group and has not been successful completely, in this regard.

Hyland (2007) argues that elaboration is a complex and important rhetorical function in academic writing that both its use and meanings vary according to different disciplines. On the other hand, code glosses are metadiscourse signals that demonstrate what the writer assumes an unfamiliar or an ambiguous usage. Thus, it seems that the special nature of 'method section' genre-abound with lists, tables, and diagrams- requires employing more code glosses.

As for employing '**evidentials**' the results indicate that the Iranian ISI group has not been similarly successful in employing evidentials in comparison with the Native group and the Iranian non- ISI groups.

The findings regarding employing evidentials by Iranian ISI and Iranian non- ISI writers suggest that Iranian ISI writers have not had the achievement in employing a normal frequency of evidentials (overusing) in their respective articles as the Native group; However, the Iranian non- ISI writers did indicate that they have been successful in using a normal frequency of evidentials.

The results concerning '**transitions**' demonstrate the same pattern as evidentials, that is, **Iranian ISI writers have not been successful** in employing a normal frequency in their articles as compared with the Native group. However, **the Iranian non- ISI group has achieved in using** a normal frequency of transitions as the Native writers. Moreover, there exists a significant difference between Iran ISI and Iran non- ISI groups in this respect. Transitions are the most frequently occurring interactive feature in 'method section' of medical research articles (187.67 instances per 10.000 words) within the Native group in this study. Transitions within texts indicate their readers how parts of the texts are connected to one another and also how they are organized (Vande Kopple 2002), and they are also the most common interactive markers because texts do not report the work of others and therefore most of the times refer to the internal sequencing of the discourse itself, and make internal relationships clear to specialist readers.

As Shokouhi (2009) states, according to Hinds(1987) frequent use of text connectors in English texts indicates Anglo-American writers' interests in producing more cohesive texts, which it can be a sign of a writer-responsible rhetoric, that is, an English writer provides clues in the texts so that the reader can piece together the logic that binds the discourse together, whereas in Persian, land markers may be weak and it is the responsibility of the reader to determine the relationships between any part of discourse and discourse as a whole. On the other hand, with regard to findings of the study, Iranian ISI writers show overusing code glosses, evidentials, and transitions. Therefore, in agreement with Shokouhi's (2009) argument, it may indicate that the Iran ISI group is more likely interested in explicitly organizing the texts and orienting the readers in order to provide them with the help to understand the text. Though the influence of overgeneralization and interference between English and Persian can be also taken into consideration, Crismore and Abdolhazadeh(2010) argue that the main reason behind indeed overusing interactive markers is that they challenge for being accepted by ISI journals because they may need to compete for a research space because of the much larger size of the discourse community and the increased possibility of audience rejection, thus they use interactive markers (except for frame markers and endophorics) **unconsciously more excessively** in order to gain community acceptance and solidarity with their audience, while the increased use of metadiscourse by learners cannot by itself be a sign of language development.

It is also added that as Rahman (2004) maintains excessive use of metadiscourse can be as disadvantageous as a limited use or no use of such expressions since they may interfere with the reading process and may look imposing and condescending. Further, the writers are aware that without using an appropriate amount of code glosses, evidentials, and frame markers which they bestow credibility to their propositions, their research papers could be seriously questioned (Abdi, 2009), and probably rejected, since reproducibility of 'method section' and research articles are founded on its credibility, clarity, and also its precision. Thus, this is confirmed that Iranian ISI writers need instruction on these three sub-types of interactive markers.

The results regarding employing '**frame markers**' and '**endophorics**' demonstrate the identical pattern as both Iranian ISI and Iranian non- ISI writers suggest have been successful in employing a normal frequency of these two sub-types of interactive markers in their articles in comparison with the Native group.

Frame markers tend to be shorter in 'method section' of medical articles because writers have less need of them to guide readers through a lengthy or complex text. (The average length of 'method section' in the present study: 1600words).

This study attempted to shed some light on neglected genre-'method section'- of medical research articles in ISI (indexed) and non- ISI ones (non- indexed) journals, and the ways native and non- native writers of different nationalities employ interpersonal demands using Hyland's(2005) model of metadiscourse markers. As an overall picture of the present research the Iran ISI and Iran non- ISI groups show an excessive use of code glosses, evidentials, and transitions. Surprisingly, the Iranian non- ISI group demonstrates a better position in employing interactive markers within 'method section' of medical research articles as compared with the Iranian ISI group. Different explanations are offered to account for the differences. It is probable that some of the scholars in non- ISI group have not proceeded to publishing their articles in indexed journals, and if they were on the point of publishing them in high- prestigious journals, they would also become sensitized and overused metadiscourse markers unconsciously as the Iran ISI group did. It is also likely that publishing scientific content of the articles or the writers' affiliation influence over the process of being published in indexed journals.

The results could be used for pedagogical purposes and planning of ESP course for scholars of aimed at raising scholars' awareness of the importance of these rhetorical so that the disciplinary members' expectations are met in international context of publication in English.

Moreover, the results of the present study may contribute to making some revisions to selecting and evaluating international and national journals by preparing international disciplinary-oriented checklists for this purpose to achieve more reliable and valid outcomes in this regard. On the other hand, the results of the study could be discussed and also particularly, studied with regard to background cultural and linguistic considerations though there are some critiques as for this issue, for instance, Spack (1997) maintains that predicting cultures by means of explaining writing differences prompts a normative stance which leads to grouping students together on the basis of their first language background (Hyland, 2005; Hyland, 2006). This is a useful point, but conducting researches might help us understand the ways individuals write in a second language because in line with Hyland's. (2005) statement, basically the L2 writer is writing from his or her own familiar culture and the L1 reader is reading from another context, and so a possible explanation for

any difficulties of comprehension may be related to the amount of effort that the writer expects the reader to invest in the text.

A. *Limitations of the Study*

Since sample selection process is one of the crucial stages in conducting a study, at the beginning of the study it was decided to adopt the writers' names and their affiliation as the criteria of nativeness. However, these criteria were considered to be unreliable since the same names may be used by different scientists of different nations speaking different mother tongues. Regarding affiliation, academic members of a country are not necessarily natives of countries. Therefore, it is probable that the articles have been written or edited by a native or native-like English speaker. It caused to change the perspective as for nativeness and to present a novel definition in this regard in order to delimit and to maintain reliability of the study, that is, it is not the nativeness, and non-nativeness of the writer(s) of medical RAs which is of paramount importance. However, nativeness, and non-nativeness of the context in which the articles are published are of crucial importance. Further, it could be by-product of repetitive evaluations and revisions of articles by journals' editors. Therefore, the rhetorical style of each article is, at least partly, resulted from employing generic features.

The other notable point is that the issue 'who second language- speaking students are' is a vexed one linguistically, educationally, and politically. According to Paltridge and Starfield(2007), rather than, a dichotomy between first- and second language speakers of English, it may be useful, as Swales suggests, to think of academic English proficiency as a continuum as at one pole is Broadly English Proficient (BEP) scholars and researchers who are either first or second language speakers of English and, if second language speakers, they are particularly bilingual within their disciplinary field, and at the other pole, those scholars who are more Narrowly English Proficient (NEP) since gradually ,many academic members and supervisors from non- English speaking background could make achievement in publishing and communicating in English.

The second limitation of the study was that, some of the medical journals especially non- ISI ones, which were normally required for random selection, could not be available, or some numbers of the journals were not available. Therefore, in some cases, hard copies or available online versions of the articles of these journals were used.

The third limitation is that principally, rhetorical analysis especially metadiscourse analysis is a so much time demanding. Ideally to attain the most reliable and valid results statistically, it requires more repetition of performing the test that virtually providing such a humanity power as researchers and raters is roughly implausible (Crismore & Abdollehzadeh, 2010). Therefore, the restricted numbers of raters were asked to analyze a limited number of articles and repetitions of metadiscourse analysis were carried out on a small sample of the same corpus of the study.

B. *Suggestions*

A few suggestions are made about future research being based on the findings of the present study as follows:

► While this study has embarked upon interactive features of 'method section' within ISI and non- ISI medical RAs, there could be other researches in the future examining introduction, results, and discussion sections of these articles with respect to metadiscourse analysis in order to present a more exhaustive description of Iranian and non- Iranian medical RAs and to improve the level of the learners' proficiency by deciphering the blind spots of the learners' rhetorical patterns.

► Articles written by Iranian authors within ISI and also non-ISI journals can be juxtaposed with those written by native authors to examine their respective linguistic and cultural characteristics as for metadiscourse markers.

► It is recommended that metadiscourse studies on different disciplines within IMRD structure of RAs written by non-native and native speakers of English be conducted in order to draw on the results to improve the level of educational planning in the country.

REFERENCES

- [1] Abdi, R. (2009). Projecting cultural identity through metadiscourse marking: A comparison of Persian and English research articles. *Journal of English Language Teaching and Learning* 52.212, 1-15.
- [2] Crismore, A., & Abdollehzadeh, E. (2010). A review of recent metadiscourse studies: The Iranian context. *Nordic Journal of English Studies* 9.2, 195-219.
- [3] Dudley-Evans, T. (1998). Introduction. In I. Fortanet-Gamez; et al(eds.), *Genre Studies in English for Academic Purposes*. Castello de la Plana. Universitat Jaume I.
- [4] Hinds, J. (1987). Readers vs. Writers' responsibility: A new typology. In U. M. Connor & R. B. Kaplan (eds.), *Writing across Languages: Analysis of L2 Text Reading*. Mass: Addison-Wesley, 141-152.
- [5] Hyland, K. (1998). Boosting, hedging and the negotiation of academic knowledge. *Text* 18.3, 349-382.
- [6] Hyland, K. (2000). *Disciplinary discourses: Social interactions in academic writing*. Harlow: Pearson Education.
- [7] Hyland, K. (2005). *Metadiscourse: Exploring interaction in writing*. London: Continuum.
- [8] Hyland, K. (2006). *English for academic purposes: An advanced resource book*. London: Routledge.
- [9] Hyland, K. (2007). Applying a gloss: Exemplifying and reformulating in academic discourse. *Applied Linguistics* 28. 2, 266-285.
- [10] Hyland, K. (2010). Metadiscourse: Mapping interactions in academic writing. *Nordic Journal of English Studies* 9.2, 125-143.
- [11] Hyland, K., & Tse, P. (2004). Metadiscourse in academic writing: A reappraisal. *Applied Linguistics* 25.2, 156-177.

- [12] Hyon, S. (1996). Genre in three traditions: Implications for ESL. *TESOL Quarterly* 30. 4, 693-722.
- [13] Livnat, Z. (2012). Dialogue, science, and academic writing. Philadelphia: John Benjamins Publishing Company.
- [14] Montgomery, S.L. (1996). The scientific voice. New York: The Guilford Press.
- [15] Mauranen, A. (1993a). Contrastive ESP rhetoric: Metatext in Finnish-English economic texts. *English for Specific Purposes* 12, 3-22.
- [16] Mauranen, A. (1993b). Cultural differences in academic rhetoric. Frankfurt Am Main: Peter Lang.
- [17] Paltridge, B. & Starfield, S. (2007). Thesis and dissertation writing in a second language: A handbook for supervisors. London: Routledge.
- [18] Prelli, L. (1989). A rhetoric of science: Inventing scientific discourse. Columbia: University of South Carolina Press.
- [19] Rahman, M. (2004). Aiding by the reader: The use of metadiscourse devices in scientific discourse. *Nottingham Linguistic Circular* 18, 29-48.
- [20] Shokouhi. (2009). Metadiscourse functions in English and Persian sociology articles: A study in contrastive rhetoric. *Poznan Studies in contemporary Linguistics* 45.4, 535-554.
- [21] Spack, R. (1997). The rhetorical construction of multilingual students. *TESOL Quarterly* 31.4, 765-74.
- [22] Swales, J. M. (1981). Aspects of article introductions. Birmingham, UK: Aston University.
- [23] Swales, J.M. (1990). Genre analysis: English in academic and research settings. Cambridge: Cambridge University Press.
- [24] Swales, J. M. (2004). Research genres: Explorations and application. Cambridge: Cambridge University Press.
- [25] Swales, J.M. (2010). From context to text: Investigating structures, functions, and forms in today's research article. <http://www.lattice.cnrs.fr/> (accessed 12/6/2012).
- [26] Valero-Garcés, C. (1996). Contrastive ESP rhetoric: Metatext in Spanish-English economics texts. *English for Specific Purposes* 15.4, 279-294.
- [27] Vande Kopple, W.J. (2002). Metadiscourse, discourse, and issues in composition and rhetoric. In E. Barton & G. Stygall (eds.), *Discourse studies in composition*. Gresskill, NJ: Hampton Press, 91-114.
- [28] Vázquez, I., Giner, D. (2009). Writing with conviction: The use of boosters in modeling persuasion in academic discourses. *Revista Alicantina de Estudios Ingleses* 22, 219-237.

Fariba Ghadyani completed her studies in molecular medical virology with an M.S. degree from Tarbiat Modarres University in Iran, Tehran. Afterwards, she got her M.A. degree in teaching English as a foreign language (TEFL) from Sheikh-e-Bahae University in Iran, Esfahan. She is a Ph.D. candidate of TEFL in Iran including Sheikh-e-Bahae University now. At present, medical English for specific purposes (ESP) and rhetoric studies comprises her great research interests.

Mohammad Hassan Tahririan is the professor of applied linguistics at Sheikh-e-Bahae University in Iran, Isfahan.