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A comparative genre-based study of research articles' introductions written by English native/non native speakers

Um estudo comparativo de introdução de artigos de pesquisa escritos por falantes nativos e não nativos de inglês, com base em pesquisas sobre gênero textual

ABSTRACT - This study aims to compare the Introduction section of a number of medical research articles written by non-native speakers of English (Iranian) and English native speakers in terms of their rhetorical structures. The articles published in ISI-indexed journals have been investigated using the models presented by Nwogu and Halliday. The models are related to Moves/Sub-moves and grammatical metaphors, respectively. Using statistical tests such as *chi-square tests for goodness of fit and Mann-Whitney U tests,* the authors have found that the Iranians used fewer Moves/Sub-moves and grammatical metaphors compared to native speakers. Awareness of this academic writing practice may contribute to pave the ground for Iranian researchers to publish their articles in world-known journals.

Keywords: genre, writing, research articles, SFL, ESP, ESL, grammatical metaphors.

RESUMO - Este estudo tem como objetivo comparar a seção Introdução de um número de artigos de pesquisa médica escritos por falantes não-nativos de Inglês (que são iranianos) e por falantes nativos de Inglês em termos de suas estruturas retóricas. Os artigos publicados em revistas indexadas ISI foram investigados usando os modelos apresentados por Nwogu e por Halliday. Os modelos estão relacionados a movimentos/sub-movimentos e metáforas gramaticais, respectivamente. Usando testes estatísticos como os testes de qui-quadrado e U Mann-Whitney, os autores descobriram que os iranianos usaram menos movimentos/submovimentos retóricos e metáforas gramaticais em comparação com falantes nativos. Uma conscientização desta prática de escrita acadêmica pode apontar um caminho para que pesquisadores iranianos possam publicar seus artigos em revistas mundialmente conhecidas.

Palavras-chave: gênero, redação, artigos de pesquisa, SFL, ESP, ESL, gramaticais metáforas.

Introduction

Over the past few years, genre-based approaches have become the focal point of interest for many scholars undertaking studies in a number of disciplines including Applied Linguistics, Linguistics, Philosophy and Literature (Hyland, 2007). During the last few decades, the global phenomenon of the rising use of English as a language which has international targets also led to exponential growth in activities related to language teaching as well as materials development in English language (Bruce, 2008). The willingness of graduate and undergraduate students to learn English is for the purpose of taking part in higher education in universities and institutes across the world where English is the medium of instruction (Bruce, 2008). Hence, "preparing learners to cope with the language requirements and, in particular, the writing requirements of university courses" would be major concerns for many teachers (Bruce, 2008, p. 2). To that effect, genre-based approaches can play pivotal roles in encouraging students to learn English and writing required by world-known universities (Cheng *et al.*, 2010). It is noteworthy to say that genre-based approaches used for the teaching of writing can pave the way for graduate and post graduate students who will be or are experts in different disciplines to publish their research findings in

internationally-known journals (Swales, 2004). In other words, awareness of, and competence in, the writing practices of different academic disciplines can pave the ground for researchers to enter different discourse communities and hence they can publish their research articles in books and journals in English (Hyland and Hamp-Lyons, 2002).

According to Hyon (1996), there are mainly three approaches — Systemic Functional Linguistics (SFL), the New Rhetoric, and English for Specific Purposes (ESP) — in genre studies which have been widely used by scholars. Each of these three approaches has its own conceptual framework developed by leading scholars (Hyland, 2007). Before touching upon the frameworks of the approaches introduced in the literature, the researchers think that it is necessary to consider the definition of genre and its importance in academic writing. Referring to ways of using language by members of a society, genre is defined by Hyland (2007) as abstract and socially recognized ways of using language shaped on the basis of similarities members of a community recognize in the texts they use frequently while communicating with each other. Considering the definition of genre, Dudley-Evans and St John (1998, p. 19) state that ESP is fundamentally a "teaching-led movement" closely intertwined with Applied Linguistics and English Language Teaching. A prominent scholar in the ESP movement is Swales (1981, 1986, 1990), whose research studies have played a critical role in shaping genre theory in the movement. For many scholars interested in ESP, both social function and form are supposed to be of high importance (Hyon, 1996). However, a number of studies carried out by ESP researchers imply that formal characteristics of genres are more important than specialized functions of texts including social contexts for a number of researchers (Bhatia, 2004). Structural Move analyses have been deployed by scholars to describe global organizational patterns in different genres such as experimental research articles (Swales, 1990, 2004), Master of Science and Doctor of Philosophy dissertations (Hopkins and Dudley-Evans, 1988; Yang, 2012), medical abstracts (Salager-Meyer, 1990; Anderson and Maclean, 1997) as well as medical research reports (Nwogu, 1991, 1997).

Another approach related to genre studies is the New Rhetoric dubbed in the literature Rhetorical Genre Studies (RGS). Genre analysis in New Rhetoric research is not similar to ESP research. New Rhetoric was first introduced by a circle of scientists called North American scholars. The major concern of those scholars was L1 teaching and a number of courses related to writing, including rhetoric, composition studies, and professional writing, were of great importance for them. In New Rhetoric research, the situational contexts in which genres take place are more important than what was the main focus of research studies in ESP i.e., forms and special emphasis on the social purposes. The actions texts perform within different situations are also important for New Rhetoric researchers (Hyon, 1996).

Defining genre in New Rhetoric research, Miller (1984, p. 151) says "genre must be centered not on the substance or the form of discourse but on the action it is used to accomplish." Since the main concerns in New Rhetoric fields are the functional and contextual aspects of genres, a number of scholars utilize ethnographic methods, including participant observation, interviews, and document collection in an attempt to find thick descriptions of academic and professional contexts which surround genres (Bazerman, 1994; Devitt, 1991).

The final approach in genre-studies is Systemic Functional Linguistics (SFL) put forth by the British-born linguist Michael Alexander Kirkwood Halliday also known as M.A.K. Halliday. The main concern in Systemic Functional Linguistics is the link between language and its functions in different social settings. According to Halliday (1978), the forms of language are figured out by a number of key characteristics which surround social contexts. Halliday (1978) named the features as Field (the activity going on), tenor (the relationships between the people involved in the communicate act) and mode (the channel of communication).

According to SFL perspective, any given semantic configuration is believed to be in a congruent form which refer to "the typical ways of saying things [which are] closer to the state of affairs in the external world" or various incongruent or metaphorical forms described as "not expressed through the most typical (and highly coded) form of representation" (Halliday, 1978, p. 180). Thus, in an attempt to shed some more light on the issue Halliday put forth the concept of grammatical metaphor which is termed as "the expression of a meaning through a lexicogrammatical form […] originally evolved to express a different kind of meaning" (Thompson, 1996, p. 165).

Over the past decade, a number of scholars have paid attention to the issue of grammatical metaphor and its importance in teaching the science of writing. For instance, Christie and Derewianka (2008) carried out a study on the use of grammatical metaphor in school discourse; Colombi (2008) undertook a study to investigate the use of grammatical metaphor in academic language development; Colombi and Schleppegrell (2002) tried to describe advanced literacy in first and second languages by using grammatical metaphor and Farahani and Hadidi (2008) carried out a study in which they studied grammatical metaphor in science and modern prose fiction.

Moreover, a number of scholars working on the ESP approach used Move analysis in their studies to help ESP students, researchers and teachers to cope with their language requirements in an English context (see for example: Amnuai and Wannaruk 2013; Yang and Allison, 2003).

Writing ability of ESP practitioners, including graduate and postgraduate students, has been the main

concern of a number of studies in recent years. Considering the importance of the issue, Bahrami and Riazi (2009) say many scholars in the Islamic Republic of Iran and other world countries majoring in different disciplines, including medical sciences, are eager to publish the outcomes of their studies in prestigious English journals indexed by Thomson Reuters or other indexing systems. In a bid to open the doors of research for students and teachers regarding the mentioned point, Bahrami and Riazi (2009) state that ESP researchers can find rhetorical strengths or weaknesses of medical authors by investigating different sections of medical research articles including the traditional IMRD (i.e., Introduction, Method, Results and Discussion) in contrastive studies.

Surveying the related literature, one can witness some studies carried out to meet the expectations of the ESP community with regard to the writing ability of students in an English context. For instance, Atai and Fallah (2005) contrasted two sections of articles, namely Results and Discussion written by English and Iranian native speakers majoring in applied linguistics with regard to their move frequency, concluding that Results and Discussion sections of these two groups of articles are written differently, since the writing style in Farsi is different from English. Similarly, Mahzari and Maftoon (2007) contrasted the Introduction section of medical research articles written in Persian with those written in English by researchers belonging to English speaking countries. They concluded that in the two languages, the generic organization of the Introduction section of medical research articles is similar with regard to their move frequency; however, the realization of the moves is radically different.

In another study, Zare-ee (2009) investigated the effects of genre-based instruction on qualitative and quantitative aspects of a group of EFL learners' writing performance on a letter-writing task in an Iranian context. Zare-ee (2009) said the results revealed highly significant changes in the quality of writing as a result of genre-based instruction.

Comparing/contrasting the microstructural aspects of the rhetoric of native speakers of English and Persian, a number of researchers have worked on a number of critical issues to help EFL learners as well as ESP students improve their writing ability. For instance, Rezaee and Sayfouri (2009) utilizing SFL and ESP genre analyses compared Moves and Sub-moves in Introduction and Discussion sections of English Research Articles in Iranian and English/American medical journals.

An observational study of linguistic metaphors in "a small pilot corpus of discussion sections of medical research articles" has been conducted by Mungra (2009, p. 6). According to Mungra (2009), the most common metaphor used in the discussion section of the papers was linked to "input domains relating to bodily experience or to a cultural one, such as container, movement, fictive motion and justice".

A corpus-based investigation into the genre of medical case reports (MCRs) has been carried out by Helen (2012) in an attempt to show the evolution of MCRs through the lens of genre theory. In his study, Helen (2012) described the salient textual features with regard to different sections of MCRs in addition to the effect of the Internet on its creation.

Considering the mentioned studies, one can say that there is still paucity of research with regard to weaknesses of non-native speakers of English in writing scientific research papers. Hence, the present study, linked to other comparative studies, aims to bridge an observed gap in the literature by comparing a number of medical research articles written by Iranian and English native speakers in terms of the Moves and Sub-moves used in their Introduction section. Furthermore, the number of grammatical metaphors used in the same section of the articles has been compared. To attain the objectives of the study, two models have been used by the researchers in the two phases of the study dubbed the ESP Move analysis and the Systemic Functional linguistics (SFL) phase. In other words, Nwogu's (1997) model with regard to different Moves and Sub-moves of the Introduction section of medical research articles has been used in the first phase of the study. In the second phase, Halliday's (1998) account of grammatical metaphor in scientific discourse has been utilized for comparing the two groups of the articles dubbed IrISI and EISI.

Following a thorough investigation of different sections of medical research articles, Nwogu (1997) extended Swales' (1981, 1990) genre-analysis model to the whole structure of research papers written by native speakers and figured out a schematic structure of information in the papers. To put it simply, Nwogu (1997) identified eleven Moves and Sub-moves deployed in the Introduction section of those articles, as can be seen in Table 1.

By utilizing SFL for describing distinctive features of scientific discourse in different majors, Halliday and Matthiessen (2004) put forth at least seven features with grammatical metaphor (GM) being the most critical., Halliday (1998) explains that there are three main groups of GMs (i.e., textual GMs, interpersonal GMs and ideational GMs) and he categorized ideational GMs into 17 sections as Table 2 displays them with some examples.

It is noteworthy that all the journals have been indexed by Thomson Reuters Corporation (formerly called the Institute for Scientific Information - ISI). The ISI-indexed journals are said to enjoy high degrees of reliability and credibility due to strict laws imposed by the US-based corporation regarding the review processes of the articles (Testa, 2012). In the following part, the research questions of this study will be presented.

Table 1. Moves and sub-moves of the introduction section of medical research articles (Nwogu 1997, p. 125).

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

Table 2. Halliday's (1998) types of ideational GM in scientific discourse.

	Semantic type Congruent	metaphorical		Class shift	Example
1	Quality	event of process	entity	adjective-noun	usable-usability
2i	Process	event of process	entity	verb-noun	transform-transformation
2ii		aspect of phase of		tense/phase verb (adverb)-noun	going to/try-prospect/attempt
3	Circumstance	[minor process]	entity	proposition-noun	with/accompaniment
4	Relator		entity	conjunction-noun	so-cause, proof; if-condition
5i	Process	event of process	quality	verb-adjective	[poverty] is increasing- increasing poverty
5ii		aspect of phase of process		tense/phase verb (adverb)	begin-initial
6i	Circumstance	manner	quality	adverb-adjective	[acted brilliantly]- brilliant [acting]
6ii		time, place, etc.	quality	propositional phrase-adjective	[argued for a long time]- lengthy [argument]
6iii			class	pre.-phrase- noun pre-modifier	cracks on the surface- surface[cracks]
7	Relator		quality	conjunction-adjective	before-previous
8	Circumstance		process	be/go+ preposi-tion-verb	be about-concern; be instead of-replace
9	Relator		process	conjunction-verb	and-complement; them-follow; so-lead to
10	Relator		circum-stance	conjunction-prepositional	when-in times of; so-as a result
11	0		entity	0-noun	[x] – the fact of [x]
12	0		process	0-verb	[x]-[x] occurs
13	Entity		modifier (of entity)	noun-various	engine[fails]-engine[failure];glass fracture; [the fracture] of glass

Research questions

The current study aims to answer the following research questions with regard to the use of Moves and Sub-Moves as well as the grammatical metaphors in the Introduction section of medical research articles.

(i) Is there any significant difference between English articles written by Iranian and English native speakers in terms of the frequencies of Move/Sub-move used in their Introduction section?

(ii) Is there any significant difference between English articles written by Iranian and English native speakers in terms of the overall frequencies of Moves/Sub-moves used in their Introduction section?

(iii) Is there any significant difference between frequencies of all types of ideational grammatical metaphors in the Introduction section of the research articles written by Iranian and English native speakers?

Based on these questions, the following hypotheses were developed:

(i) There is not a significant difference between English articles written by Iranian and English native speakers in terms of the frequencies of Move/Sub-move used in their Introduction section.

(ii) There is not a significant difference between English articles written by Iranian and English native speakers in terms of the overall frequencies of Moves/Sub-moves used in their Introduction section.

(iii) There is not a significant difference between frequencies of all types of ideational grammatical metaphors in the Introduction section of the research articles written by Iranian and English native speakers.

Method

The present study is a descriptive corpus study in nature. Furthermore, the variables of the current comparative study included Moves and Sub-moves as well as grammatical metaphors used in the selected IrISI and EISI articles.

The corpus

The corpus of this study consists of 20 research articles labeled in some journals as original articles which were written by Iranians and 20 articles written by English native speakers – considering the fact that all of ISI-cited articles have the standard structure of IMRD (i.e., Introduction, Method, Results and Discussion). It is noteworthy to say that the randomly-selected articles have

been published between 2011 and 2013 in a number of medical journals which are shown in Table 3. The articles have been authored by Iranian native speakers, including all bilingual and monolingual speakers of the Farsi language which is the standard language in Iran, and English native speakers coming from the US, the UK, Canada, Australia and New Zealand.

Procedures and data analysis

As mentioned previously, this study has been done in two phases i.e., in relation to English for Specific Purposes (ESP) and Systemic Functional Linguistics (SFL). First, by deploying Nwogu's (1997) model in the ESP phase, the introduction section of the articles were compared in terms of the Moves/Sub-moves. In the second phase of the study, regarding the SFL analysis, Halliday's (1998) complex model related to grammatical metaphors was used for comparing the Introduction section of the articles. To put it clearly, in the SFL phase, by adopting Halliday's (1998) model of types of grammatical metaphors (GM) in scientific discourse, the ideational GM types used in the EISI articles in the Moves and Sub-moves of the Introduction section – Move 1. (Presenting Background Information) and Sub-moves 1.1 (Reference to established knowledge of the field), 1.2 (Reference to main research problems), Move 2. (Reviewing related literature) and Sub-moves 2.1 (Reference to limitations of previous research), 2.2 (Reference to previous research), Move 3. (Presenting new research) and Sub-moves 3.1 (Reference to research purpose) and 3.2 (Reference to main research procedure) -- were compared with the same GM types used in the IrISI articles. In the ESP Move analysis phase of the study chi-square tests for goodness of fit were used and in the SFL phase Mann-Whitney U tests were utilized for answering the research questions.

Results

The first phase of the study dubbed the ESP Move analysis was related to individual and overall frequencies of Moves and Sub-moves in the Introduction section of the selected research articles which were mentioned in question number one and two of the study. The third research question related to the grammatical metaphors was answered in the second phase of the study, SFL.

Analysis of chi-square was run to answer the first research question of the study comparing the IrISI and EISI articles in terms of the frequencies of Moves used in their Introduction section.

Based on the results displayed in Table 4 and Figure 1 there were not any significant differences between the number of Moves in the Introduction section of the articles; first Move (χ^2 (1) = 0, p > .05), second Move (χ^2 (1) = .026, p > .05) and third Move (χ^2 (1) = .026, p > .05).

Table 3. The selected journals of the present study (i.e., Iranian ISI – IrISI and English ISI - EISI).

Iranian ISI Journals (IrISI)	Archives of Iranian Medicine Iranian Red Crescent Medical Journal Iranian Journal of Public Health Journal of Research in Medical Sciences Archives of Razi Institute Iranian Journal of Basic Medical Sciences Avicenna Journal of Medical Biotechnology
English ISI Journals (EISI)	Emergency Medicine Australasia Annals of Internal Medicine The New England Journal of Medicine Journal of Hospital Medicine International Journal of Clinical and Experimental Medicine Academic Emergency Medicine British Journal of Hospital Medicine Teaching and Learning in Medicine: An International Journal Alternative Medicine Review American Journal of Emergency Medicine Annals of Emergency Medicine American Journal of Preventive Medicine Journal of Royal Society of Medicine The American Journal of Medicine

Thus, it can be concluded that the first null-hypothesis was not rejected as there was not any significant difference between English articles written by Iranian and English native speakers in terms of the frequencies of Moves used in their Introduction section.

Moreover, analysis of chi-square was run to compare the English articles written by Iranian and English native speakers in terms of the frequencies of Sub-moves used in their Introduction section. Based on the results displayed in Table 5 and Figure 2 it can be concluded that there were not any significant differences between the number of Sub-moves in the Introduction section of the articles; first Sub-move (χ^2 (1) = .44, p > .05), second Sub-move (χ^2 (1) = .44, p > .05), third Sub-move (χ^2 (1) = .714, p > .05), fourth Sub-move (χ^2 (1) = 1.12, p > .05) and fifth Sub-move (χ^2 (1) = .714, p > .05). However there was a significant difference between the number of the sixth Sub-move in the Introduction section (χ^2 (1) = 5.76, p < .05). The English native speakers made more use of the last Sub-move (English = 16 vs. Iranian = 5) in the Introduction section of their articles.

To answer the second research question comparing the two groups of the articles in terms of the overall frequencies of Moves and Sub-moves used in their Introduction section, the researchers ran analysis of chi-square. Based on the results seen in Table 6 and Figure 3 it can be concluded that there was a significant difference between the number of Moves and Sub-moves in the Introduction section of the articles; (χ^2 (1) = 4.37, p < .05). The English native speakers made more use of the Moves and Sub-move (English = 175 vs. Iranian = 138) in the Introduction section of their articles. Thus the second null-hypothesis was rejected.

A Mann-Whitney U test was also run to compare the frequencies of all types of ideational grammatical metaphors in the Introduction section of the research articles written by Iranian and English native speakers. The frequencies of all types of ideational grammatical metaphors deployed in the Introduction section of the articles written by Iranians and English native speakers are shown in Tables 7 and 8 respectively. Based on the results represented in Table 9 and Figure 4 it can be concluded that there was a significant difference between the frequencies of all types of ideational grammatical metaphors in the Introduction section of the research articles authored by Iranian and English native speakers (Mann-Whitney U = 97.50, Z = -2.77, p < .05). Thus the third null-hypothesis was rejected.

Based on the results displayed in Table 10 and Figure 4 it can be concluded that the English writers made more use of ideational grammatical metaphors in the Introduction section of their articles than Iranian scholars (English Mean Rank of = 25.63 vs. Iranian Mean Rank = 15.38).

A number of Moves and Sub-moves identified on the basis of Nwogu's (1997) model in the Introduction

Table 4. Results of Chi-square tests for goodness of fit for the moves used by IrISI and EISI.

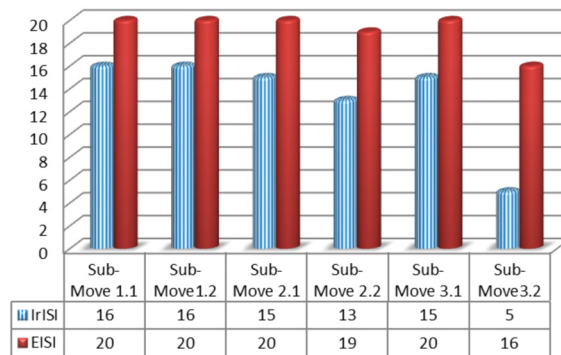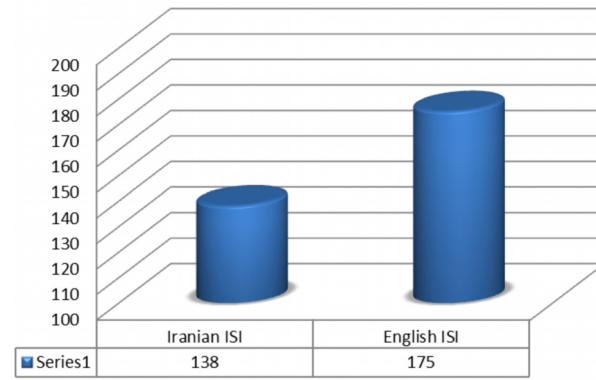| Moves	Moves, introduction section		
	Move 1	Move 2	Move 3
Iranian ISI	*20*	*19*	*19*
English ISI	*20*	*20*	*20*
X²	*0.000*	*0.026*	*0.026*
Asymp. Sig.	*1*	*0.873*	*0.873*
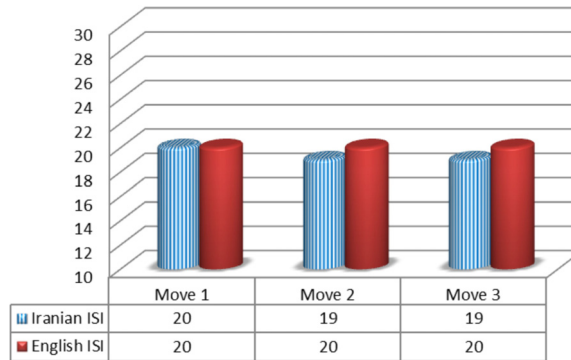
Figure 1. Frequencies of moves used by IrISI and EISI (Introduction Section).

Table 5. Results of Chi-square tests for goodness of fit for the sub-moves of the introduction section used by IrISI and EISI.

Sub-Moves	1.1	1.2	2.1	2.2	3.1	3.2
IrISI	16	16	15	13	15	5
EISI	20	20	20	19	20	16
X2	.444	.444	.714	1.125	.714	5.762
Asymp. Sig.	.505	.505	.398	.289	.398	.016

Figure 2. Frequencies of sub-moves used by IrISI and EISI (Introduction Section).

Table 6. Results of Chi-square tests for goodness of fit for the moves/sub-moves used by IrISI and EISI.

	Moves and sub-moves, introduction section
Iranian ISI	*138*
English ISI	*175*
X2	4.374
Asymp. Sig.	.036

Figure 3. Overall frequencies of moves/sub-moves used by IrISI and EISI (Introduction section).

Table 7. Frequencies of each type of GM as used by IrISI (Iranian ISI) articles in the introduction section of the selected texts.

No	Article	Text length	1	2i	2ii	3	4	5i	5ii	6i	6ii	6iii	7	8	9	10	11	12	13	Total frequency
1	One	178	3	3	-	-	-	2	-	-	2	-	-	-	1	2	-	1	3	17
2	Two	121	3	4	-	-	-	-	-	1	-	2	-	-	-	-	-	1	1	12
3	Three	172	6	5	-	-	-	1	-	2	-	-	-	-	1	2	-	1	3	21
4	Four	283	6	10	5	-	-	-	1	3	3	-	-	1	-	-	2	7	7	45
5	Five	208	-	3	-	-	-	-	-	1	-	-	-	2	-		1	3		10
6	Six	190	2	3	-	-	-	-	-	1	1	-	-	-	-	-	-	1	1	9
7	Seven	230	3	16	1	-	-	1	-	1	4	6	-	-	-	-	2	2	7	43
8	Eight	363	2	14	1	1	-	4	-	4	1	10	-	1	-	-	1	4	15	58
9	Nine	212	2	8	-	-	-	1	-	2	1	-	-	-	-	-	2	2	2	3	23
10	Ten	363	-	10	-	-	-	4	-	2	3	5	-	-	1	3	2	1	10	41
11	Eleven	467	3	7	1	-	-	4	-	2	6	2	-	-	-	2	-	3	6	36
12	Twelve	615	4	15	-	-	-	2	2	5	-	2	-	2	-	-	2	5	13	52
13	Thirteen	291	4	4	-	-	-	-	-	2	-	-	-	-	2	2	-	1	3	18
14	Fourteen	287	2	3	-	-	-	-	1	1	-	-	-	-	-	-	-	1	2	10
15	Fifteen	389	1	10	-	1	-	-	2	3	4	3	-	-	-	2	2	2	9	39
16	Sixteen	386	1	15	-	-	-	-	-	9	2	2	-	1	-	5	1	2	15	53
17	Seventeen	489	5	10	-	-	-	-	-	3	3	3	-	1	-	2	-	5	10	42
18	Eighteen	378	1	15	-	1	-	1	-	2	1	-	-	-	-	-	-	4	11	36
19	Nineteen	331	-	10	-	-	-	-	-	4	4	4	-	-	1	-	1	2	8	34
20	Twenty	438	6	15	-	-	-	1	1	5	-	-	-	-	-	1	-	4	10	43

Table 8. Frequencies of each type of GM as used by EISI (English ISI) articles in the introduction section of the selected texts.

No	Article	Text length	1	2i	2ii	3	4	5i	5ii	6i	6ii	6iii	7	8	9	10	11	12	13	Total frequency
1	One	357	5	12	-	-	-	2	2	2	-	3	2	2	-	2	-	2	5	39
2	Two	379	2	15	3	1	2	-	2	2	-	5	-	1	-	1	-	4	14	52
3	Three	526	3	40	1	1	-	2	3	4	2	5	-	1	3	-	-	10	19	94
4	Four	240	4	14	2	1	-	2	-	5	1	4	-	2	-	2	1	6	7	51
5	Five	613	14	31	1	-	1	2	-	3	-	3	-	2	-	4	-	10	18	89
6	Six	391	2	14	-	-	-	3	1	7	2	2	-	-	-	2	-	6	8	47
7	Seven	256	1	12	-	1	-	1	-	-	-	-	1	2	-	4	1	6	9	38
8	Eight	414	7	14	1	2	-	1	4	1	-	2	-	-	-	4	1	7	12	56
9	Nine	110	-	5	-	-	-	-	-	3	-	-	-	-	-	-	-	3	3	14
10	Ten	200	-	10	1	-	-	-	-	-	2	2	-	-	-	-	2	3	7	27
11	Eleven	374	4	10	1	-	1	4	2	5	-	1	1	1	-	1	-	9	5	45
12	Twelve	257	2	12	-	-	-	-	-	5	3	-	-	-	-	-	-	3	4	29
13	Thirteen	728	14	24	-	1	2	1	2	5	2	2	-	-	1	2	2	6	16	80
14	Fourteen	539	7	26	1	2	-	2	-	10	1	3	-	-	2	1	1	7	18	81
15	Fifteen	271	1	13	-	-	-	1	1	3	-	2	-	-	-	-	-	3	13	37
16	Sixteen	346	5	14	2	-	-	3	-	9	3	3	-	2	1	1	3	4	11	61
17	Seventeen	347	3	18	1	-	-	2	6	1	2	-	-	-	-	-	1	5	16	55
18	Eighteen	426	4	12	2	1	1	7	1	4	1	-	-	-	-	1	-	6	11	51
19	Nineteen	254	4	12	-	1	-	1	-	3	1	2	-	2	-	-	1	2	6	35
20	Twenty	378	5	14	-	-	-	5	-	4	-	-	-	-	2	1	-	2	14	47

Table 9. Results of Mann-Whitney U test for the frequency of ideational GM used by IrISI and EISI.

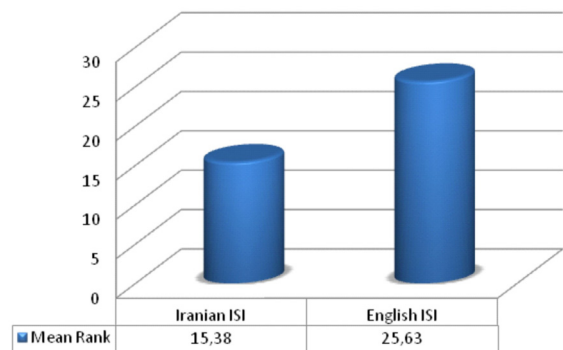|	Introduction
Mann-Whitney U	97.500
Wilcoxon W	307.500
Z	-2.774
Asymp. Sig. (2-tailed)	.006
Exact Sig. [2*(1-tailed Sig.)]	.005

Figure 4. Mean ranks of ideational GM used by IrISI and EISI (Introduction section).

Table 10. Mean ranks for the frequency of ideational GM used by IrISI and EISI.

	Group	N	Mean Rank	Sum of Ranks
	Iranian ISI	20	15.38	307.50
Introduction	**English ISI**	20	25.63	512.50
	Total	40		

section of the IrISI and EISI journals will be presented in the following part. Moreover, using Halliday (1998)'s model different types of ideational grammatical metaphors which have been found by the researchers in the Moves and Sub-moves will be presented.

- Pressure (2i) ulcers, also known as bedsores (13), are skin (13) or (13) tissue injuries (2i) over bony (6ii) prominences caused (9) by pressure (2i)… *(Sub-move 1.1 in EISI).*
- To improve patient (13) quality of life and to decrease healthcare (13) costs in the management (2i) of SCD (13) there has been increased (5i) focus on predicting (2i) high (6i) utilization (2i) and identifying (2i) strategies to decrease hospitalization (2i) rates, especially among patients with EHHU *(Sub-move 1.1 in EISI).*
- Studying (2i) preparedness (2i) in the ED setting (2i) is particularly important because many U.S. EDs currently operate at or near capacity and could benefit (8) from tools and plans to capably generate surge (13) capacity. *(Sub-move 1.2. in EISI)*
- Considering (2i) the importance of facial (6iii) involvement (2i) as a severity (1) factor in treatment (2i), we conducted this study (12) to evaluate the differences (2i) between clinical (6iii) features and severity (1) of psoriasis according to (10) the facial (6iii) involvement (2i) in Iranian (6ii) psoriatic patients *(Sub-move 3.1 in IrISI).*
- Several groups studied large cohorts of sporadic breast (13) cancer (13) patients and age (6iii) matched (5i) controls for nonsense or frame-shift (13) mutations (2i) within the *ATM* (13) gene *(Sub-move 2.1 in IrISI).*
- Vitamin C is an important antioxidant in human; however, several studies showed vitamin C (13) level in diabetic patients is decreased *(Sub-move 2.1 in IrISI).*

Discussion and conclusion

As seen in Tables 4 and 5, the results of the comparisons made between the IrISI and EISI articles showed that the Iranian scholars majoring in medicine used nearly an equal number of Moves and Sub-moves while they were counted individually in the Introduction section of IrISI articles compared to the analysis of the same part of EISI articles written by English native speakers. Scientifically speaking, the lack of a meaningful difference between the frequencies of Moves and Sub-moves except for the Sub-move 3.2 in the Introduction section of the IrISI and EISI articles have confirmed that both Iranian and English native speakers have been successful in the application of the main types of information (Moves) while analyzing each individual Move and Sub-move. The results can also be connected to the fact that all of the 40 articles were published by international and domestic ISI-indexed journals in medical sciences.

Moreover, Table 6 showed that while counting the overall frequencies of Moves and Sub-moves in the Introduction section of the IrISI and EISI articles, the Iranians used fewer numbers of Moves and Sub-moves. It means that Iranians should pay much more attention to the overall view of the Introduction section of their articles and use adequate number of Moves and Sub-moves so that the readers may receive enough information. The results of this part of the study are in line with that of Mahzari and Maftoon (2007) who state that the generic organization of the Introduction section of original medical papers in English and Persian are the same with regard to their individual Move frequency while they are not the same in terms of the overall frequencies of Moves and Sub-moves.

Following the above mentioned tables and the role of Moves and Sub-moves in writing a well-structured manuscript for a publication submission, Kallestinova (2011, p. 184) states that: "Moves are traffic signs that lead the reader through the road of your ideas. Each move plays an important role in your paper and should be presented with deep thought and care". So, the results of this section imply that Iranian medical experts have not been able to fully present their information with regard to their research studies which could hence distract and confuse the readers.

It should be noted that the difference observed between the selected articles related to the reference to main research procedure, Sub-move 3.2, in the Introduction section indicates that pointing to main research procedure, Sub-move 3.2, is the missing circle in the Introduction section of IrISI articles.

The difference seen between the two groups of the IrISI and EISI in terms of the use of the ideational grammatical metaphors in Table 10 proposes that Iranians used less complex types of scientific discourse when writing their papers. This issue may occur because of the deployment of non-native English writers or editors in Iranian ISI-indexed journals. The results of this section of the study are in line with what Tabrizi and Nabifar (2013) and Sayfouri (2010) found in their studies while comparing the use of grammatical metaphors in articles written by Iranians and English native speakers.

Similarly, the results found in this study support the findings of some other studies (e.g., Mohammadi Khahan, 2006; Faghih and Rahimpour 2009) that highlighted the inability of Iranian experts in writing well-organized research articles. Moreover, this study backs Li and Ge (2009)'s viewpoint regarding the importance of Moves in the process of writing a good research paper.

In conclusion, the present genre-driven study highlights key rhetorical problems of Iranians belonging to medical community while writing articles for ISI-indexed journals. Furthermore, Iranian experts and editors in charge of editing Iranian medical journals should consider the results of this study which showed that authors published their articles in IrISI journals used fewer Moves and grammatical metaphors and hence fewer native-like structures.

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