



**University of Tehran**

**Faculty of Foreign Languages and Literatures**

**SFL and ESP Genre Analysis of English Research Articles**

**in Iranian and English-American Medical Journals:**

**A Contrastive Study**

**by**

**Nasrin Sayfour**

**Supervisor**

**Abbas Ali Rezaee, PhD**

**A dissertation submitted to the Graduate Studies Office in partial fulfillment of the  
requirements for the degree of Doctor of Philosophy in Teaching  
English as a Foreign Language**

**September 2010**



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**University of Tehran**  
**Faculty of Foreign Languages and Literatures**  
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We, the committee members, hereby recommend that this dissertation entitled “SFL and ESP Genre Analysis of English Research Articles In Iranian and English-American Medical Journals: A Contrastive Study” by Nasrin Sayfoury be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Teaching English as a Foreign Language.

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September 2010

*To my parents,*

*my husband,*

*my son, and my daughter-in-law*

## ABSTRACT

Literature in the area of contrastive genre analysis shows that Iranian medical research articles (RAs) in English have not been scrutinized to detect the possible peculiarities of their rhetorical features. On the other hand, the probable rhetorical differences between the articles published in internationally-recognized journals and those published in other journals have not been studied regarding either the informational units/Moves used or the types of the ideational grammatical metaphor (GM) employed. Being related to the problems of Iranian medical professionals in writing the Introduction and the Discussion sections of medical RAs in English, the present study was carried out in two phases. In the ESP Move analysis phase, the above-mentioned two sections of three groups of 32 randomly selected articles from ISI English-American (E-A), ISI Iranian, and non-ISI Iranian medical journals were compared in terms of the organization of Moves/Sub-moves used based on Nwogu's (1997) model. In the Systemic Functional Linguistics (SFL) phase, through adopting Halliday's (1998) model of types of grammatical metaphor (GM) in scientific discourse, the ideational GM types employed by the ISI E-A articles in three Sub-moves of the Discussion sections were compared with the same GM types used by ISI Iranian ones in the same sections. The analytic results of Move analysis phase revealed that the two groups of Iranian articles employed significantly fewer number of Sub-moves 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 E-A articles. In the SFL genre analysis phase, although Iranian articles were shown to use significantly fewer proportions of ideational GM in general as well as the incongruent forms of qualities compared to E-A ones, the two groups employed the GM types with a similar pattern of

ranking order as well as similar proportions of nominalization. Other results emerging synthetically during text analysis revealed that lack of metadiscourse markers and problems of paragraph development in a considerable number of Iranian articles could impair intelligibility during Move analysis. These findings as well as others presented in the study can be exploited for providing medical professionals with consciousness-raising educational activities regarding RA writing as well as evaluating medical RAs. Some recommendations have also been suggested which can facilitate and objectify the general process of journal/article evaluation.

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## **List of Abbreviations**

**EAP:** English for Academic Purposes

**ESP:** English for Specific Purposes

**SFL:** Systemic Functional Linguistics

**ISI:** Institute for Scientific Information

**GM:** Grammatical Metaphor

**IrISI:** Iranian ISI (Journals)

**IrNISI:** Iranian non-ISI (Journals)

**E-A:** English-American ISI (Journals)

**CR:** Contrastive Rhetoric

**AIM :** Archives of Iranian Medicine

**JRMS:** Journal of Research in Medical Sciences

**IRCMJ:** Iranian Red Crescent Medical Journal

**IJPH:** Iranian Journal of Public Health

**IJMS:** Iranian Journal of Medical Sciences

**MJIRI:** Medical Journal of Islamic Republic of Iran

**SEMJ:** Shiraz E-Medical Journal

**AMI:** Acta Medica Iranica

**BMJ:** The British Medical Journal

**NEJM:** The New England Journal of Medicine

**JCI:** The Journal of Clinical Investigation

**JAMA:** The Journal of American Medical Association

# **Chapter One: Introduction**

## **1.1. Overview**

The importance of genre knowledge in helping language learners to understand and master academic, professional or educational discourse has been widely acknowledged for over two decades (Swales, 2004). Genre is a class of communicative event in which language plays a primary role. Genre analysis explores discourse features in the broad context of the communicative event and attempts to provide the rationale of the discourse features in terms of authors' intentions and institutional conventions (Swales, 1991).

Hyon (1996) identifies three main traditions in contemporary genre studies, which can be seen as complementary, rather than competing approaches: English for Specific Purposes (ESP) genre analysis, New Rhetoric studies, and a distinctive Australian approach that draws extensively on Systemic Functional Linguistics (SFL). According to Hyon (1996), many ESP scholars have paid particular attention to detailing the formal characteristics of genres while focusing less on the specialized functions of texts and their surrounding social contexts. The second approach, New Rhetoric research describes a body of North American scholarship from a variety of disciplines concerned with the teaching of mother tongue (L1), including rhetoric, composition studies, and professional writing. These genre scholars, unlike ESP ones, have focused more on the situational contexts in which genres occur than on their forms and have placed special emphases on the social purposes or actions that these genres fulfill within these situations.

ESP and Australian genre scholars have shown more tendency than the New Rhetoric Studies to teaching different genres explicitly and have thus been more interested in construction of models and materials for teaching genres (Hyon, 1996). To

pursue this goal, ESP/EAP (English for Academic Purposes) scholars have tried to describe texts of different disciplines through analyzing the Moves or types of information presented in each text. Swales (2004) defines Move in genre analysis as “a discoursal or rhetorical unit that performs a coherent communicative function in a written or spoken discourse” (Swales, 2004, p. 29). According to Skelton (1994), Moves are consistent conventional patterns not learned by the users but are parts of their unconscious knowledge which can be recognized by means of Move structure analysis. A plethora of Move analysis studies have been conducted to describe the types of information used in different genres of various disciplines.

In the medical field, until the publication of Nwogu's article in 1997, studies of features of written medical discourse had mostly tended to focus on the syntactic features of texts (e.g. Pettinari, 1982, on the functions of grammatical alternation in fourteen surgical reports; Salager, 1986, on the classificatory framework and rhetorical function of the specialist medical English lexis).

Only a few studies, however, have attempted to investigate the organization of information in scientific research reports (e.g. Adams Smith, 1984, on the subjective elements of the authors' comments; Salager-Meyer, 1994, on the frequency and category distribution of hedges). The first investigation analyzing the Moves of the four sections of the articles has been attributed to Skelton who described “the structure of original research papers published in the *British Journal of General Practice* to help researchers and trainers to write and teach writing medical research articles (RAs) more successfully” (Skelton, 1994, p. 455).

Nwogu (1997) analyzed the Moves deployed in different sections of medical research papers. Having extended Swales' (1981, 1990) genre-analysis model to the whole structure of the medical research paper, Nwogu (1997) provided a schematic

structure of information in this type of paper. He finally identified eleven moves, out of which 8 were found to be ‘normally required’ and three ‘optional’. Li and Ge (2009) analyzed the frequency of occurrence of the 11 moves identified by Nwogu (1997) as a part of their study and showed that time had affected the structural and linguistic features of medical RAs.

Although the theories of the third approach, i.e. Australian genre analysis, have developed during roughly the same period as those of ESP and New Rhetoric studies, they have evolved mainly independently. Australian approaches to genre, although different in some aspects, have all been centered within SFL being a large theory of language developed by Michael Halliday in 1961. According to Systemic Functional Grammar, functional bases of grammatical phenomena are divided into three broad areas, called metafunctions: the *ideational*, the *interpersonal*, and the *textual*. These metafunctions are closely related to different forms of language (registers) which are said to be shaped by key features of the surrounding social context, defined as *field* (the activity going on), *tenor* (the relationship between participants) and *mode* (the channel of communication) (Halliday and Martin, 1993; Martin, 1992, Martin & Rose, 2007). These three elements together determine the *register* of a language.

To describe the distinctive features of scientific discourse from SFL perspective, Halliday (2004) suggested seven features the most significant of which is grammatical metaphor (GM). To elaborate on GM, Martin and Rose (2007) firstly defined lexical metaphor as involving transference of meaning in which a lexical item that normally means one thing comes to mean another. GMs, according to Martin & Rose (2007), “involve transference of meaning from one kind of element to another kind” (p. 110). This transference occurs when *congruent* structures typifying spoken discourse are used *incongruently (metaphorically)* such as those used in English scientific discourse. GM,

according to Halliday (1998), “is a realignment between a pair of strata: a remapping of the semantics on to the lexicogrammar; hence the term ‘reconstruction’ being used here to refer to it” (Halliday, 1998, p.192). He exemplifies his idea, mentioned above, in the two versions of the same experience; the clause *the driver drove the bus too rapidly down the hill* (the more spoken version) can change into the nominal group *the driver’s overrapid downhill driving of the bus* (the more scientific version).

To date, various studies have been conducted to clarify the nature of the phenomenon of GM in different genres (Sànez, 2000; Steiner, 2002-2003; Sušinskiensė, 2004; Banks, 2005; Colombi, 2008; and Farahani & Hadidi, 2008). In the Iranian context, Sanaati’s (2008) study on the description of conceptology in word formation in the Persian language, among other results, revealed that SFL could explain the reason of the presence of far more number of nouns compared to adjectives and verbs in Persian scientific discourse through the process of nominalization/GM formation.

Genre analysis, proving to be an appealing area of research, has long been employed by contrastive rhetoric (CR) and World Englishes (WE) research areas. The two yet-undefined constructs of *innovation* and *intelligibility* posed by Kachru (1997) regarding the performances of non-native speakers of English of the Outer and Expanding Circles have been studied by the researchers conducting CR studies. Such studies can explain if it would be possible to categorize the rhetorical generic difference(s) between the performances of non-native speakers of English in their written texts and the equivalent generic type produced by the writers of the Inner Circle, as *innovation* or mere *divergence*.

To date, numerous contrastive genre analysis studies have inspected the differences between the rhetoric of Persian speakers and that of English ones with

respect to a variety of features in different disciplines. Of the notable examples of contrastive genre-based studies having worked on the macro-structures of the articles written by English and Persian speakers, Atai and Falah (2004) have contrasted the Results and the Discussion sections of articles on applied linguistics written by English and Persian native speakers. The Introduction sections of Medical RAs in Persian, on the other hand, have been contrasted with the English ones written by native speakers of English by Mahzari and Maftoon (2007).

Regarding genre-based studies comparing/contrasting the microstructural aspects of the rhetoric of the native speakers of English and Persian, hedging has been viewed by Falahati (1994) in English and Persian academic discourses. Concerning both medical and applied linguistic RAs, the Results and the Discussion sections of these articles written by English and Persian native speakers have been contrasted by Mohammadi Khahan (2006) based on types and frequencies of hedges and boosters used therein. Interactive and interactional types of metadiscourse markers have been examined in the Discussion sections of the articles on applied linguistics by Faghih and Rahimpour (2009) based on analyzing the articles written by native speakers of English, Iranian articles in English, and Iranian articles in Persian.

The present study, aiming at discovering possible linguistic and cultural similarities and/or differences between the rhetorical styles employed in the articles published in Iranian and E-A medical journals, attempted to compare the macro-structures/informational units (Moves/Sub-moves) of the Introduction and the Discussion sections of three groups of articles selected from ISI Iranian, ISI E-A and non-ISI Iranian medical journals based on ESP genre analysis. Furthermore, following theories of SFL genre analysis, different types of ideational GM used in three Sub-moves of the Discussion sections of two groups of the articles, namely ISI Iranian and



E-A ones, were identified and then compared. The findings are expected to help yield solutions for the problems Iranian scholars, in general, and those involved in medicine, in particular, have expressed when dealing with writing RAs in English (Bahrami and Riazi, 2009). It was also possible to categorize the differences observed in the generic rhetorical styles of the articles published in Iranian medical journals with those of E-A ones as innovation or divergence according to the views presented by Kachru (1997).

## **1.2. Statement of the Problem**

The English language, which evolved as a lingua franca in the late 19<sup>th</sup> and the early 20<sup>th</sup> centuries, “is now the dominant or official language of over 60 countries” (Alcaraz Ariza & Navarro, 2006, p.752). It is also the dominant voice in almost all linguistic varieties of world communications through the Internet and the major foreign language in some countries including Iran.

The spread of the English language, as the major means of world communication, has resulted in paying particular attention to writing in scientific English. Much credit is given to the RAs worldwide – especially those published in universally-recognized journals – as the type of discourse producing first-hand scientific ideas. There is, however, the global issue of the capability of non-native speakers of English or, according to Kachru (1997), those involved in the production of knowledge belonging to the Outer and the Expanding Circles. CR studies, nowadays, are being conducted to compare/contrast the rhetorical peculiarities of native writers of English with those of writers of different other nations. The purposes of these studies (such as those of Hinkel, 1999, Vayà, 2008, and Liming, 2009) are to pinpoint the underlying problems and the differences/similarities between the types of English used by native and non-native users of English.

The above-mentioned problem is also felt in the Iranian medical context. Medical authorities in Iran, like those in charge of other academic disciplines, do not like to lag behind the worldwide competition of contributing to the development of medical knowledge. They, therefore, attempt to measure the scientific productivity of their scholars and university professors by the number of articles they publish in prestigious international and national journals both in English and Persian, with ISI journals having the highest priority. Thus, some of the Iranian scholars, like their international counterparts, even “decide early which journal they will target for their manuscript” (Swales, 2004, p.14). Moreover, Bahrami and Riazi’s (2009) study showed that Iranian medical professionals have a positive attitude towards publishing papers in English.

This enthusiasm is, however, at odds with the various problems observed in medical contexts in Iran, including the small number of current internationally-registered Iranian medical journals and the considerable number of Iranian articles in English which are rejected by internationally reputable journals, possibly due to their rhetorical deviations. “Every year only less than 7% of Iranian scientific publications find their way to international citations” (Mirsharifi, Aminian, & Jafarian, 2008, p 7).

Iranian medical scholars, are, therefore, required to have adequate proficiency in scientific English in general and its medical discourse in particular to be able to read/write RAs, to receive the latest updates in medicine, as well as to publish in English. However, as supported by the findings of Bahrami and Riazi’s study (2009), writing the Introduction and the Discussion sections of RAs, compared with the Methods and the Results sections, call for more innovations, creativity, and subjectivity on the part of the writers. These sections, therefore, tend to reveal the rhetorical strengths or weaknesses more than the other two sections.

The above-mentioned problem which has directly been dealt with in the present study is, likewise, related to the global concern of standardization of the rhetorical styles of non-native writers of English. This study is, thus, tied to the other CR studies worldwide through attempting to cover the existing gap in detecting the merits/demerits of some macro-structural and micro-structural rhetorical aspects employed in Iranian medical RAs. Scrutinizing the micro-structure of the ideational GM types in the second phase of the present study, on the other hand, seems to be another gap in the related literature not having been dealt with even by native English-speaking writers yet.

### **1.3. Purpose of the Study**

Being related to the problems of Iranian medical scholars in writing RAs in English as well as investigating the factors affecting the *intelligibility* of their rhetorical styles, this study attempted to discover the rhetorical strengths/weaknesses of Iranian medical RAs in English by means of comparing the discursive features of these articles with those of ISI English/American (E-A) ones. To achieve this goal, three groups of RAs published in three types of medical journals in English, namely, Iranian ISI, Iranian non-ISI, and ISI E-A medical journals – Types A, B, and C, respectively (Table 3.1) – were randomly selected and analyzed comparatively in two phases. In each phase, the investigations towards describing the rhetorical features of the selected articles have been carried out both *analytically* – by means of pursuing the pre-determined research questions – and *synthetically* through being attentive to extract unpredictable knowledge out of the selected texts.

### **1.3.1. The Two Phases of the Study**

The first phase of the study, taking the macro-structures (Move/Sub-moves) of the Introduction and the Discussion sections of randomly-selected three groups of articles (each comprising 32 articles) into account, probed the types of information used therein by means of ESP Move analysis using Nwogu's (1997) model. In the second phase, in which SFL genre analysis was employed, three Sub-moves of the Discussion sections, namely Sub-moves 10.1 (Stating a specific outcome), 10.2 (Interpreting the outcome), and 10.4 (Contrasting present and previous outcomes) of Iranian and E-A ISI medical RAs, were scrutinized to detect the similarities/differences between their employments of the two types of ideational GM, i.e. experiential and logical. In this phase, Halliday's (1998) table of types of GM in scientific discourse (Table 2.5) was used as the model.

### **1.4. Significance of the Study**

The current study is of significance since in spite of the problem expressed by Iranian medical scholars in writing the Introduction and the Discussion sections of medical RAs (Bahrami & Riazi, 2009), to date, no contrastive ESP Move analysis study of any kind has been carried out on the rhetorical features of these two sections of Iranian medical RAs in English as compared with those of the E-A ones. This study is also one of the first of its kind contributing to the description of the discourse of medical RAs in English with respect to the analysis of the GM types used.

This study is also of pivotal importance in the literature of genre analysis since as far as the researcher has investigated, no study has compared/contrasted the macro- and microstructures of the articles published in ISI and non-ISI journals so as to find out the merits (if any) commonly ascribed to all the articles published in the former or the probable demerits (if any) of those published in the latter. If the value obtained by

English/American or Iranian reputable international journals in English is partly due to the quality of the content and the rhetorical styles of their articles, it could, therefore, be advantageous if the virtues of the articles of these journals, particularly those of the rhetorical styles of the Introduction and the Discussion sections, be found out and, accordingly, provide Iranian medical professionals with consciousness-raising educational activities.

The significance of this study could be more justified by underlining the importance and feasibility of the application of the two linguistic approaches of ESP and SFL genre analysis. The study could show that these two apparently different, but underneath complementary, approaches to genre analysis could be more utilized together to fill in other gaps in the history of genre analysis.

The innovations carried out in the current study developed through applying both quantitative (analytic) and qualitative (synthetic) research methods as well as employing triangulation in statistical analyses can also be regarded as significant.

The rationale behind choosing these types of journals was that the articles published in Types A and C journals had gained the approval of Thomson Reuters. According to the claims made by Garfield (ISI Database), regarding the attention they make when registering the journals, the degree of proficiency of English language, the rhetorical style, the knowledge of the field, and, the overall level of comprehensibility, and, thus, the quality and the quantity of move employment in these articles are expected to be based on standard scientific English used by the discourse community. It was, therefore, logical to expect that the hierarchy of the prestige of the journals be the same as the hierarchy of the quality of the rhetoric of the sample articles of those journals. By the same token, it was expected that articles from Type A and Type C journals, i.e. the two ISI ones, employed the informational units (Moves/Sub-moves) in

a more sophisticated and skillful manner per se compared with those from Type B journals. On the other hand, articles from the two groups of ISI Iranian and E-A journals were supposed to have employed ideational GM types with comparable and intelligible capabilities. The probable differences among the rhetorical performances of the three groups of the articles could account for the linguistic or cultural discrepancies or both.

### **1.5. Research Questions and Hypotheses**

The research questions and the null hypotheses of the analytic approach of each phase of this study have been presented below. However, as the results of the synthetic approach cannot be expected in advance and they will emerge during text analysis procedures, only one research question has been suggested for the synthetic type of either ESP Move analysis or SFL analysis of the sample articles.

#### **1.5.1. Research Questions**

##### **1.5.1.1. The Analytic Approach to ESP Move Analysis**

Of the following research questions, 1 to 3 are associated with the differences of the Move/Sub-move analysis between IrISI (Iranian ISI articles selected from Type A journals) and IrNISI (Iranian non-ISI articles selected from Type B journals), whereas questions 4 to 6 are related to the same differences among the three groups of the selected articles, i.e. IrISI, IrNISI, and E-A articles (ISI English/American articles selected from Type C journals).

1. Is there any significant difference between IrISI and IrNISI articles regarding *the frequency of each individual Move/Sub-move* used in their Introduction and the Discussion sections?

2. Is there any significant difference between IrISI and IrNISI articles regarding *the overall frequency of the Moves/Sub-moves* used in each of the two sections of the Introduction and the Discussion?
3. Is there any linear relationship between IrISI and IrNISI articles regarding *the overall frequency of the Moves/Sub-moves* used in each of the two sections of the Introduction and the Discussion?
4. Is there any significant difference among the three Groups of the articles regarding *the frequency of each individual Move/Sub-move* used in the Introduction and the Discussion sections?
5. Is there any significant difference among the three Groups of the articles regarding *the overall frequency of Moves/Sub-moves* used in each of the two sections of the Introduction and the Discussion?
6. Is there any linear relationship among the three Groups of the articles regarding *the overall frequency of the Moves/Sub-moves* used in each of the two sections of the Introduction and the Discussion?

#### **1.5.1.2. The Synthetic Approach to ESP Genre/Move Analysis**

7. What are the differences between/among the rhetorical features of the three groups of the articles which can emerge during Move/Sub-move analysis of the sample articles?

### **1.5.1.3. The Analytic Approach to SFL Analysis**

The following research questions examine the differences between Iranian ISI articles (IrISI) and E-A ones (E-A) with respect to their uses of the experiential and the logical GMs in Sub-moves 10.1, 10.2, and 10.4.

8. Is there any significant difference between total proportions of all types of ideational GM in the selected texts as used by IrISI and E-A articles?
9. Are there significant differences between the proportions of each type of GM in the selected texts as used by IrISI and E-A articles?

### **1.5.1.4. The Synthetic Approach to SFL Analysis**

10. What are other differences between IrISI and E-A articles which can emerge during GM analysis of the sample articles?

## **1.5.2. Null Hypotheses**

### **1.5.2.1. Analytic ESP Analysis of the Articles:**

1. There is no significant difference between the frequency of *each individual Move/Sub-move* used in the *Introduction* and *Discussion* sections of IrISI and IrNISI articles.
2. There is no significant difference between *the overall frequencies of* each set of *Move/Sub-move* used in the *Introduction* and *Discussion* sections of IrISI and IrNISI articles.
3. There is no significant correlation between the overall frequency of the Moves as well as the Sub-moves used in each of the two sections of the Introduction and the Discussion sections of IrISI and IrNISI articles.



4. There are no significant differences among the three Groups of the articles regarding *the frequencies of each individual Move/Sub-move* used in the *Introduction* and the *Discussion* sections.
5. There are no significant differences among the three Groups of the articles regarding *the overall frequencies of each set of Move/Sub-move* used in the *Introduction* and *Discussion* sections.
6. There are no significant correlations among the overall frequencies of the Moves as well as the Sub-moves used in each of the two sections of the Introduction and the Discussion sections of IrISI, IrNISI, and E-A articles.

#### **1.5.2.2. Analytic SFL Analysis of the Articles**

7. There is no significant difference between total proportions of all types of ideational GM used by IrISI and E-A articles in the selected texts.
8. There are no significant differences between the proportions of each type of GM used by IrISI and E-A articles in the selected texts.

Due to the unpredictability of the related results, null hypotheses cannot be given for the *synthetic* questions of the two phases.

## 1.8. Definition of Key Terms

**ISI English/American journals:** These medical journals are published in England and the USA and have been registered by the Institute for Scientific Information (recently, Thompson Reuters).

**Iranian ISI medical journals:** These Iranian medical journals in English have also been registered by the Institute for Scientific Information. The list of these journals can be accessed at the website of [http://www.sid.ir/en/isi\\_iran.asp](http://www.sid.ir/en/isi_iran.asp) under the title of *Iranian journals indexed in international website of ISI*. In order to observe consistency among the contents of all the articles of this study, care has been taken to choose only those journals from this list which do not belong to any particular specialty.

**Iranian non-ISI medical journals:** In the present study, these journals are Iranian medical journals in English which do not belong to the list of Iranian ISI medical journals mentioned above. They can, however, be found in the general list of *IRAN MEDEX-Indexing Articles Published in Iran Biomedical Journals* at the website of <http://iranmedex.net/english/list.asp> . These journals are mostly registered by other international indexing systems such as, Scopus, Index Medicus, Pub Med, Medline, etc. These journals are not related to any specific type of specialty.

**Macrostructures:** In this study, macrostructures are the Moves and the Sub-moves used in medical RAs as the major units of presenting information. This use of the term is similar to what Richards, Platt, and Platt (1992) consider synonymous to genre-scheme, discourse structure, or rhetorical structure.

**Microstructures:** They are the articles' choices of the linguistic resources by means of which the macrostructures (Moves and the Sub-moves) are presented. The

microstructures under scrutiny in this study consist of 17 types of GM analyzed in the second phase of this study.

**Move:** Although *Move* has been defined almost similarly by different scholars. In the present study, Move/Sub-move identification procedure has been carried out through following Ding's (2007) and Nwogu's (1997) definitions of Move which is "the functional unit in a text, being related to the overall task, which is used to identify the textual regularities in certain genres of writing" (Ding, 2007, p. 369-370). According to him, Moves vary in length ranging from several paragraphs to at least one proposition.

**Sub-Move:** This is the same term used by Nwogu (1997) referring to the constituent elements of Moves. Sub-moves are different realizations of Moves.

### 1.7. Limitations and Delimitations

It was initially decided to categorize the articles in terms of the writers being either native speakers of English or Persian. However, during sample selection processes, it was discovered that medical RAs, especially those published in E-A ISI journals, are usually written by several authors, possibly, with various nationalities. This fact made it virtually impractical to determine which one(s) of these authors was (were) actually native speaker(s) of English or which one(s) had contributed more to the creation of the articles. Although in some Iranian contrastive rhetorical studies, such as Abdi's (2009-2010) study, *nativeness* has been judged by the name and/or affiliation of the authors, in the present study, this method was considered to be unreliable since different nations speaking different mother tongues may use the same names usually common in English-speaking countries.

Affiliation cannot likewise be an authentic way of identifying a native speaker of a particular language since members of academia in a university or other centers of higher

education located in a country are not always natives of that country. By the same token, Iranian *nativeness* of the writers of medical RAs published in national/international journals may be mistrusted since there is always the probability of the article being totally written or, at least edited, by a native or a native-like English speaker. The findings of the contrastive rhetoric studies following such article selection criteria can, therefore, be questionable.

To avoid arriving at such doubtful results, and consequently unreal interpretations, a delimitation of the present study is the way the rhetorical styles employed in the articles were viewed. The rhetorical features employed in the articles were regarded as the by-products of different probable real stages of productions, evaluations, and revisions. It was not, therefore, the nativeness/non-nativeness of the writer(s) of the medical RA which mattered but the nativeness/non-nativeness of the context in which the related journal was published. Throughout the study, care has been taken to consider the rhetorical style of each article responsible for the generic features employed rather than the writer of the article.

Since all the journals, which were normally required for random selection, could not be available, a limitation of this study is that the samples were selected from among the articles of the journals which were either accessible in hard copy or were available online.

To determine the intra-rater and inter-rater reliability of Move identification procedure, it was necessary to compare the Moves/Sub-moves identified by the researcher with two other raters. As this process is per se a very time-consuming one and, on the other hand, it necessitated spending a considerable amount of time for training the raters to do the task, another limitation of the study was that the raters were asked to analyze the Moves/Sub-moves of only three articles.

The macro-structures and the micro-structures of a medical RA can comprise different components or features. The macro-structures and the micro-structures probed in this study were delimited to those taken by the two models of the study.

### **Organization of the Dissertation**

The following chapter, Chapter Two, includes the theoretical background underlying the two phases of ESP and SFL genre analysis outlooks together with the other related theories and approaches as well as introducing the relevant studies. Chapter Three accounts for the methodology applied, the models employed, the procedures taken, and the data analyses performed to carry out the analytic and the synthetic approaches of each of the two phases of the study. Chapter Four reporting the results of the data analysis procedures is followed by Chapter five which discusses the findings and offers the implications of the study as well as suggestions for further research.

## **Chapter Two:**

### **Review of the Related Literature**

## **2.1. Introduction**

The present study has attempted to compare/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 as well as SFL ideational GM analysis of two groups of Iranian and English/American ISI medical RAs. The first section of this chapter, i.e. Theoretical Background, tries to depict the historical legacy of the concepts and theories underlying the pillars of the present study with an emphasis on the pedagogical aspects. The second section, the Related Studies, deals with the influential genre analysis studies done by Iranian and non-Iranian researchers, carried out in different disciplines of EAP in general and in medicine in particular.

There has been an intentionally additional elaboration on two types of studies which constitute the focal points of the hypotheses of the present study. The first focus of attention has been on English-Persian contrastive genre analysis studies with the purpose of discovering the amount and types of the cultural peculiarities of the rhetoric of Iranian writers having been unveiled in the literature. This can ultimately help illuminate the point of departure of the present study, and simultaneously, its contribution to the growing literature of CR and World Englishes with respect to cultural differences between the rhetorical style of native/native-like writers of medical RAs in English and that of Iranian ones.

The second spot of concentration on the related studies in this section has been on the worldwide genre analysis studies carried out on medical discourse in order to find out the status of the present study in the universal development of knowledge in the field of discourse analysis of English medical RAs especially with regard to its

contribution to ESP Move analysis as well as GM analysis of scientific English in general and medical texts in particular.

## **2.2. Theoretical background**

This section intends to illuminate the major influential ideas and theories in the course of history in those areas of human endeavor which are related to the production of the present study. These areas include views on genre and genre analysis, the modern shape of the research article, the emergence and the relationship between contrastive rhetoric and world Englishes, as well as the current views on the criteria of journal/article evaluation. It has been attempted to focus on the theories and ideas which are more pedagogically oriented as the main implication of this study is supposed to provide hints and indications for teaching how to write academic English. Although the techniques evolved in two trends of ESP and SFL genre studies have been employed in this study, other trends including Literary as well as North American Rhetorical studies have also been accounted for due to the strong multidirectional impacts all these traditions have exerted upon each other.

### **2.2.1. The Development of Genre Theory**

Being the most significant means of communication among human beings through which various intentions can be transferred, speech has shown to be so complicated to scrutinize that one of its manifestations, being ‘genre’, has undergone striking developmental processes to be defined through centuries due to having multiple facets.

*Genre* has widely been used as a classifying notion throughout its history particularly in the fields of arts, literature and media. Attitudes towards genre



understanding have been shaped by the epistemologies of various traditions. The word *genre* (Webster's New World Dictionary, 1986) comes from the French word for 'kind' or 'class' through the Latin *genus* which is related to the Indio-European base *gen-* meaning 'to produce' or 'to generate', and Greek *genos* meaning 'to be born'. The complexity seen in the meaning of the word as suggested by Bawarishi and Reiff (2010, p. 4) has evidently been observed in the variety of views expressed by different traditions, from genre being mainly a tool of maintaining the 'class' or 'type' of texts to acting dynamically 'to generate' a variety of discursive social actions. Since the modern conceptions of genre and rhetoric – especially the concepts underlying the New Rhetoric approach to genre studies discussed later in this section – have greatly been influenced by Greek and Roman philosophy, some of the most relevant ideas and concepts of classical philosophy are explained briefly here.

#### **2.2.1.1. Genre and Rhetoric: Classical Views**

There is controversy among scholars whether modern genre theory dates back to Aristotle with regard to his perception of reality. Breure (2001) points out that according to Aristotle:

The entire visual world was constituted by *substance* and *form*. Form was the cognoscible element that specified the individual and which could be abstracted from the objects in a process of perception. External objects impinged upon the senses, and due to the power of reason the mind was able to extract the essence (or form), which determined the nature of the observed thing. (Part I)

In this reasoning, as explained by Beure (2001), it was not individuals but *species* that had essences. A species is defined by giving its *genus* and its *differences*: the genus is

the kind under which the species falls, and the differences tell what characterizes the species within that genus. For example, ‘human’ might be defined as animal (the genus), having the capacity to reason (the difference). For Aristotle, the universe was a strictly ordered hierarchy, so classification was inherent in this classical legacy (Beure, 2001). Although Aristotle, and other Greek philosophers, had been concerned with the questions about ultimate reality and the process of human cognition, scholars like Campbell and Jamieson (1978) and Miller (1984), believing that the ideas presented by Aristotle can be regarded as the basis of genre theory, employ the same terms to refer to genre facets.

The English word ‘rhetoric’, having been derived from Greek *rhētorikē*, now means “the art or science of using words effectively in speaking or writing” (Webster’s New World Dictionary, 1986). According to Kennedy (as cited in Nordquist, 1994),

*rhētorikē* specifically denoted the civic art of public speaking as it developed in deliberative assemblies, law courts, and other formal occasions under constitutional government in the Greek cities .... it is a cultural subset of a more general concept of the power of words and their potential to affect a situation in which they are used or received. (p. 1)

Aristotelian definition of ‘rhetoric’ has extremely influenced modern understanding of the term through its emphasis on *persuasion*. Aristotle defines ‘rhetoric’ as “the faculty of observing in any given case the available means of persuasion” (Honeycutt, 2000, Chapter 2). Those modes of persuasion which are related to the rhetorician are: (1) the speaker’s power of evincing a personal character which will make his speech credible (*ethos*) (2) his power of stirring the emotions of his hearers (*pathos*); and (3) his power of proving a truth, or apparent truth, by means of persuasive arguments (*logos*) (Honeycutt, 2000, Chapter 2).

Aristotle's inspiring view of persuasion in rhetoric led to the emergence of another impressive term, the *rhetorical situation* enriched more fully by Bitzer (1968). According to him, rhetorical situation can be considered as a natural context of persons, events, objects, relations, and an exigence which strongly invites utterance (Bitzer, 1968, p. 5). He defines the three constituents of any rhetorical situation as:

...[1] *exigence* is an imperfection marked by urgency, it is a defect, and obstacle, something waiting to be done .... An exigence is rhetorical when it is capable of positive modification and when positive modification requires discourse or can be assisted by discourse. [2] ... rhetorical *audience* [which] consists only of those persons who are capable of being influenced by discourse and of being mediators of change. [and, 3] ... a set of *constraints*. There are two main classes of constraints: (1) those originated or managed by the rhetor and his method (Aristotle calls these "artistic proofs"), and those other constraints in the situation, which may be operative (Aristotle's "inartistic proofs") (pp. 6-8).

#### **2.2.1.2. Genre: Bakhtinian Perspective**

Bakhtin, the Russian great philosopher and linguist of the 20<sup>th</sup> century states that "the nature and forms of the use of language are as diverse as the areas of human activity" (Bakhtin, 1986, P.60). His view of *genre* is revealed through his belief that individual utterances realize language and participate in the various areas of human activity and "reflect the specific conditions and goals of each such area not only through their content and linguistic style, i.e. the selection of the lexical, phraseological, and grammatical resources of the language, but above all through their compositional

structure” (p.60). The term *speech genre*, as used by Bakhtin (1986), is defined by him as follows:

...thematic content, style, and compositional structure are linked to the *whole* of the utterance and are determined by the nature of the particular sphere of communication. Each separate utterance is individual, of course, but each sphere in which language is used develops its own *relatively stable types* of these utterances. These we may call *speech genres*. (p.60)

The ‘thematic content’ and ‘compositional structure’ of a genre can be equated to Halliday’s *field* and *mode*, respectively. Bakhtin’s ‘style’, on the other hand can, in part, be an equivalent to Halliday’s *tenor* when he sheds more light on what he means by ‘style’:

Style is inseparably linked to particular thematic unities and – what is especially important – to particular compositional unities: to particular types of construction of the whole, types of its completion, and types of relations between the speaker and other participants in speech communication (listeners or readers, partners, the other’s speech, and so forth). (Bakhtin, 1986, p.64)

In the aforementioned definition of genre, Bakhtin (1986) regarded the types of utterances to be *relatively stable* due to the respective cause-effect link between the historical changes and changes in speech genres. In his view, utterances and speech genres are the drive belts from the history of society to the history of language. Bakhtin (1986) even considered the genre types as the primary path through which any change in the system of language occurs, arguing that “there is not a single new phenomenon

(phonetic, lexical, or grammatical) that can enter the system of language without having traversed the long and complicated path of generic-stylistic testing and modification (Bakhtin, 1986, p. 65).

According to Bakhtin (1986) speech genres are extremely heterogeneous. However, they have been studied only in the disciplines of rhetoric and literature and only in terms of the specific artistic features that distinguish one from the other, not as specific types of utterances distinct from other types.

Perhaps the most significant part of Bakhtin's (1986) ideas is the difference he considers between *primary* (simple) and *secondary* (complex) speech genres, the former being everyday language, and the latter, novels, dramas, all kinds of scientific research, and so forth which arise in more complex and comparatively highly developed ideological and organized cultural communication. He argues that:

During the process of their formation, secondary genres absorb and digest various primary simple genres that have taken form in unmediated speech communication. These primary genres are altered and assume a special character when they enter into complex ones. They lose their immediate relation to actual reality and to the real utterances of others....(p.62)

In order to find the difference between primary and secondary (ideological) genres, Bakhtin (1986, p.62) suggests that the nature of the utterance should be revealed and defined through analysis of both types. To Bakhtin (1986), it is the job of almost all areas of linguistics and philology to *Study the nature of the utterances* as well as the diversity of generic forms of utterances in various spheres of human activity.

To ignore the nature of the utterance or to fail to consider the peculiarities of generic sub-categories of speech in any area of linguistic study leads to perfunctoriness and excessive abstractness, distorts the historicity of the

research, and weakness the link between language and life. After all, language enters life through concrete utterances ... and life enters language through concrete utterances as well. (p.63)

Bakhtin relates genre to functional styles and believes that language, or functional styles are, in essence, nothing other than generic styles. “A particular function (scientific, technical, commentarial, business, everyday) and the particular condition of speech communication specific for each sphere give rise to particular genres” (Bakhtin, 1986, p.64).

#### **2.2.1.3. Genre in Literature**

Among the traditions of genre approaches, literary approaches have been the least directly concerned with pedagogical instructions. However, history shows the impact, although reciprocal, of literary generic evolution on other traditions of genre approaches as stated by Devitt (2000) that “the fields of literature, linguistics, and rhetoric-composition share more in common with one another than they do with other disciplines” (p.696). Literary genre traditions have been significant to scholarship in linguistic and rhetorical studies of genre by means of the analytical perspectives they offer, including those about genre and creativity and the ways that they have informed widespread beliefs about genre. The impacts of different literary approaches to genre – including Neoclassical, Structural, Reader Response, and Cultural Studies – on rhetorical, linguistic, and pedagogical approaches to genre are discussed here.

Neoclassical approaches to genre follow a theoretical, trans-historical, deductive, apriori set of categories or taxonomies used to define and clarify kinds of literary text according to internal thematic and formal relations. Genette (as cited in Bawarishi & Reiff, 2010) argues that the whole history of the theory of genre is impressed by the

famous literary triad of lyric, epic, and dramatic which are actually more the product of Romantic and post-Romantic poetics. The impact of the organizational attitudes of Neoclassical taxonomies on writing instruction, although prevents teachers and students from viewing genres as dynamic, situated actions, “have helped to authorize the creation of de-contextualized taxonomies which have resulted in the use of modes of writing such as the still widely-taught ‘description’, ‘narration’, ‘persuasion’, and ‘exposition’” (Bawarishi & Reiff, 2010, p. 15).

Contrary to the Neo-classical abstract approaches, the Structuralist (literary-historical) inductive approaches to genre regard genres as “essentially literary institutions, or social contracts between a writer and a specific public whose function is to specify the proper use of a particular cultural artifact” (Jameson, as cited in Bawarishi & Reiff, 2010, p. 18). According to this view, genres shape and structure our perceptions of literary actions. For instance, knowing that the paragraph appears in a novel with the title *Murder at Marplethorpe*, helps the reader to discover that the novel belongs to the genre of detective fiction.

As Breure (2001) asserts, the European Romantic movement of the 18<sup>th</sup> and the 19<sup>th</sup> centuries, while acknowledging Darwin’s theory of evolution, questioned the division of literary works into static genres believing that the historical character of genre alter and evolve across time. “Every poem is a genre unto itself is a famous statement by Schegel” (p.3). The implications of such resistance to genre for writing instructions, have been the debate established in the classroom over constraint and choice, convention and creativity where “students’ authentic voices and visions are perceived to be in tension [and interconnected] with the constraining forces of genre conventions” (Bawarishi & Reiff, 2010, p.22).

Cultural Studies approaches, the final approaches to genre in literature examined here, offer a larger dimension for genre as can be figured out in Todorov's attitude towards genre:

Like any other institution, genres bring to light the constitutive features of the society to which they belong ... [as such] a society chooses and codifies the [speech] acts that correspond most closely to its ideology; that is why the existence of certain genres in one society, and their absence in another, are revelatory of that ideology". (Todorov, as cited in Bawarishi & Reiff, 2010, p.24)

#### **2.2.1.4. Genre in Linguistics: ESP Approach**

It should be specified here that since the ultimate concentration of the present study has been on the language of medicine as an 'academic' discourse, in this chapter, it has been attempted to embark, initially, on the ideas and studies relevant to the EAP branch of English for Specific Purposes and, therefore, studies of other branches of ESP, such as English for Occupational Purposes (EOP), have not been specifically taken into account. Nevertheless, wherever need has arisen, the term ESP has been employed implying that the idea(s) of that particular occasion is (are) shared by all branches of ESP in general and EAP in particular.

Dudley-Evans and St John (1998) attributed *register analysis* as the first trend in ESP – the other trends being Rhetorical and Discourse Analysis, Analysis of Study Skills and Analysis of Learning Needs – to the works done by, firstly, Barber (1962) and then, Ewer and Hughes-Davies (1971-1972). These works, referred to by Swales (1998, p.1) as an approach based on 'lexicostatistics', were related to the early sixties where syllabuses were essentially structural. This type of register analysis was actually



frequency analysis. However, according to Jordan (1997), register analysis in ESP was, perhaps, originated by Michael West in 1936 with his count of the frequency of the occurrence of the meanings and uses of words in a study of five million running words. The results presented a list of 2000 of the most common words ‘considered suitable as the basis of vocabulary for learning English as a foreign language’ (Jordan, 1997, p.228). It included a supplementary word list for the writing of ‘popular science and technology’. Jordan (1997) states that perhaps the best-known ESP book of the sixties was Ewer and Latorre (1969) which was based on a register analysis of scientific texts.

#### **2.2.1.4.1. Genre and Register in ESP**

*Genre analysis*, the fruitful area of research in ESP, started in its contemporary shape in eighties and flourished by one of the most influential figure of the trend, John Swales. While investigating for a comprehensive definition of *genre* from the viewpoints of the scholars of four sections, i.e. folklore, literary studies, linguistics, and rhetoric, Swales (1991) finally came to the following common components among them:

1. a *distrust* of classification and of facile or premature prescriptivism;
2. a *sense* that genres are important for integrating past and present;
3. a *recognition* that genres are situated within discourse communities, wherein the beliefs and naming practices of members have relevance;
4. an *emphasis* on communicative purpose and social action;
5. an *interest* in generic structure (and its rational);
6. an *understanding* of the double generative capacity of genres - to establish rhetorical goals and to further their accomplishment.

The definition Swales (1991) attempts to provide, based on the common components mentioned above, is as follows:

A genre comprises a class of communicative events the member of which share some set of communicative purposes. These purposes are recognized by the expert members of the parent discourse community, and thereby constitute the rationale for the genre. This rationale shapes the schematic structure of the discourse and influences and constrains choice of content and style. Communicative purpose is both a privileged criterion and one that operates to keep the scope of a genre as here conceived narrowly focused on comparable rhetorical action. In addition to purpose, exemplars of a genre exhibit various patterns of similarity in terms of structure, style, content and intended audience. If all high probability expectations are realized, the exemplar will be viewed as prototypical by the parent discourse community. (p. 58)

Although Swales' (1991) definition of genre has not dealt with the social aspects of genre, his more recent view shows more consolidation with the views of other traditions as he argues that:

My current attempt [is] to see genres no longer as single – and perhaps separable – communicative resources, but as forming complex network of various kinds in which switching modes from speech to writing (and vice versa) can – and often does – play a natural and significant part. (Swales, 2009, pp. 4-5)

The introduction which Dudley-Evans (as cited in Jordan, 1997) offers for genre analysis can shed more light on the stance the ESP scholars have adopted in their view of genre:

It has characteristic features of style and form that are recognized, either overtly or covertly, by those who use the genre. Thus, for example, the research article has a known public purpose, and has conventions about layout, form and style that are to a large degree standardized. (p.231)

With the advent of computer-based corpora and the development of the ideas of genre analysis, Register Analysis (the analysis of grammatical features of specific texts) came back in a prominent position *corpus linguistics* in which it is possible to relate the quantitative data that emerge from computer analysis especially from the use of concordancing programs to discorsal features of text (Dudley-Evans and St John, 1998). According to Dudley-Evans and St John (1998), this new form of register analysis renders much more meaningful findings.

It is worth mentioning that ESP approach has made the actual distinction and/or overlapping between *discourse analysis* and *genre analysis*. The approach, as explained by Dudley Evans and St John (1998, p.87), regards genre analysis a sub-category of discourse analysis as the latter is a global/umbrella term for any type of text analysis. Wherever the focus of the text analysis is on the distinguishing regularities of structure of a particular text, this is genre analysis.

#### **2.2.1.4.2. Definition of Move in ESP Approach**

Swales and his followers, in their attempts to analyze the discourses of different communities, have been seeking the *Moves* employed in them. Swales (2004) defines Move in genre analysis as “a discorsal or rhetorical unit that performs a coherent

communicative function in a written or spoken discourse” (Swales, 2004, p.29). According to Swales (2004), “a Move, at one extreme, can be realized by a clause; at the other by several sentences. It is a functional not a formal unit” (p. 20). Utilizing Swales’ (1990) ideas and those of Connor et al (1995), Ding’s definition of Move in EAP writing genres can be interpreted as ‘a functional unit in a text, being related to the overall task, which is used to identify the textual regularities in certain genres of writing’(Ding, 2007, pp.369-370). According to him, Moves vary in length ranging from several paragraphs to at least one proposition. Nwogu (1997), on the other hand, defines Move as “a text segment made up of a bundle of linguistic features (lexical meaning, propositional meanings, illocutionary forces, etc.) which give the segment a uniform orientation and signal the content of discourse in it” (p. 122). To relate Moves to their Sub-moves, Nwogu (1997) argues that Moves are conventional schema, consisting of hierarchically ordered knowledge structures and Sub-moves are their constituent elements. According to Skelton (1994), Moves are consistent conventional patterns not learned by the users but are parts of their unconscious knowledge which can be recognized by means of Move structure analysis.

#### **2.2.1.5. Genre in Linguistics: Sydney School Approach**

Australian genre theories have developed mainly independently of ESP and New Rhetoric studies. The approaches of Australian scholars to genre, although different in some aspects, have all been centered within Systemic Functional Linguistics (SFL) being a large theory of language developed by Michael Halliday who founded the University of Sydney’s linguistics department in 1975 and has since greatly influenced language theory and education in Australia.

#### 2.2.1.5.1. Metafunctions in SFL

As understanding all the concepts employed in SFL, including genre and register, necessitates having a background on the metafunctions launched by Halliday in 1960s, a brief introduction to the three metafunctions is presented here.

According to Systemic Functional Grammar, functional bases of grammatical phenomena are divided into three broad areas, called metafunctions: the *ideational*, the *interpersonal*, and the *textual*. To choose the term ‘metafunction’ instead of simply ‘function’, Halliday and Matthiessen (2004) point out that:

...‘function’ simply means purpose or way of using language, and has no significance for the analysis of language itself. But the systemic analysis shows that functionality is **intrinsic** to language: that is to say, the entire architecture of language is arranged along functional lines. Language is as it is because of the functions in which it has evolved in the human species. The term ‘metafunction’ was adopted to suggest that function was an integral component within the overall theory. (p.31)

They (Halliday and Matthiessen, 2004) suggest two basic functions of language in relation to our ecological and social environment: 1. making sense of our experience, and, 2. acting out our social relationships. They call the first one the *ideational* metafunction believing that language *construes* human experience. It names things, thus construing them into categories, and then into taxonomies, often using more names for doing so. These elements are even configured into complex grammatical patterns. The ideational metafunction deals with the process, some doing or happening, saying or sensing, being or having with its various participants and circumstances. This metafunction is distinguished into two components, the *experiential* and the *logical*. The second function of language mentioned above, deals with *interpersonal* metafunction,

stating that the clause of the grammar is also a proposition, or a proposal, whereby we inform or question, give an order or make an offer, and express our appraisal of and attitude towards whoever we are addressing and what we are talking about. Halliday and Matthiessen (2004) consider this metafunction as describing ‘language as action’.

Apart from the two basic functions of language, according to Halliday and Matthiessen (2004), language has another mode of meaning, the third metafunction called *textual*. It relates to the construction of text, and therefore, enables or facilitates the production of the other two metafunctions through building up sequences of discourse, organizing the discursive flow and creating cohesion and continuity. The distinctions between these three metafunctions in SFL have been made only in order to facilitate bringing each of them into scrutiny. “As social discourse unfolds, these three functions are interwoven with each other, so that we can achieve all three social functions simultaneously” (Martin & Rose, 2007, p.7).

#### **2.2.1.5.2. Genre and Register in SFL**

“Although register rather than genre has been Halliday’s central construct for analyzing language, some of his Australian students, most notably Jim Martin, have developed theories of genre within a systemic functional framework” (Hyon, 1996, p. 697). In SFL, genre and register are regarded as mutually inclusive in studying the function of language; these two terms are, therefore, defined together here.

As SFL genre analysis of scientific discourse constitutes half of the present study, here, it is required to have a glance at the way(s) the term ‘genre’ in general, and the ‘genre of science’, in particular, have been discussed by different scholars in SFL, and particularly, by Martin (1992). Martin and Rose (2008) define genre as different types of texts that enact various types of social contexts. For them “*a genre is a staged, goal-*

*oriented social process*, social because we participate in genres with other people; goal-oriented because we use genres to get things done; staged because it usually takes us a few steps to reach our goals” (Martin and Rose, 2007, p.7). They argue that within each of the general types of genres of contemporary western culture, whose patterns of meaning are more or less predictable – such as greetings cards, service encounters, casual conversations, arguments, telephone enquiries, instructions, lectures, etc. –, many more specific genres could also be named. According to Martin and Rose (2008), although the stages of a genre are relatively stable components of the organization of different instances of the genre – such as the Orientation, Incident and Interpretation stages of an exemplum –, the phases within each stage are much more variable.

Eggins, another prominent member of systemic functional linguistics defines *genre* simply as: “When we describe the staged, structured way in which people go about achieving goals using language we are describing genre” (Eggins, 2004, p.10). She gives the example of storytelling which involves the linguistic steps of setting the scene (time, place, participants); developing the action; relating the dramatic event; giving the happy ending; expressing a judgment on the outcome; and wrapping the story up.

To convince the reader of the necessity of having genres in language, Eggins (2004) mentions the significance of habitualization in our lives underlining that we quickly routinize the way we perform repeated activities because it saves us time and energy. On the subject of language genres, Bakhtin (as cited in Eggins, 2004) claims that genres are not only ‘economic’ but they are essential:

If speech genres did not exist and we had not mastered them, if we had to originate them during the speech process and construct each utterance at will for the first time, speech communication would be almost impossible.... We learn to cast our speech in generic forms and, when hearing others’ speech,

we guess its genre from the very first words; we predict a certain length ... and a certain compositional structure; we foresee the end; from the very beginning we have a sense of the speech whole (p.57).

Martin and Rose (2007, p.8), regarding the way we habitualize the speech genres, argue that during our childhood, as we interact with others in various situations, we learn to recognize the relatively consistent patterns of meaning in typical genres of our culture. Then, we learn to predict how each situation is likely to unfold, and how to interact in it.

The other construct introduced in SFL to design context is *register* which is generally organized by *field*, *tenor*, and *mode* (Halliday & Martin, 1993; Martin, 1992, and Martin & Rose, 2007) which are defined by Halliday and Hasan (1985) as follows:

**Field** refers to what is happening, to the nature of the social action that is taking place: what it is that the participants are engaged in, in which language figures as some essential component. **Tenor** refers to who is taking part, to the nature of the participants, their statuses and roles: what kinds of role relationship obtain, including permanent and temporary relationships of one kind or another, both the types of speech roles they are taking on in the dialogue and the whole cluster of socially significant relationships in which they are involved. **Mode** refers to what part language is playing, what it is that the participants are expecting language to do for them in the situation: the symbolic organization of the text, the status that it has, and its function in the context. (p.12)

Martin (1992), trying to resolve the tension which existed among the different views in SFL regarding the relationship of field, tenor, and mode with genre and register, developed his own powerful theory of 'language and its semiotic environment'



(Figure 2.1) which most of the other SFL scholars have accepted and followed. In the interpretation of context of the previously-accepted SFL's stratification, Martin (1992) has added three more communication planes. Two of them included, firstly, register, i.e. *context of situation*, and secondly, genre, i.e. *context of culture*, with register functioning as the expression form of genre, and language functions as the expression form of register. Register itself can be organized according to field, tenor and mode, manifesting metafunctional diversity. As differences among various social groups are manifested in their discourse types, Martin (1992) has added the third communicative plane, i.e. 'ideology', with genre, register, and language as its expression form.

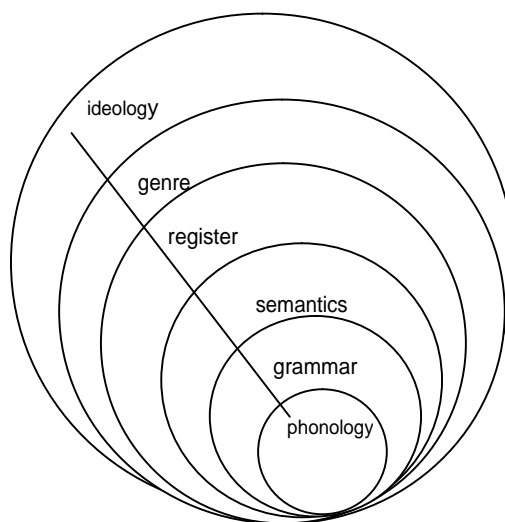


Figure 2.1. Language and its semiotic environment

In 1997, Martin stated that his 1992 model of context “does not appear to have fostered the dialogue among functional linguists and critical theorists” (Martin, 1997, pp. 6-7). He, therefore, suggested the meta-redundancy model (Figure 2.2) as an alternative strategy for enhancing this dialogue. “In such a model, register

(encompassing field, tenor, and mode) contextualizes language and is in turn contextualized by genre” (Martin, 1997, p.7).

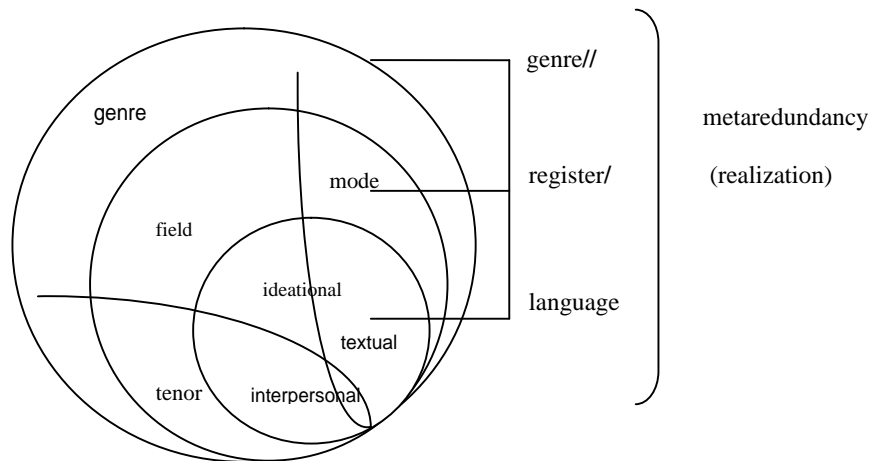


Figure 2.2. Language metaredundancy with register, meta-metaredundancy with genre

To illustrate the bilateral relationship between genre and register on the one hand, and providing a clearer definition of these two constructs on the other hand, Eggins (2004), following Martin’s theory, has considered some pre-requisites for any type of genre to be formed. She poses two questions in this regard:

1. What aspects of situations need to recur for two situations to be felt by interactants to be ‘similar enough’ to call for the habitualized genre?
2. In what aspects of our language use do we see the ‘relatively consistent’ patterns of meaning in recurrent situations? (p. 58)

These questions are, in fact, what systemic linguistics deals with in its *theory of register*. As Eggins (2004) points out, a genre is formed when particular values for *field*, *tenor* and *mode* – being the three main dimensions of situations or context which are identified by *register* – regularly co-occur and eventually become stabilized in the

culture as ‘typical’ situations (Halliday & Hasan, 1985; Halliday & Martin, 1993; Halliday & Matthiessen, 2004; Martin, 1992).

To look at *register* theory from a more down-to-earth view, Eggins (2004) states that this theory “describes the impact of dimensions of the immediate context of situation of a language event on the way language is used” (p.9). Her explanation of register theory can present a more straightforward image of the three dimensions as follows:

... the register variables of **mode** (amount of feedback and role of language), **tenor** (role relations of power and solidarity) and **field** (topic or focus of the activity) are used to explain our intuitive understanding that we will not use language in the same way to write as to speak (mode variation), to talk to our boss as to talk to our lover (tenor variation) and to talk about linguistics as to talk about jogging (field variation). (p.9)

To explain the relationship between genre and register, Eggins (2004), almost indirectly, states that a *genre* develops when the configuration of register variables tend to linguistically recur among the speech community. She gives an example of horoscope texts which “bring together a field of ‘predicting romantic, material, and career events’; a tenor of advice and warning; and a mode of direct address from writer to (generic) reader” (Eggins, 2004, p.58): The situational values realized in the predictable language choices of horoscope texts are stated by Eggins (2004) as follows:

...nouns about love, marriage, physical appearance and acquisition of wealth and attitudinally loaded adjectives; the writer’s use of imperatives (avoid all men with blue eyes); and the use of spoken language features (the pronoun you, elliptical structures) combined with written language techniques of nominalizations (p.58).

According to Eggins (2004), therefore, when certain contextual combinations of register variables; i.e. field, tenor, and mode, become socially stable as ways of interaction of that context, these combinations become habitualized by the members of that society. These processes finally lead to formation of a genre.

#### **2.2.1.5.3. SFL and Scientific Discourse**

Halliday (2004) announces that "Scientific texts are found to be difficult to read; and this is said to be because they are written in 'scientific language', a 'jargon' which has the effect of making the learner feel excluded and alienated from the subject-matter." (Halliday, 2004, p.159). He stresses that it is not only ESL students who find problems with scientific English – so also do many for whom English is the mother tongue.

One view of scientific language is that some people think that it is an unnecessary, more or less ritualistic way of writing, and that scientific concepts and scientific reasoning could just as well be expressed in everyday, non-technical terms. Halliday (2004), however, rejects this idea believing that:

... science is totally dependent on scientific language: that you cannot separate science from how it is written, or rewrite scientific discourse in any other way. If the language is difficult to understand, this is not some additional factor caused by the words that are chosen, but a difficulty that is inherent in the nature of science itself. (p.159)

To identify the distinctive features scientific English possesses and what functions they have in the discourse, Halliday (2004) believes that although technical terms are part of this overall effect, the difficulty lies more with the grammar than with the vocabulary. The problems with technical terminology usually arise not from the

technical terms themselves but from the complex relationship they have with one another. He (2004, p.162) suggested seven headings which can be used for illustrating the characteristics of scientific English:

- (1) interlocking definitions
- (2) technical taxonomies
- (3) special expressions
- (4) lexical density
- (5) syntactic ambiguity
- (6) grammatical metaphor (GM)
- (7) semantic discontinuity

Among these features, Halliday (2004) regards GM more significant because he states that the items (4) and (5), mentioned above, are both by-products of GM. As in the present study, the micro-structures of the medical RAs have been probed in terms of two sub-types of GM, the nature of this source of difficulty of English scientific discourse as well as its different types are elucidated here.

#### **2.2.1.5.3.1. GM in Scientific Discourse**

Although GM has been described, explained, and exemplified extensively by SFL scholars (e.g. Eggins, 2004; Halliday, 1998; Halliday & Martin, 1992; Halliday & Mattiessen, 2004; Martin & Rose, 2007), this linguistic phenomenon is so abstract, and simultaneously ubiquitous, that it can be viewed variously from different angles and views. Halliday (1998) elucidates the formation of GM by means of the rationalization that:

... since the grammar has the power of construing [translating human experience into semiotic system] and being stratified [having different

levels], it can also deconstruct and reconstruct along different lines. Since stratification involves mapping meanings into forms, ‘process’ into verbal and ‘participant’ into nominal, it also allows remapping – say of ‘process’ into a nominal form. (p. 190)

He exemplifies his idea, mentioned above, in the two versions of the same experience; the clause *the driver drove the bus too rapidly down the hill* (the more spoken version) can change into the nominal group *the driver’s overrapid downhill driving of the bus* (the more scientific version). Thus GM, according to Halliday (1998), “is a realignment between a pair of strata: a remapping of the semantics on to the lexicogrammar; hence the term ‘reconstruction’ being used here to refer to it” (p.192).

To elaborate on GM, Martin and Rose (2007) firstly defined lexical metaphor as involving transference of meaning in which a lexical item that normally means one thing comes to mean another. They provided examples for *lexical metaphor* such as, “he and his colleagues acted *like vultures*, meaning that they treated people like prey or carrion” (p. 110). According to Martin and Rose (2007), grammatical metaphors “involve transference of meaning from one kind of element to another kind” (p. 110). This transference occurs when *congruent* structures typifying spoken discourse are used *incongruently (metaphorically)* such as those used in English scientific discourse. Some examples Martin (1992, p.17) provided to illustrate the congruent (spoken) and metaphorical (scientific) versions of three clauses in English have been inserted in Figure 2.3.

A	Ford was unhappy so Trillian left.	Congruent
	Ford's unhappiness led to Trillian's departure.	Metaphorical
B	Zaphord was delighted so Trillian celebrated.	Congruent
	Zaphord's delight resulted in Trillian's celebration.	Metaphorical
C	Marvin was bored and so became miserable.	Congruent
	Marvin's boredom engendered his misery.	Metaphorical

Figure 2.3. Examples of Congruent and Metaphorical Clause Types

Types of GM, being determined based on the three metafunctions of language; consist of ideational – including logical and experiential –, interpersonal, and textual metaphors (Martin, 1992). Since in the present study, the experiential and the logical GMs of certain parts of the selected Iranian and English/American medical RAs have been analyzed, these two types of ideational GM, according to which the discourse of the texts the unpacked, are explained more fully below followed by a brief introduction to the other two types of GM, i.e., interpersonal and textual.

#### 2.2.1.5.3.2. Ideational GM: Experiential

Martin and Rose (2007) considered three options for an experiential GM to be formed, namely; *processes and qualities as things*, *Processes and qualities as qualities of things*, and *things and people as parts of activities-as-things*. As illustrated in Figure 2.4, those transferences from quality to thing (*unhappy* to *unhappiness*) or from process to thing (*left* to *departure*, *delighted* to *delight*, or *celebrated* to *celebration*), occurring

in the participants of the clause, are samples of the first option of experiential GM and instances of *nominalization*.

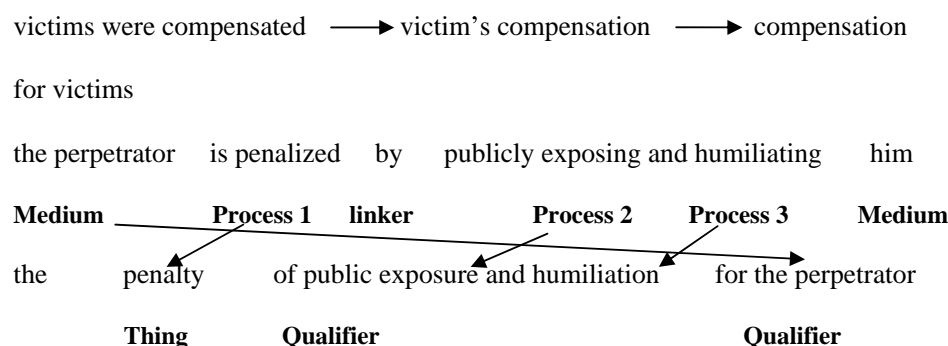
Logical Transference		Experiential Transference		Experiential Transference	
congruent	metaphorical	congruent	metaphorical	congruent	metaphorical
A: <u>So</u> → <u>led to</u>		<u>unhappy</u> → <u>unhappiness</u>		<u>left</u> → <u>departure</u>	
conj.	process	quality	thing	process	thing
B: <u>So</u> → <u>resulted in</u>		<u>delighted</u> → <u>delight</u>		<u>celebrated</u> → <u>celebration</u>	
conj.	process	process	thing	process	thing
C: <u>So</u> → <u>engendered</u>		<u>bored</u> → <u>boredom</u>		<u>miserable</u> → <u>misery</u>	
conj.	process	quality	thing	quality	thing

**Figure 2.4.** Logical and Experiential Transferences of Examples in Table 2.2.

The first type of the second option, *processes as quality of things*, could happen when *secure an area* changes to *a top security area* or *respecting the members* changes to *respected members*.

Instances for the second type of the second option of experiential GM, *quality of process as quality of thing*, according to Martin & Rose (2007), could occur when *operating overseas* changes to *overseas operation*, or when *expose publicly* changes to *public exposure*. Regarding the third option, “participants can be included when processes are reconstrued as things, by presenting them as parts of activities-as-things as possessions” (Martin & Rose, 2007, p.112). The following examples clarify the formation of this type of GM:





The strategies of using the various types of GM “have evolved to enable writers to generalize about social processes, and to describe, classify and evaluate them.... Unpacking ideational metaphors is one key for teaching language learners how they work” (Martin & Rose, 2007, p.112).

### 2.2.1.5.3.3. The Power of Nominalization

To explain about the necessity of using nominalization as the chief type of experiential GM in scientific discourse, Halliday (2004) considers two semiotic conditions which are required to be met in scientific theory; *technicality* and *rationality*. To justify the first condition, Halliday (2004) pointed out that “... the grammar has to create technical meanings, purely virtual phenomena that exist only on the semiotic plane” (p.123). He, then, asserts that nominal group is the most powerful resource helping manage the complexity being inherent in the scientific discourse. The metaphorical examples of Figure 2.3 and the experiential transferences of different grammatical elements to *entity* in Figure 2.4 witness the strength of nominalization in scientific English. The power of “the nominal group is at once both grammatical (its structure potential) and semantic (the nature of entities...). Thus, there is a payoff, both grammatically and semantically, for construing phenomena as nouns” (Halliday, 2004, p.124).

Through giving the example of *glass crack growth rate*, Halliday (2004) demonstrated how GM has been able to create this technical concept:

... power of nominal group is brought into play through progressive nominalizing of the processes and qualities involved: from *glass can crack* (verb) to a *glass crack* (noun); from *glass cracks can grow* to *glass crack growth*; from *glass crack growth is faster or slower* to *glass crack growth rate*.... the new noun is not simply a rewording; it is a remeaning ... (p.126)

*Rationality* in science, as Halliday (2004) argues, is observed when the discourse needs to construct an argument out of a long sequence of connected steps and the previous steps may be organized as grounds for the next. "... once discourse is in motion, the Theme will typically pick up something that has gone before" (p.125). In a chain of reasoning in scientific discourse, the Theme "...typically becomes a résumé of the argument that has gone before; and the only way to package a piece of argument so that it becomes a natural Theme of a clause is to turn it into a nominal group". The following example to illustrate the use of nominalization in the Themes of the clauses to run the rationality of the discourse of science has been derived from Hamilton and Maruhn, (as cited in Halliday, 2004).

The surface of the earth is not strong enough to support a huge mass of mountains without deforming in some way. The deformation leads to a mass deficit under the mountains that compensates the excess mass on the surface.

Compensation of this type is familiar .... (p.125)

#### **2.2.1.5.3.4. Ideational GM: Logical**

The logical sub-division of ideational metafunction deals with conjunction "which looks at interconnections between processes [by means of] adding, comparing,

sequencing, or explaining them. These are logical meanings that link activities and messages in sequences” (Martin & Rose, 2007, p.115). Conjunctions are also reconstrued as other kinds of elements, including processes, things, qualities, and circumstances. “Logical metaphor always involves experiential metaphor as well” (Martin & Rose, 2007, p.148). According to Martin and Rose (2007), conjunctions can be metaphorized in two ways: 1. *Conjunction as process* and, 2. *Conjunctions as things and qualities*. The former occurs when in abstract or technical writing consequential conjunction functions as a process. According to Martin (1992), each of the second members of the sets of the examples in Figure 2.3 is a circumstantial relational clause with a causal verb (*led to*, *resulted in*, and *engendered*) which relates two *nominalizations*. These processes are actually the metaphorical versions of the conjunction *so* (Figure 2.4).

Different ways of reconstrual of *conjunctions as process* and *as things or qualities* are exemplified in Figure 2.5 through illustrating both the congruent and the metaphorical transferences (Examples have been derived from Martin & Rose, 2007, pp. 148-152).

Type of the conjunction	Examples/Transferences
<u>Conj. as process</u>	
Metaphorical	Such a hearing is likely to <i>lead to</i> a miscarriage of justice
Congruent	<i>If</i> such a hearing happens, <i>then</i> justice will be miscarried
Transference	Lead to      —————>      if ....then
<u>Conj. as a thing</u>	
Metaphorical	Amnesty didn't matter. It was only a <i>means</i> to the truth.
Congruent	The truth would come out <i>by</i> amnesty being given.
Transference	Means      —————>      by

**Conj. as quality of thing**

Metaphorical	Many had <i>previously</i> been regarded as respectable members
Congruent	Many had been regarded as respectable members <i>before</i>
Transference	Previously regarded    —————> before

Figure 2.5. Exemplification of Types of Metaphorical Conjunctions

Halliday (1998, pp. 209-210) has listed types of GM he had identified in the course of analyzing instances (Table 2.1). According to him, these types of GM are significant in the unfolding of the scientific texts in general. He, however, has stated that the list might not be exhaustive.

**Table 2.1.** *Halliday's Types of GM (Halliday, 1998, pp. 209-210)*

semantic type			class shift		example
	<b>congruent</b>	<b>metaphorical</b>			
<b>1</b>	quality	event of process	entity	adjective – noun	<i>usable – usability</i>
<b>2i</b>	Process	event of process	entity	verb – noun	<i>transform – transformation</i>
<b>2ii</b>		aspect of phase of		tense/phase verb (adverb) – noun	<i>going to/by – prospect/attempt</i>
<b>2iii</b>		process		modality verb (adverb) – noun	
		modality of process			<i>can, could – possibility; potential</i>
<b>3</b>	circumstance	[minor process]	entity	preposition – noun	<i>with – accompaniment</i>
<b>4</b>	relator		entity	conjunction – noun	<i>so – cause, proof; if – condition</i>
<b>5i</b>	process	event of process	quality	verb – adjective	<i>[poverty] is increasing – increasing poverty</i>
<b>5ii</b>		aspect of phase of process		tense/phase verb (adverb) – adjective	<i>begin – initial</i>
<b>5iii</b>		modality of process		modality of verb (adverb) – adjective	<i>[always] will – constant</i>
<b>6i</b>	circumstance	manner	quality	adverb – adjective	<i>[acted brilliantly] – brilliant [acting]</i>
<b>6ii</b>		time, place, etc	quality	prepositional phase – adjective	<i>[argued for a long time] – lengthy</i>
<b>6iii</b>			class	prep. phrase – noun pre-modifier	<i>[argument] cracks on the surface – surface [cracks]</i>
<b>7</b>	relator		quality	conjunction – adjective	<i>before – previous</i>
<b>8</b>	circumstance		process	Be/go + preposition – verb	<i>be about – concern; be instead of - replace</i>
<b>9</b>	relator		process	conjunction – verb	<i>and – complement; then – follow; so – lead</i>
<b>10</b>	relator		circums	conjunction – prepositional (phrase)	<i>When – in times of; so – as a result</i>
<b>11</b>	0		entity	0 – noun	<i>[x] – the fact of [x]</i>
<b>12</b>	0		process	0 – verb	<i>[x] – [x] occurs</i>
<b>13</b>	entity		modifie	noun – various	<i>engine [fails] – engine [failure];</i>
			r (of		<i>glass fracture – [the fracture] of glass;</i>
			entity)		<i>cabinet [decided] – government's decision</i>

Halliday's viewpoints of features of scientific language have attracted the attention of a great number of scholars and curriculum planners, especially, those who are engaged in providing materials for teaching science in schools. Therefore, various research studies have been conducted and several books have been written on this appealing subject matter.

#### **2.2.1.7. Genre in Rhetorical Studies**

Understanding of genre as social actions developed within Rhetorical Genre Studies (RGS), or the New Rhetoric, since Miller's seminal article *Genre as social action*. According to Lunsford (2007), *new* rhetoric emerged in the 1960s in a deep commitment to provide a robust theoretical and historical foundation for the teaching of writing to all undergraduate students through the revival of the ancient art of Aristotelian rhetoric. What was new in this version of rhetoric was "the very self-conscious linking of rhetoric with writing or composition" (Lunsford, 2007, p. 5).

Unlike ESP and SFL traditions which start from context but end up with text analysis, the focus of genre in Rhetorical Genre Studies (RGS) did not emerge out of a pedagogical imperative to dealing with text. For RGS, "context is viewed as an ongoing, inter-subjective performance, one that is mediated by genres and other culturally available tools" (Bawarishi & Reiff, 2010, p. 59). Genres are, therefore, environments which can create communication as Bazerman (1997) puts it:

Genres are not just forms. Genres are forms of life, ways of being. They are frames for social action. They are environments for learning. They are locations within which meaning is constructed. Genres shape the thoughts we form and the communication by which we interact. Genres are the familiar places we go to create intelligible communicative action

with each other and the guideposts we use to explore the unfamiliar.

(p.1)

Miller's ideas in *Genre as Social Action* (1994) reveal the influences she has received from the scholars like Bitzer and Campbell & Jamieson, Burke, and Schutz in her understanding of genre. In the description of the principles used to classify discourse, she refers to Campbell and Jamieson's (1978, pp. 18-19) rhetorical *substance* and *form* as *semantics* and *syntactics*, respectively. She, however, calls the rhetorical *action* that the discourse performs as *pragmatics* and reiterates that "a theoretically sound definition of genre must be centered not on the substance or the form of discourse but on the action it is used to accomplish" (Miller, 1994, p.23). She states clearly that she admits Campbell & Jamieson's views that "a genre is composed of a constellation of recognizable forms bound together by an internal dynamic.... a genre is given its character by a fusion of forms not by its individual elements" (Campbell & Jamieson, 1978, p.21). According to Miller, Bitzer's *exigence* in his definition of *rhetorical situation* (1968, p. 13) is parallel to the demand-response vocabulary that Campbell & Jamieson adopted. According to her, "the exigence provides the rhetor with a socially recognizable way to make his or her intentions known.... [it is a] social motive.... Except in a primitive sense, our motives are not private or idiosyncratic; they are products of our socialization" (Miller, 1994, p. 30). Miller follows Burke's view that "Motives are distinctly linguistic products. We discern situational patterns by means of the particular vocabulary of the cultural group into which we are born." (Burke, as cited in Miller, 1994, p.31). She, then, presents the way Schutz relates motive to typification as "typified patterns of the other's behavior become in turn motives of my own actions" (Schutz, as cited in Miller, 1994, p.31).

Miller (1994) finally presents total particular features of her understanding of genre as follows:

1. Genre refers to a conventional category of discourse based in large scale typification of rhetorical action; as action, it acquires meaning from the social context in which that situation arose.
2. As meaningful action, genre is interpretable by means of rules; genre rules occur at a relatively high level on a hierarchy of rules for symbolic interaction.
3. Genre is distinct from form: form is the more general term used at all levels of the hierarchy. Genre is a form at one particular level that is a fusion of lower level forms and characteristic substance.
4. Genre serves as the substance of forms at higher levels; as recurrent patterns of language use. Genres help constitute the substance of our cultural life.
5. A genre is a rhetorical means for mediating private intentions and social exigence; it motivates by connecting the private with the public, the singular with the recurrent.

Another outstanding figure of North American genre studies, Bazerman, relates genre to cognitive development believing that a “connection between Vygotskian socio-cognitive theory and genre has been implicit in almost all the works from the North American Genre theory perspective” (Bazerman, 2009, p.279). He has stressed more on the pedagogical orientation of RGS through advocating the Writing to Learn (WTL) movement claiming that “writing can help us move to a new stage of thinking” (Bazerman, 2009, p.279) and explaining that during writing we learn new details which can help us hold all the pieces of the big picture together without changing our way of



viewing things. In a writing assignment, students can be put in a position to combine information and ideas in ways new to them, or to consider issues from an unfamiliar stance. He calls this phenomenon as “cognitive refiguration” (Bazerman, 2009, p.280).

#### **2.2.1.8. Berkenkotter and Huckin’s Theoretical Framework of Genre Conception**

Berkenkotter and Huckin (1995) have developed a theoretical view of genre which has grounded in the theoretical constructs of influential disciplines and writers including structuration theory in sociology, rhetorical studies, interpretive anthropology, ethnomethodology, Bakhtin’s theory of speech genres, Vygotsky’s theory of ontogenesis, Russian activity theory, and, finally, psychology called *situated* or *everyday* cognition. From their research into the above-mentioned literature, they developed frequently-cited five principles of genre conception that has constituted a theoretical framework in its own right. These principles are as follows:

*Dynamism.* Genres are dynamic rhetorical forms that are developed from actors’ responses to recurrent situations and that serve to stabilize experience and give it coherence and meaning. Genres change over time in response to their users’ sociocognitive needs.

*Situatedness.* Our knowledge of genres is derived from and embedded in our participation in the communicative activities of daily and professional life. As such, genre knowledge is a form of “situated cognition” that constitutes to develop as we participate in the activities of the ambient culture.

*Form and Content.* Genre knowledge embraces both form and content, including a sense of what content is appropriate to particular purpose in a particular situation at a particular purpose in time.

*Duality of Structure.* As we draw on genre rules to engage in professional activities, we *constitute* social structures (in professional, institutional, and organizational contexts) and simultaneously *reproduce* these structures.

*Community Ownership.* Genre conventions signal a discourse community's norms, epistemology, ideology, and social ontology. (Berkenkotter & Huckin, 1995, p.4)

### **2.2.2. Medical Discourse: A Historical Overview**

According to Gotti (2006), it was during the 15<sup>th</sup> century that due to the increasing need of using a vernacular language for the expression of specialized texts, English language prevailed over Latin. In medical studies, the evolution of the methods and the development of new surgical procedures indicated a change in the expression of opinions and description of the phenomena. However, gradually criticism arose of the suitability of the tool for an accurate and precise expression of the concepts in medicine such as limited number of vernacular anatomical terms or the polysemy characterizing many words which often made texts ambiguous. The solution was found to be coining new terms through the two principles of; firstly, using the resources of the native tongue, either by giving a specialized meaning to an existing word or forming a new one, and secondly, borrowing a similar term from a foreign language, particularly from Latin and Greek as these two languages were endowed with large and respected specialized lexicon. The remarkable increase in the number of new medical terms is in line with the great expansion of the Early Modern English lexicon as a whole with intense borrowing in all fields (Finkenstaedt et al, as cited in Gotti, 2006). The medical sciences seem to reach their peak in the first half of the 17<sup>th</sup> century. Gotti (2006) continues that “in adopting the loan words, the translator usually adapted the word he

was borrowing to the morphological features of the receiving language [English] ... but generally the original suffix was replaced by the one commonly used in English (p. 676).

Since the 17<sup>th</sup> century, as medical science becomes more widespread, there will be more need for well-designed medical academic genres in order to: first, complement research findings; second, avoid the repetition of the experiments without any valuable results; and third, to control new diseases (Piqué-Angordans & Posteguillo, 2006). To name of a few written genres in medical communication the following can be highlighted: editorials, research articles, abstracts, case reports, review articles, peer reviews, replies to these reviews, letters of acceptance/rejection of a paper, conference programs, medical popularizations, letters of application, book reviews, and letters to the editor. Apart from these genres, some journals, such as *The New England Journal of Medicine*, feature ‘special articles’ which are usually cases from the registry of the Massachusetts General Hospital.

It should be mentioned that medical papers are basically organized following IMRAD (Introduction, methods, Results, And Discussion) macrostructure and “their mode of referencing, through the so-called Vancouver system, has been considered since it was agreed on at a meeting of medical journal editors in Vancouver, Canada, held in 1978” (Piqué-Angordans & Posteguillo, 2006, p. 653).

During the same period, 17<sup>th</sup> century, in the syntactic features of medical English, some significant changes took place but not in an explicit way, as does in the lexical field because “specialists were usually unaware of the syntactic modifications that they were introducing into the language by means of their writings” (Gotti, 2006, p. 679). Gotti (2006) describes the changes in medical discourse as: increase in the length of the sentences due to very lengthy noun phrases preceding and following the verb which is,

in turn, only forms of verb *to be*, preference for coordination rather than subordination in sentence structure, application of a large number of words referring to processes and a distinct preference for the use of nouns deriving from verbs. Adoption of nominalization, as explained above, enables the scientists to include more information in the same sentence, thus more concise texts and a better flow of discourse. As nominalization recovers the information given in the previous statement as the theme of the next sentence, it promotes a better cohesion as well. This linguistic preference commonly referred to as ‘grammatical metaphor’ within ‘Systemic Functional Linguistics’ has become one of the salient features of scientific discourse.

### **2.2.3. Contrastive Rhetoric**

Contrastive rhetoric (CR) “which examines differences and similarities in ESL and EFL writing across languages and cultures as well as across such different contexts as languages and commerce” (Connor, 2002, p.493) started following Kaplan’s (1966) study on paragraph organization in ESL student essays. Observing five types of paragraph development reflecting distinctive rhetorical tendencies, Kaplan claimed that students had transferred the linguistic patterns and rhetorical conventions of their L1 into their L2 productions. Since then, the issue has preserved a status as a practicable niche of linguistic inquiry. Although the field today contributes to knowledge about preferred patterns of writing in many English for specific purposes situations, it has had an impact in the understanding of cultural differences in writing and teaching of ESL and EFL writing.

According to more clarifications Kaplan (2000) has made on the purpose of CR, the field “assumes that languages differ not only in phonological, morphological, and grammatical features [based on Contrastive Analysis theory of the Audio-Lingual

approach], but in the kinds of genres available to their speakers for the organization of discourse and in the rhetorical (and syntactic) features that co-occur with those genres” (Kaplan, 2000, p. viii). He cites Enkvist’s idea that the text is the father of the sentence, and that text strategies come before the syntactic formation of individual sentences. He states an assumption of CR that genres are nothing more or less than conventional solutions to recurring communication problems. Students of other languages may bring with them a rich inventory of genres peculiar to their mother tongues. There may nevertheless “be a mismatch between the genres in the other language and those in English, or the genres may serve unexpected purposes, or the co-occurring syntactic features may be quite different” (Kaplan, 2000, p. xi).

#### **2.2.3.1. Critical Views on CR and the Defenses/New Directions**

Despite its contribution to ESL and EFL teaching, CR has been under criticism ever since its development due to its focus on the consideration of cultural/linguistic differences between English language used by native and non-native speakers. Zamel (1997), for instance, argues that through viewing our ESL/EFL students as fixed by their world views as being less capable of critical thought or analysis, we, in fact, limit our expectations of them, misread and underestimate what their works represent, under-conceptualize the readings and writings we ask them to do and, consequently, reduce the instructions. Scollon (1997), on the other hand, while implicitly referring to the diagrams Kaplan and other followers of CR provide to show the linguistic/cultural structures of particular languages, claims that “a very broad range of studies have shown that no language or culture can be reduced to one or two diagrammatic structures” (Scollon, 1997, p. 353). He (1997), however, admits that strong clear evidence, “amply demonstrated across the languages of the world, shows that there are situationally,

generically, or stylistically preferred compositional forms and that these are not the same from language to language or from culturally defined situation to culturally defined situation” (p. 353).

To reply to the criticism that CR restricts the learner’s freedom to experiment due to condemning deviant forms of discourse, Kaplan maintains that:

... to the extent that CR tries to inculcate Standard American Schooled English, it is guilty of limiting learner’s freedom to use other discourse structures. Learners are free to pursue whatever experimentation they wish, once they have control of some basic standard. *To the extent that such experimentation may result in texts that constitute mazes defying comprehension, it may be inappropriate to encourage experimentation.* (Kaplan, 2000, p. xv)

Connor (1996, 2002, 2004, & 2008) has attempted to make some modifications to the claims made by CR by means of bringing in new directions into the field. In 1996, she stated that “the [weak version of] Sapir-Whorf hypothesis of linguistic relativity is basic to contrastive rhetoric because it suggests that different languages *affect perception and thought* in different ways [rather than the once dominant strong version of language *controls thought*]” (Connor, 1996, p. 10).

#### **2.2.3.2. Current Status of CR**

Despite all the controversies attributed to CR, the field is being incrementally developed and strengthened especially due to the increasing importance of English language as the dominant international language. Speakers of other languages, especially those who are engaged in ESP and EAP, are expected to communicate

effectively in a global context. Apart from other fields of applied linguistics, CR has also been employed by the researchers to help English learners of other languages to become aware of differences (and similarities) between the rhetorical conventions of academic writing in their native language and English.

Newer views to look at culture have currently been added to CR trend in an attempt to promote its theoretical framework as well as moving it from the EAP study of student essays to the study of writing in many disciplines and genres. Atkinson (2004), for instance, suggests a place to incorporate studies on “unequal power relations and the role of conflict in describing cultural influences and processes” (Atkinson, 2004, p. 287). According to Connor (2004), “... there has been a call for reexamination of methods of intercultural rhetoric so that the increasing number of empirical [quantitatively oriented textual] studies can build a cohesive set. Such a concentrated effort would help establish the field and enhance the generalizability of the applications” (p. 291). In her 2008 study, Connor presents still further innovative ideas to the field suggesting the umbrella term *intercultural rhetoric* – proposed earlier in her 2004 study – instead of contrastive rhetoric. She finds the term suitable for both cross-cultural and intercultural studies in order to describe the current scope of cultural influences in writing and to connote the direction the field needs to go. The term is expected to suggest that:

... no rhetorical tradition is pure but that everything exists between cultures.... All cultures and social practices are deeply infused and penetrated by other cultural practices. In this sense, the “inter” of intercultural stresses the *connections* rather than the cultural and rhetorical *differences*. (Connor, 2008, p. 27)

Figure 2.2. proposed in her 2008 study, illustrates the complexity of the various cultures affecting a writer's rhetorical style.

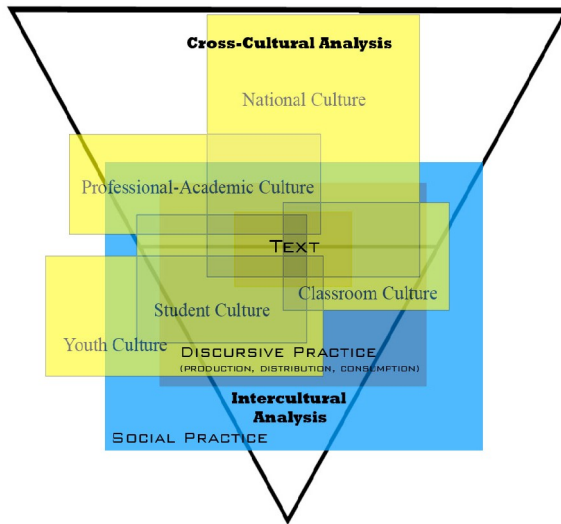


Figure 2.3. Multi-layered Model of Contrastive Rhetoric

Susilo (2007), while supporting the new rhetoric view for bilingual/multilingual writers, points out that deviations from the normative should not be considered as signs of unproficiency (Susilo's term) or interference, but as critical/alternate discursive choices. He argues that:

The reason behind his argument is the notion of hybrid nature of culture as a consequence of postmodern world that in the postmodern world ... which brings about considerable interaction, borrowing, and fusion between cultures and communication genres .... Contrastive rhetoric, in this view, is meant shuttling and negotiating thought between different communities. (Susilo, 2007, p.100)



#### 2.2.4. The Emergence of World Englishes Movement

Throughout the world, following the necessity of using a common language in order to launch various aspects of human relationship, English language rapidly spread to become an international language. However, nowadays, as many nonnative varieties of English become standardized, hence *nativized*, English is no longer viewed as a worldwide *lingua franca*. The result was the emergence of viewing these varieties as different forms of *World Englishes*, a term coined by Kachru. The conceptualization of World Englishes within a theoretical framework goes back to the early 1960s, but formal and functional implications of the concept initiated in 1978 in two independent international conferences. The first being organized by Larry E. Smith in Hawaii, USA, and the second by Braj B. Kachru in Illinois, USA. The major issues discussed at these conferences included the sociolinguistic and political contexts of the countries where English is used as a nonnative language, the factors which determine the retention of English in these countries, and the sociolinguistic and linguistic profile of each variety with reference to their *range* of functions and *depth* of social penetration (Kachru, 1995).

Based on the ideas underlying World Englishes, during recent decades the earlier distinction of English as a native (ENL), second (ESL), and foreign (EFL) language has come under attack. The alternative classification was suggested by Kachru in 1985 (and later) in terms of three concentric circles: the Inner Circle, the Outer Circle, and the Expanding Circle (Figure 2.3.). The circles are defined as follows:

The Inner Circle represents the traditional bases of English, dominated by the “mother tongue” varieties of the language. In Outer Circle, English has been institutionalized as an additional language. ... The Expanding Circle includes the rest of the world where English is used as the primary foreign

language, and the uses of English are unpredictably increasing. (Kachru, 1985, p. 19)

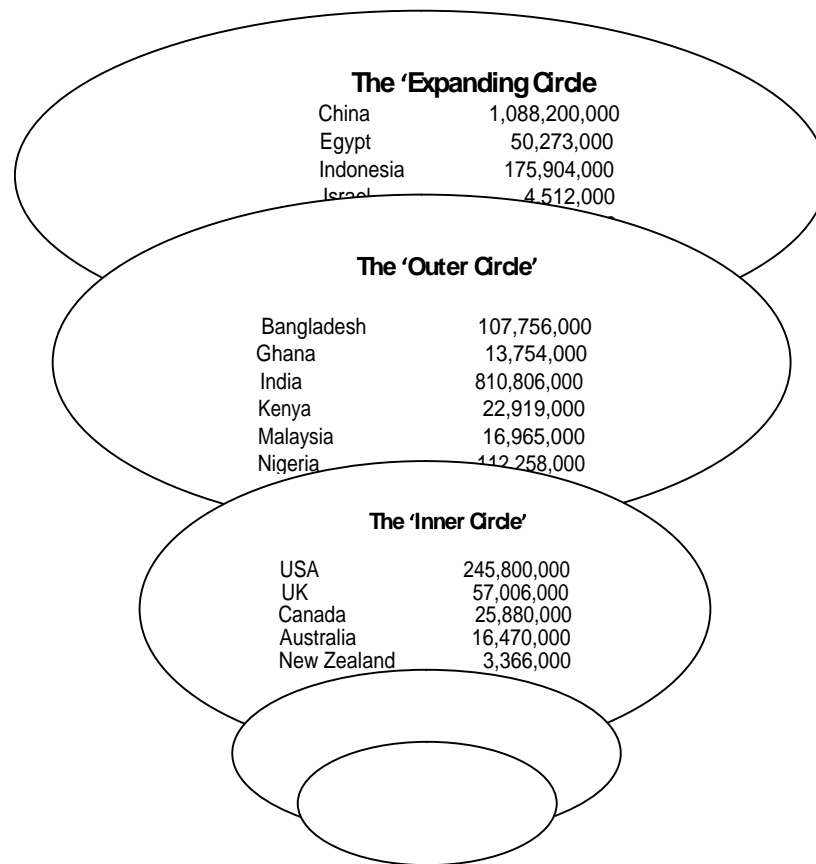


Figure 2.4. The concentric circles of the varieties of English language

According to Kachru (1995, pp.238-241), as the varieties of English language are obtaining different norms, the countries of the three above-mentioned circles can be classified into having three different positions with regard to these norms: *norm-providing*, *norm-developing*, and *norm-dependent*. American and British Englishes are the *norm-providing* varieties as they are still considered more appropriate and used mostly by the countries of the Expanding Circle. The *norm-developing* speech fellowships are institutionalized in the Outer Circle. Among the users of these varieties, there is confusion between linguistic norm and linguistic performance, but generally the localized norm has a well-established linguistic and cultural identity, e.g., Singapore English, Nigerian English, Indian English, etc. The *norm-dependent* varieties are used

in the Expanding Circle, e.g., Korea, Iran, Saudi Arabia, etc.. The long-term contact of speakers of other languages with English results in *nativization* and *acculturation*. Nativization occurs when a localized linguistic identity of an English variety is created (e.g., Indian English, Scottish English) while acculturation gives the English variety a distinct local cultural identity. Due to these two phenomena, in the writings of the institutionalized varieties of English there are style-shifts which are related to the underlying sociolinguistic and cultural context. “The result of such style-shifts, appropriate to non-Western cultural contexts, is new discourse strategies, use of distinctly different speech acts, and development of new registers in English (Kachru, 1995, p.241).

According to the literature in the area of World Englishes, it can be easily observed that the majority of the issues are related to the Outer Circle. According to Kachru (1995, p.239), two of the major issues are:

- What determines the difference between an *error* or a *mistake* [which does not conform to the English of the Inner Circle] and an *innovation*?
- What are the variables of *intelligibility* for World Englishes across languages and cultures?

The two constructs of *intelligibility*, *innovation*, and other related ones are of crucial importance as in the production of knowledge, the interaction among disciplinary cultures is essential and it is the function of written communication which acts as the instrument to facilitate the relationship. This mode of communication, however, requires codification which is carried out by means of relevant generic forms of writing. “Genres are intimately linked to a discipline’s methodology, and they package information in ways that conform to a discipline’s norms, values, and ideology” (Berkenkotter & Huckin, 1995, p.1). Writers, therefore, must know how to

utilize the particular genre they deal with in order to publish, exert influence on their field of study, and finally, be cited by their peers. The writers “must understand the directions in which a field is developing at any given time and possess the rhetorical savvy necessary for positioning their work within it. An academic writer needs to possess a highly developed sense of timing” (Berkenkotter & Huckin, 1995, p.3).

The controversial and complicated issues of the intelligibility of non-native writers of English and the importance of the considerable share these writers can offer in the production of knowledge can be more intricate when their rhetorical styles are evaluated by either journal editors or those involved in journal selection processes.

#### **2.2.5. Journal/Article Evaluation**

Institute for Scientific Information (ISI), now known as Thomson Reuters, claims to provide comprehensive coverage of the world’s most influential journals to make information retrieval possible of its subscribers. The *Web of Science*, today, covers over 9000 regional and international journals and book series in natural sciences, social sciences, as well as arts and humanities. To explain why not all published journals can be covered by Thomson Reuters, Eugene Garfield, Founder and Chairman Emeritus of ISI, refers (1979) to Bradford Law that a relatively small number of journals publish the bulk of significant scientific results. According to Garfield (1994), citations, done by publishing research authors, can manifest the conceptual association of scientific ideas. These authors, by the references they cite in their papers, provide linkages between their own research and the prior works in the archive of scientific literature. Therefore, explicit referencing implies that an author has found useful a particular published work which can contain a significant idea, theory, or finding. Thomson Reuters databases index these intellectual transactions by listing both

the cited and citing works. The citation indexes were originally designed primarily for information retrieval by means of a variety of citation-based search strategies including bibliographic coupling, linking of papers through shared references, keywords, and others. Thus, by starting with a single paper or book, it can be determined which other additional papers have referred to it, and each retrieved paper, in turn, can provide a new list of references with which to continue the citation process.

Garfield (1994) stresses that the citation-based connections within the literature are made by authors themselves. Traditional indexes typically rely on human subject specialists to categorize and describe papers which required reading or scanning papers and make subjective judgments. This can cause an inevitable delay while citation indexing is virtually concurrent with the literature. In addition, traditional indexes limit the number of terms due to the expense of human indexing, but in Thomson Reuters citation indexes, the resulting number of index entries is correspondingly high because a typical research paper today contains from 25 to 35 references. As stated by Garfield (1995), it was in 1990 that ISI introduced this citation-based method of derivative (algorithmic) subject indexing called Key-Word Plus which enhances retrievability through supplying more words and phrases to the pre-existing ones including title words, author-supplied keywords, and/or abstract words. These Key-Words Plus terms are derived from the titles of cited papers, which have been algorithmically processed to identify the most-commonly recurring words and phrases. Another advantage of retrievability of research studies, as expressed by Garfield (1994), is preventing the unintentional duplication of the ideas presented or discoveries made previously.

#### **2.2.5.1. Impact Factor**

*Journal Citation Reports (JCR)*, which is based on the citation analysis, can benefit the user in a number of ways: journal ranking and evaluation, maintaining trends which can be gleaned from the various listings, including the source data, the half-life, and the cited and citing journal listings.

It is claimed by Garfield (1994b) that a journal reputation may not tell the complete story about its impact on the scholarly community. He cites Christenson and Sigelman 1985's study showing that there is a nonlinear relationship between a journal's reputation and its impact, especially at the extremes of the prestige scale. The *JCR* satisfies the need for quantitative measures. It provides a detailed picture of the scientific literature. It shows the journal-to-journal relationship and permits the discerning user to track important trends or changes over the years, such as a shift from pure to applied research. The changes are not always reflected in the names of the journals. For instance, while the title of the journal of Experimental Medicine conveys one image, its primary focus today is in fact immunology.

#### **2.2.5.2. The Evaluation Process**

Journal evaluation and selection is ongoing at Thomson Reuters and as frequently as every two weeks journals are added and deleted from the database. Journals covered are monitored to ensure that they are maintaining high standards. The journal selection process, described below, is applied to all journals in Web of Science, whether covered in *Science Citation Index Expanded*, *Social Sciences Citation Index*, or *Arts & Humanities Citation Index*. Many factors are taken into account when evaluating journals for coverage ranging from the qualitative to the quantitative: the journal's basic publishing standards, its editorial content, the international diversity of its authorship,

and the citation data associated with it are all considered. No one factor is considered in isolation, but by combining and interrelating the data, the editor is able to determine the journal's overall strengths and weaknesses. The Thomson Reuters editors performing journal evaluations have educational background relevant to their areas of responsibility as well as experience and education in information science.

### **2.2.5.3. Basic Journal Standards**

A journal must be published according to its stated frequency in order to be considered for initial inclusion in the Thomson Reuters database. The ability to publish on time implies a healthy backlog of manuscripts essential for ongoing viability. The journal should follow international editorial conventions which include informative journal titles, fully descriptive article titles and abstracts, complete bibliographic information for all cited references, and full address information for every author. Thomson Reuters focuses on journals that publish full text in English or at very least, their bibliographic information in English with full text in another language. Application of peer review process is another indication of journal standards and indicates overall quality of the research presented and the completeness of cited references. The editors in Thomas Reuters look for International Diversity among the contributing authors and the journal's editors and Editorial Advisory Board members. This is particularly important in journals targeting an international audience. Selection criteria for regional journals are the same as for international journals although citation analyses play a somewhat different role in the outcome. For example, the importance of the regional journal would be measured more in terms of the specificity of its content. Will it enrich our coverage of a particular subject or provide studies with a specific regional perspective? Many excellent regional journals target a local rather than an



international audience. All regional journals selected must be published on time, have English-language bibliographic information (title, abstract, keywords), and be peer reviewed. Cited references must be in the Roman alphabet. (James Testa, Senior Director, Editorial Development, Thomson Reuters)

### **2.3. The Related Studies**

In this section, the most significant related non-Iranian ESP and SFL genre analysis studies as well as those of the Iranian ones have been mentioned and explained. Those studies which are closely relevant to the hypotheses of the present study, i.e. studies analyzing the Moves/Sub-moves of medical RAs, have been elaborated on more than the others so that their findings could be compared/contrasted with the findings of this study in the Discussion Section of the present study.

#### **2.3.1. Studies on GM/Nominalization in Scientific Discourse**

SFL notion of GM was reappraised in Sàñez's (2000) paper from the perspective of cognitive linguistics. He points to some weak or incomplete aspects of ideational GM within the standard account of this phenomenon by examining them in the light of some well-established ideas of conceptual metaphor and notionally defined grammatical categories. The considerations of a theoretical nature discussed in the paper, according to Sàñez (2000), have the probability of improving the effectiveness of this resource as a tool for text analysis because "they allow to account for otherwise unexplained meaning in terms of very generic conceptualization patterns" (p. 509).

Ideational GM in English and German languages was again the focus of a cross-linguistic study performed by Steiner (2002-2003) in which the notion of *direct* vs. *indirect* mapping of experiential and logical semantics onto lexicogrammar was

revisited. It has been argued that directness of encoding within one language has to be defined with by the concept of *transparency* or *motivation* of encoding between levels. Moreover, across languages, a realization which is structurally identical or similar may be more or less metaphorical. It was also shown that *explicitness* is closely related to, but not the same as *directness*. It, therefore, has to be applied in operationalizations of *metaphoricity*. It has also been argued that “‘shifts’ between logical and experiential encodings cannot straightforwardly be mapped onto classifications as ‘congruent’ or ‘direct’ in the absence of a cross-linguistic semantics to serve as a basis to establish ‘motivation’ and ‘transparency’” (Steiner, 2002-2003, p. 158). It was also pointed out that the grammatical systems involved in languages can predict only some of the differences. Registeral, processing, and beyond that cultural factors can determine other tendencies in languages. The study has strived to show that the two types of GMs “have very different implications for the metaphoricity of the clause and very different implications for the density of the packaging of meaning” (p. 158).

The major objective of Sušinskiensė’s (2004) study was to establish functional peculiarities of GMs included in the simple sentence focusing on non-gerundive nominalizations based on material processes. 1.500 pages including 10.500 nominalizations were selected from different genres of scientific discourse – linguistics, history, philosophy, and economics. The three parts of the study concentrated firstly on presenting the phenomenon of GM, secondly, on inherent (non-circumstantial) functions of the GMs, and thirdly, on the non-inherent (circumstantial) functions. In the corpus examined, nominalized propositions practically expressed the same semantic and syntactic functions as their non-process counterparts. The difference only concerned the frequency of occurrence.

To investigate the possibility that Latin had some influence on the development of the use of nominalization (the most significant type of ideational GM) in scientific discourse, in Banks' (2005) study, a short extract from Newton's *Philosophiae Naturalis Principia Mathematica*, published in 1687, was compared to its contemporary English translation by Motte, published in 1729. It was revealed that nominalizations in Motte's translation are paralleled by nominalizations in the Latin original. Banks (2005) has concluded that the possibility of Latin influence on the early development of scientific English cannot be ruled out.

Colombi (2006) attempted to describe GM, the particular lexicogrammatical resource that Spanish uses to realize academic language. The paper presented three types of GMs as a way of explicating and tracing the development of academic language at the college level in heritage speakers of Spanish (Colombi, 2006). The purpose of this longitudinal study was to reach insights which could contribute to setting an agenda for the curriculum in Spanish as a heritage language in the United States. For a period of one year in a program of Spanish for Native Speakers, students' writing and oral presentations were followed with the purpose of analyzing the development of literate language. The study depicted that in Spanish, like English, nominalizing is the single most powerful resource for creating GM. The Spanish nominal group is, like its English counterparts, the most frequent resource for making meaning in academic texts.

In his study of GM analysis of modern prose fiction (MPF), Farahani & Hadidi (2008) aimed to bring out how GM is deployed in this untapped area, as opposed to such a deployment in the language of science, by focusing on Harry Potter series which, according to Farahani & Hadidi (2008), "is most representative of MPF discursively and generically" (p. 51). The findings supported the fact that the pivotal mainstay of GM in

MPF was found to be Prepositional GM (PGM) which was so ubiquitous that it gave rise to a fundamental structure for adverbials in MPF and, simultaneously, merged to other types of GM, particularly with double-barreled GM (DBGM) and S/T presentation when they were PGM at the same time. Moreover, it was found that “ontogenesis is not at work in MPF ... since children at their earliest ages of using language do use such GM” (Farahani & Hadidi, p.78).

### **2.3.2. Iranian Studies on GM/Nominalization**

As a part of a study concerning conceptology in Persian word formation, Sanaati (2008) has investigated if sole application of each of the three areas of linguistic inquiry; namely, structural semantics, Systemic Functional Grammar, and cognitive semantics could be adequately efficient in describing the formation of common and proper words, in general and specialized Persian language respectively. The data (words) were derived from Sokhan Concise Dictionary, Dekhoda Dictionary, Contemporary Culture of Persian Language, and Dictionary of Farhangestan’s Approved Words.

According to Sanaati (2008) the results indicated that each of the above-mentioned theories was shown to play an essential, but not adequate, role in the description of conceptology in word formation in Persian language. Structural semantics, for instance, could maintain the paradigmatic and syntagmatic relationship among the data. Cognitive semantics, on the other hand, was relevant to the formation of schemas, metaphors, figures, and grounds. Finally, Systemic Functional Grammar could explain the reason of the presence of far more number of nouns compared to adjectives and verbs in Persian scientific discourse through the process of nominalization/GM formation. Comparing this finding with that of Colombi’s (2006) shows that in both

Spanish and Persian academic languages, like English language, the number of nouns is much more than adjectives and verbs due to the process of nominalization.

### 2.3.3. Studies Analyzing EAP RA Genre Types

According to Swales (1990), the revised *Create a Research Space* (CARS) model (Figure 2.1) has been able to capture a number of characteristics of RA introductions including the need to re-establish in the eyes of the discourse community the significance of the research field itself; the need to ‘situate’ the actual research in terms of that significance; and the need to show how this niche in the wider ecosystem will be occupied and defended. It follows that the amount of rhetorical work needed to create such a space depends on the existing ecological competition, on the size and importance of the niche to be established, and on various other factors such as the writer’s reputation. (Swales, 1990, p.141)

**Table 2.2.** *CARS model for article introductions*

Move 1	Establishing a territory	
	Step 1	Claiming centrality And/or
	Step 2	Making topic generalizations And/or
	Step 3	Reviewing items of previous research
Move 2	Establishing a niche	
	Step 1A	Counter-claiming or
	Step 1B	Indicating a gap or
	Step 1C	Question-raising or
	Step 1D	Continuing a tradition
Move 3	Occupying the niche	
	Step1A	Outlining purposes or

Step 1B	Announcing present research
Step 2	Announcing principal findings
Step 3	Indicating RA structure

Following Swales' seminal 1990 work on article introductions, different types of genres in academic written English, namely, textbooks, different sections of research articles and papers (especially their introductions), abstracts, theses and dissertations and their titles were analyzed in various EAP fields of study.

Much research has been done on the organizational patterns of RAs. There are works on the RA Introduction section (e.g. Swales, 1981, 1990), the Results section (e.g. Brett, 1994, in sociology RAs), on the Discussion section (e.g. Holmes, 1997 in sociology, political science and history RAs; Berkenkotter & Huckin, 1995 across a wide range of sciences; Hopkins & Dudley Evans, 1988, in articles and dissertations; Peacock, 2002, across seven disciplines), on all the four sections (e.g. Kanoksilapatham, 2005, in biochemistry), on the schematic structure of literature reviews (Kawn, 2005 in doctoral theses of Applied Linguistics), on academic spoken discourse (Thompson, 1994, on discipline areas of applied linguistics, engineering, and medicine), and finally, on titles of review papers and research papers (Soler, 2007, in selected disciplines of social sciences and biological sciences).

Of the studies mentioned above, (except that Berkenkotter and Huckin relate their analysis of the Discussion to the Introduction and Yang & Allison (2003) who have moved from Result to Conclusions) appear to treat each RA section as an independent entity and have not taken account of various possibilities when the influence of the other sections on the organization of an individual section, or when a Move (or Moves) of one section, appear(s) in another section. This neglect is also apparent in Nwogu's study.

#### **2.3.4. English-Persian Contrastive Studies on EAP Genre Types**

To date, numerous English-Persian contrastive genre analysis studies in different academic disciplines have inspected the differences between the rhetoric of Persian native speakers and that of the English ones or between English and Persian writing performances of Persian native speakers with respect to a variety of features such as the macro-structures/Moves employed in the sections of RAs and other types of texts, use of hedges/metadiscourse markers, and L1-L2 rhetorical patterns. The purpose of these studies has usually been uncovering the probable specific unique cultural features of the rhetoric of Iranian writers which could have been transferred into their English performances. These features might have the potentiality of impairing the intelligibility of the English content produced by a Persian native speaker if contradict the rhetorical features of English language. Extracting these potential discrepancies from the related comparative/contrastive studies in literature – as has been done below – could have drastic impact on the present study as far as understanding the possible deviations/idiosyncrasies in writing medical RAs of Iranian writers are concerned.

#### **2.3.4.1. Move Analysis**

The rhetorical Move pattern of Iranian TEFL students' thesis introductions has been studied by Bandary (1999) cross-culturally with the purpose of examining the universality of introduction section of RA genre using Dudley-Evans' Six-Move model (1989) for thesis Introductions. The findings revealed that the introduction sections of Iranian students' MA theses on TEFL had the same constituent moves as those of English ones with some slight differences in the order and distribution.

A notable example of English-Persian contrastive genre-based studies having worked on both micro- and macrostructures of the articles, Atai and Falah (2004) have contrasted the Results and the Discussion sections of articles on applied linguistics

written by English and Persian native speakers (ENS & PNS) using models proposed by Brett (1994) and Swales (1990) for Results and Discussion sections respectively. The study also investigated the discussion sections of applied linguistics RAs with respect to evaluated entities (EE) and ascribed values (AV) based on Thetela's 1997 model for evaluative language of these sections. The findings showed that although not all the moves suggested by Brett (1994) appeared in the corpus, both ENS & PNS writers tended to use similar moves in the Results section. However, Atai & Falah (2004) have stated that concerning the moves of the Discussion section, *unexpected outcome* and *generalizability* were absent in PNS corpus. ENS writers, on the other hand, used *explanation* and *recommendation* more frequently than their PNS counterparts. According to the authors, these differences might be due to the peculiar conventions of the genre of RAs of the discipline or the cultural differences between English and Persian native speakers. Regarding the evaluative language, it was shown that ENS writers made more frequent use of evaluative lexis in the Discussion section. Moreover, the larger number of EEs and the variety in AVs in ENS corpus, according to Atai and Falah (2004) has been an evidence for the more interactive nature of the style of these writers.

#### **2.3.4.2. Metadiscourse Markers/Hedges**

Regarding genre-based studies comparing/contrasting the microstructural aspects of the rhetoric of the native speakers of English and Persian, hedging has been viewed by Falahati (1994) in English and Persian academic discourses.

Marandi (2003), for instance, investigated the impact of language/culture on the use of two types of metadiscourse markers, *textual* (including connectives, topicalizers, reminders, intention markers, and interpretive markers) and *interpersonal* (including



hedges, emphatics, attributors, persona markers, and relational markers) in the introductions and discussions of the Master's theses of three groups: native Iranian speakers of Persian, non-native Iranian speakers of English, and native British speakers of English (Master's theses of TEFL, TESL, and Education respectively). The findings showed that "on the whole, textual metadiscourse was [justifiably] used significantly more in introductions than in discussions" (Marandi, 2003, p.39). It was also found that native speakers of English used significantly more hedging and less attributors than native speakers of Persian and more persona markers than non-native speakers of English. No significant difference was observed in the use of topicalizers, emphatics, and relational markers. Marandi (2003) has quite cautiously proposed some possible interpretations for these findings. She, however, has generally suggested metadiscourse markers be studied more objectively, scientifically, and coherently within the realm of Systemic Functional Grammar.

Concerning both medical and applied linguistics RAs in English, the Results and the Discussion sections of these articles written by English and Persian native speakers (ENS and PNS) have been contrasted by Mohammadi Khahan (2006) in terms of types and frequencies of the hedges and the boosters used in 120 selected RAs of the two disciplines based on Salager-Mayer (1995) and Hyland's (1996) models of hedges as well as Vassileva's model of boosters. No significant difference was found between the frequency of the hedges and the boosters either across nationality (ENS vs. PNS) or the section type (Results vs. Discussion). This finding does not confirm Marandi's (2003) study.

Jalilifar (2007) probed context and frequency of hedges in 40 humanities and natural sciences articles written by English and Iranian RA writers. Results indicated that hedging may be used differently, but not significantly, by native speakers of

English and Persian. This finding is in line with Mohammadi Khahan's (2006) study, but does not confirm Marandi's (2003). In Jallilifar's (2007) study, however, Persian writers used hedges more in contexts different from those used by English ones.

Interactive and interactional types of metadiscourse markers have been examined in the Discussion sections of Applied Linguistics RAs by Faghih and Rahimpour (2009) through analyzing 90 articles written by native speakers of English, Iranian articles in English, and Iranian articles in Persian in an attempt to understand the cultural differences between Persian and English-speaking researchers employing Hyland's (2005) model of metadiscourse sub-types including transitions, frame markers, endophoric markers, evidentials, code glosses, hedges, boosters, attitude markers, engagement markers, and self-mentions; the first five comprising interactive metadiscourse, and the rest interactional metadiscourse. The findings showed that native speakers of English had employed more interactional metadiscourse but slightly less interactive forms than Iranians. As hedging is a kind of interactional metadiscourse marker, this finding is in accordance with Marandi's (2003) study but not in line with Jallilifar's (2007). Faghih and Rahimpour (2009) also found that frame markers and code glosses were used more by Iranians (in both articles in English and Persian) than native speakers of English. Regarding the two groups of Iranians, it was observed that evidentials, code glosses, attitude markers, engagement markers, and self-mentions were used more when Iranians wrote in Persian. On the other hand, transitions, frame markers, endophoric markers, hedges, and boosters were used more when they wrote in English.

Use of metadiscourse was again examined by Abdi (2009) in 36 Persian and 36 English RAs of six different disciplines (three hard and three soft sciences) in an attempt to "find out if Persian native speakers take on the identity and norms of the

discourse community in writing in their own language or preserve the cultural identity and norms of their native language” (Abdi, 2009, p.1). The findings revealed that there are more similarities in the application of interactive metadiscourse (used to guide the readers). Significant differences were, however, found in the employment of interactional metadiscourse which, according to Abdi (2009) could represent the specific cultural identity of the Persian writers. The most significant difference was in self-mentions. Persian writers tend to be more positivistic and keep their discourse impersonal. English writers extensively used hedges while Persian writers’ use of hedges is quite limited. In the case of attitude markers, English writers “more frequently opt for markers to communicate their emotions presumably aimed at building a more human relationship with the readers .... perhaps according to Persian culture, there is no need to overtly mark and develop such a relationship” (Abdi, 2009, p.11). These results are in line with Marandi (2003) and Faghih and Rahimpour’s (2009) findings, but do not confirm those of Jalilifar (2007) and Mohammadi Khahan (2006). Surprisingly, according to Abdi (2009) Persian hard science writers, although more associated with positivism, employed self-mentions significantly more.

Metadiscourse functions in sociology articles in Persian and English has been analyzed in a study carried out by Shokouhi and Talati Baghsiahi (2009). They found that text connectors are the first and modality markers are the second most frequently employed metadiscourse markers in both languages although English writers employed twice the number of these markers. It was further shown that the Persian writers of sociology texts are not equally interested in explicitly orienting the readers. These findings further support Marandi (2003) as well as Faghih and Rahimpour’s (2009) results.

Rashidi and Souzandehfar (2010) investigated two selected metatext (or metadiscourse) categories, previews and reviews (Crismore & Farnsworth, 1990, as cited in Rashidi & Souzandehfar, 2010, p.7), or endophoric markers (Hyland, as cited in Rashidi & Souzandehfar, 2010, p. 7) in five major sections of 16 English and Persian RAs from the field of Economics. The analysis was based on the assumption that “the selected metatext categories are typically used more frequently in a writer-responsible language/culture, since they contribute to the explicitness of text organization and subsequently to the clarity and coherence of a text” (Rashidi & Souzandehfar, 2010, p.7). Mauranen’s 1993 categories of metatext were used for the analysis of the corpus. The results showed that there are far more previews and reviews in the English articles than in the Persian ones. These results do not apparently support Faghih And Rahimpour’s finding concerning the use of interactive forms used by English and Persian writers. This contradictory finding could be related either to the rhetorical differences between the two disciplines of economics and applied linguistics RAs, or the inadequate number of the selected articles in Rashidi & Souzandehfar’s (2010) study.

#### **2.3.4.3. L1/ L2 Rhetorical Patterns**

To the best knowledge of the present researcher, the first study traced in the literature of contrastive cultural thought patterns between English and Persian writers dates back to Katchen’s (1982) study which focused on the rhetorical structures of compositions written in Farsi and compared them to the compositions produced by American writers. The study “grew out of a project organized to compare the expository writing of various language groups with American English expository prose style.... Farsi subjects [18 in number] were all graduate students at The Pennsylvania State

University in Spring, 1982” (Katchen, 1982, p. 166). To minimize the influence of English language and style, the study focused on the rhetorical structures of compositions written in Farsi which were, then, translated by a native speaker of Farsi into English.

Because the order of presentation of ideas was considered to be of primary importance in the study, a word for word parsing type translation was not considered crucial to the analysis. The translated texts were compared with those written by 15 American native speakers on the same topic. The analysis showed that at the level of paragraph, of the 18 Farsi paragraphs, only 2 contained clear topic sentences, and 3 others, all in one essay, were questionable. This is in contrast to the American paragraphs; 10 contained clear topic sentences, and of the 5 that did not, 3 were in introductory or concluding paragraphs. Thus it can tentatively be said that American paragraphs typically contain topic sentences, whereas Farsi compositions typically do not. According to Katchen (1982):

Farsi compositions contain not only binary structures of general statement/specific statement and statement/contrast, but also the development ... in which the new information at the end of one sentence becomes the old or given information of the next sentence. (pp. 178-179)

Alikhani (1997) probed the idea of go-togetherness between Farsi and English writing abilities of 80 Iranian students. The participants wrote 3 rhetorical types of composition – classification, argumentation, and definition – in both languages. The compositions were then assessed by 3 Farsi and 3 English raters. The analysis showed that those who produced better writing in their mother tongue did not necessarily write better in English. It has been implied that “L2 writing product is a somewhat different construct from L1 writing” (Alikhani 1997, p. vi). The finding of this study agrees with

that of Katchen (1982) suggesting that writing in any language is tied firmly to the peculiar culture of the rhetoric of that language. Regarding the three different rhetorical types, “participants performed significantly better when addressing argumentation and definition rhetorical types than classification” (Alikhani, 1997, p. vii). In the study, it has been inferred that at the earlier stages of teaching composition, certain rhetorical types could be more beneficial than the others.

### **2.3.5. Studies Analyzing the Discursive Patterns of Medical RAs**

As Nwogu’s 1997 study constitutes the model for the Move analysis of the present article, here, the historical development of genre analysis of medical RAs has been divided into three periods: the studies carried out before 1997, Nwogu’s 1997 study itself, and the studies performed after 1997.

#### **2.3.5.1. Studies Before 1997**

In medical field, until the publication of Nwogu's article in 1997, studies into features of written medical discourse have mostly tended to focus on the syntactic features of text (e.g. Dubios, 1981, on the construction of noun phrases in biomedical journal articles; Malcolm, 1987, on the rules governing tense usage in scientific articles; Pettinari, 1982 on the functions of grammatical alternation in fourteen surgical reports; Salager, 1986 on the classificatory framework and rhetorical function of the specialist medical English lexis).

Only a few studies have attempted to investigate the organization of information in scientific research reports. Among these studies Adams Smith’ 1984 study has been an attempt to determine how, why, and where the subjective elements of the authors’ comments are introduced in the main categories of articles in medical journals. The

results of the study revealed that author's comment is expressed by verbal and nonverbal modals and by a wide range of attitudinal markers. These, however, appear with various incidences in different categories of articles, "editorials being more author-marked throughout, while clinical case notes and research papers contain sharp differences between the objective recounting of the methods and results sections and the more subjective discussion or comment sections" (Adams Smith 1984, p.25). In the article, it has been recommended that sufficient expressions of emphasis, advice, and evaluation should be included in the materials for students of English for medical sciences.

The study carried out by Salager-Meyer (1994) attempted to determine how the communicative purpose of the different rhetorical sections of research papers and case reports in medical English written discourse influences the frequency and category distribution of hedges used in each section. 'The results indicated that the Discussion/comment sections are the most heavily hedged sections, whereas the Methods and the Case Report sections are the least-hedged rhetorical divisions (Salager Meyer, 1994). Apparently, this result is in accordance with Adams Smith's 1984 study as one of the influential factor of the higher subjectivity of the Discussion section is the frequent occurrence of the hedges by the author which is manifested especially through the use of modals.

During the course of the history of genre analysis of medical RAs, the first investigation analyzing thoroughly the Moves of the four sections of the articles has been attributed to Skelton who described "the structure of original research papers published in the *British Journal of General Practice* to help researchers and trainers to write and teach writing medical RAs more successfully" (Skelton, 1994, p. 455). He examined 50 original papers published in the same journal between January 1989 and

March 1993 using Swales' Move analysis technique in applied linguistics. In his study, Moves, to be recognized, had to occur in the same section of the paper in 65% of the corpus, and/or appear in the same order relative to other Moves in 50% of the cases. The analysis resulted in 15 Moves, four in the introduction, three in the method, four in the results, and four in the discussion.

As genre understanding developed during the previous two decades, so the points of concentration in research have grown to become more delicate, hence, more complex and a tendency toward deploying simultaneous employment of different linguistic theories started to arise. The issues faced by genre education, especially in ESP as a distinguished branch of applied linguistics, now call for more insights from linguistic theories dealing with both macro- and microstructures. Gledhill's study (1995), for instance, attempted to integrate the ethnographic approach of Swales' genre analysis with the large scale analysis of phraseology of Sinclair's corpus linguistics in order to characterize the phraseology of grammatical items in various sections of 150 cancer RAs namely Titles, Abstracts, Introductions, Methods, Results, and discussions. The study found that collocation varied systematically in rhetorical sections, and the concept of phraseology was postulated as a preferred way of expressing a delimited set of semantic and communicative roles.

#### **2.3.5.2. Nwogu's 1997 Study**

Nwogu (1997) analyzed the moves deployed in different sections of medical RAs. Nwogu's (1997, p 120), article accounts for the schematic structure of information in the medical research paper using Swales' (1981, 1990) genre-analysis model although Nwogu's study represents an application of the model beyond Swales' article introduction to the whole body of the research article. In his article, Nwogu further



states that except perhaps for Skelton (1994) who examined the structure of original research papers and Gosden (1992, 1993) who examined the discourse functions of theme in the scientific research article, most genre-based investigations into the research article have focused on isolated sections (e.g. Swales 1981; Cooper 1985; Hopkins 1985; Crookes 1986 for the article introduction; Belanger 1982; Peng, 1987; Hopkins & Dudley-Evans, 1988 for the discussion section).

While comparing his study with Skelton's (1994), Nwogu argues that both studies characterize the structure of information in medical research paper and both adopt a genre-analysis approach to their descriptions. Skelton's study is, however, intended for a non-specialist audience, i.e. general medical practitioners, which in itself limit the extent of the linguistic analysis that is provided to support observations and claims made in the paper. Nwogu's paper, on the other hand, is written for specialists in the field of Linguistics. Therefore, as he himself claims (1997, p.120), his paper describes moves with greater linguistic depth and rigor than Skelton's. In addition, Skelton in his account does not characterize the sub-moves, each performing as a move by itself, as being done in Nwogu's study.

The schema Nwogu (1997) finally identified, regarding the four sections of the medical RAs, comprised eleven moves, out of which 8 were found to be 'normally required' (2, 3, 4, 5, 7, 9, 10, 11) and three 'optional' (1, 6, 8). Nwogu (1997, p. 125) has presented the extracted eleven moves together with their discourse functions (Table 2.7).

**Table 2.3.** *Moves and Sub-moves of the Four Sections of Medical Research Articles*  
(Nwogu, 1997)

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<i>Introduction</i>	
Move 1:	Presenting background information: <ul style="list-style-type: none"> <li>(1) Reference to established knowledge of the field</li> <li>(2) Reference to main research problems</li> </ul>
Move 2:	Reviewing related research: <ul style="list-style-type: none"> <li>(1) Reference to previous research</li> <li>(2) Reference to limitations of previous research</li> </ul>
Move 3:	Presenting new research: <ul style="list-style-type: none"> <li>(1) Reference to research Purpose research research</li> <li>(2) Reference to main research procedure</li> </ul>
<i>Methods</i>	
Move 4:	Describing data collection procedure: <ul style="list-style-type: none"> <li>(1) Indicating source of data</li> <li>(2) Indicating data size</li> <li>(3) Indicating criteria for data collection research</li> </ul>
Move 5:	Describing experimental procedure: <ul style="list-style-type: none"> <li>(1) Identification of main research apparatus</li> <li>(2) Recounting experimental process</li> <li>(3) Indicating criteria for success</li> </ul>
Move 6:	Describing data analysis procedures: <ul style="list-style-type: none"> <li>(1) Defining terminologies</li> <li>(2) Indicating process of data classification</li> <li>(3) Identifying analytical instrument/procedure</li> </ul>
<i>Results</i>	
Move 7:	Indicating consistent observation: <ul style="list-style-type: none"> <li>(1) Highlighting overall observation</li> <li>(2) Indicating specific onservations</li> <li>(3) Accounting for observations made</li> </ul>
Move 8:	Indicating non-consistent observations

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*Discussion*

Move 9:	Highlighting overall research outcome
Move 10:	Explaining specific research outcomes: <ul style="list-style-type: none"><li>(1) Stating a specific outcome</li><li>(2) Interpreting the outcome</li><li>(3) Indicating significance of the outcome</li><li>(4) Contrasting present and previous outcomes</li><li>(5) Indicating limitation of outcomes</li></ul>
Move 11:	Stating research conclusions: <ul style="list-style-type: none"><li>(1) Indicating research implications</li><li>(2) Promoting further research</li></ul>

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It can be said that since 1997, Nwogu's study has remained the most comprehensive one of its kind in the genre analysis of English medical RAs.

#### **2.3.5.3. Studies After Nwogu's 1997 Study**

Twelve years after Nwogu's study, Li and Ge (2009), analyzed the frequency of occurrence of the 11 moves identified by Nwogu (1997) as a part of their study in 25 RAs published between 1985 and 1989 and 25 RAs published between 2000 and 2004. The findings, revealed that time, have affected the structural and linguistic features of medical RAs showing that in the articles published between 2000 and 2004, Moves 1 and 6 changed from being 'optional' to 'obligatory' whereas Move 9 switched from 'obligatory' to 'optional'. Move 8 remained an 'optional' one. These findings indicated that present-day medical RA writers are more willing to present introductions of the established knowledge of the subject matter (Move 1) as well as elaborating on their data collection procedure (Move 6). Yet, they "tend to adopt a more direct approach to presenting their research results (Move 9). Instead of highlighting overall research outcome, they prefer to begin their discussion by directly explaining specific

outcomes....to use induction rather than deduction to develop their discussion (Li & Ge, 2009, p.99).

Marco (2000) also followed a genre approach to study the grammatical frameworks in the medical research paper. She analyzed the use of collocational frameworks or discontinuous sequences of words, in a corpus of medical research papers and described the intermediate words, or collocates, which fill these frameworks.

A study which can manifest this tendency is Méndez-Cendón and López-Arroyo (2003) which intended to discover the semantic strategies present in scientific research papers and abstracts through the description of some favorite rhetorical and phraseological structures (such as collocations, irreversible binomials, idioms, routine formulae and combinatorial patterns) inherent to scientific knowledge in these genres. Having adopted Nwogu's 1997 model on medical research papers and abstracts, they found out that:

...research paper sections are divided into different moves made up of steps but abstracts only include moves without steps. ... Although *Discussion* sections of research papers do not seem to have a parallel section in the abstracts, our study has shown that the *Conclusion* sections of abstracts include the information held in that section.... As to the phraseological analysis, data obtained in our analysis show that *study* is used with the meaning of 'paper, research' in the *Introduction* and *Discussion* sections, whereas it is used with the meaning of 'exploration, examination' in the *Materials and Methods* and *Results* sections. (Méndez-Cendón & López-Arroyo, 2003, p. )

The titles of medical research articles have been the area of concentration of a syntactic corpus-based study carried out by Wang and Bai (2007). They believe that the

quality of the titles of these articles can affect the impact factors of the articles, because it is the title which affects the reader's decision whether to read the whole article. The results showed that nominal groups, including 'unihead', 'bi-head', and 'multi-head', were widely used in the corpus with a frequency of 99% while the remaining titles began with a gerund.

#### **2.3.5.4. Contrastive Studies on Medical RAs**

Review of the literature on genre analysis of medical RAs shows that some studies have also been conducted to compare/contrast the styles of native speakers of English with those of other languages. Ricart Vayá (2008) divided the Conclusion sections of English and Spanish medical RAs into four moves; Background, Summarizing, Limitation, and Further Research. Based on the similarities and differences of the moves in the two languages, she found equivalences in the linguistic patterns among the moves.

#### **2.3.6. English-Persian Contrastive Studies on Medical RAs**

In Iranian context, one contrastive study has been conducted by Mahzari (2007) in which she has analyzed the Introduction section of E-A medical Ras and that of Iranian ones in Persian language. The results of her study has revealed that "both in English and Persian, the Introduction section of research articles are similar regarding their move frequency, but the realization of the moves are radically different in these two languages" (Mahzari, 2007, p1033). What she means by 'the realization of the moves', is equivalent to Nwogu's Sub-moves.

### **2.3.7. The Gap in Literature and the Present Study**

As it is witnessed by the literature, in the case of analyzing the genre of articles in medical journals in English written by Iranian writers, no study has been carried out to scrutinize different sections of these articles from either Move analysis or SFL analysis point of view to manifest the strengths/weaknesses of the rhetoric of these articles as well as their probable intrinsic cultural peculiarities.

## **Chapter Three: Method**

### 3.1. Introduction

The present study aimed to provide a detailed description of the rhetorical features of medical RAs published in Iranian medical journals in English and trace their probable strengths and weaknesses. This purpose has been actualized through following the two goals of carrying out a *macro-structural* and a *micro-structural* comparisons between the rhetorical features of the articles from Iranian medical journals and those from English/American ones. The two distinct but underneath complementary goals of the study thus entailed two phases of Move analysis and GM (Grammatical Metaphor) analysis based on two approaches of genre analysis in applied linguistics, namely, ESP (English for Specific Purposes) and SFL (Systemic Functional Linguistics), respectively.

The Move analysis phase was accomplished through applying the results of Nwogu's (1997) study on three groups of randomly-selected articles published in ISI E-A, ISI Iranian and non-ISI Iranian medical RAs (research articles) and the GM analysis phase has been conducted on Sub-moves 10.1, 10.2, and 10.4 of the Discussion sections of two groups of ISI Iranian and E-A articles of the corpus by means of adapting Halliday's (1998) account of types of GM in scientific discourse (cf. Table 2.5).

This descriptive study, using Seliger and Shohamy's (1989) classifications, has taken both *analytic* and *synthetic* approaches. The analytic approach of the present study, being deductive and quantitative in nature, constitutes the analyses being done using the two pre-specified models following the research questions maintained initially. The study, on the other hand, has simultaneously strived to view the texts *synthetically* along the way in order to allow other facts emerge from the rhetorical styles of each group of the articles. The synthetic approach employed has mainly been carried out qualitatively.



This chapter dealing with the method of the study introduces the population and the samples selected, the instruments applied, the procedures followed, and the data analysis performed in the two phases of the study.

### **3.2. The Corpus and the Samples of the Study**

#### **3.2.1. The Corpus**

Medical journals may contain different types of articles including, Research Articles, Special Articles, Review Articles, Commentaries, Editorials, Case Reports, etc. The corpus of this study consists of only the Research Articles (also called Original Articles in some journals) in English, having the standard IMRD (Introduction, Methods, Results, and Discussion) structure published in Type A (four ISI Iranian journals), Type B (four non-ISI Iranian journals), and Type C (four ISI E-A journals) (Table 3.1) between January 2008 and February 2009. The criteria for journal selection were representativeness, reputation, accessibility, and having no relation to particular medical specialty.

To observe the content validity of the ESP Move analysis phase of the present study, Type C journals of the population, the ISI E-A journals, were the same journals used in the model of ESP Move analysis phase of the study, i.e. Nwogu's (1997) study. Another advantage of using these journals was their online free accessibility. They consisted of two English and two American medical journals (Table 3.1).

The criteria for selecting Type A and type B journals were the general non-specialized nature of the journals, online availability of the articles, and, finally, the higher degree of popularity and reputation among Iranian and foreign members of discourse community. Type A journals, being registered by ISI (recently Thompson Reuters), had already gained the criteria of being selected for this study. Type B

journals, although being non-ISI, were mostly registered by other international indexing systems, such as Scopus, Index Medicus, Pub Med, Medline, etc. It is worth mentioning that some of Iranian non-ISI journals were not available online. For instance, the researcher's access to one of these journals, i.e. *Medical Journal of Islamic Republic of Iran*, was quite accidental.

Table 3.1: *The Selected Journals and Their Related URLs*

Journal type	The Selected Journals	The Related URL
<u>Type A:</u>	<i>Archives of Iranian Medicine (AIM)</i>	<a href="http://www.sid.ir/en/isi_iran.asp">http://www.sid.ir/en/isi_iran.asp</a>
ISI Iranian Journals	<i>Journal of Research in Medical Sciences (JRMS)</i> <i>Iranian Red Crescent Medical Journal (IRCMJ)</i> <i>Iranian Journal of Public Health (IJPH)</i>	(last retrieved, Jan 2010)
<u>Type B:</u>	<i>Iranian Journal of Medical Sciences (IJMS)</i>	<a href="http://iranmedex.net/english/list.asp">http://iranmedex.net/english/list.asp</a>
Non-ISI Iranian Journals	<i>Medical Journal of Islamic Republic of Iran (MJIRI)</i> <i>Shiraz E-Medical Journal (SEMJ)</i> <i>Acta Medica Iranica (AMI)</i>	(last retrieved, Jan 2010)
<u>Type C:</u>	<i>The British Medical Journal (BMJ)</i>	<a href="http://science.thomsonreuters.com/index.html">http://science.thomsonreuters.com/index.html</a>
ISI E-A Journals	<i>The New England Journal of Medicine (NEJM)</i> <i>The Journal of Clinical Investigation (JCI)</i> <i>The Journal of American Medical Association (JAMA)</i>	(last retrieved, Jan 2010)

### **3.2.2. Justification for Selecting ISI and Non-ISI Groups of Journals**

Selecting two groups of Iranian ISI and non-ISI medical journals as well as another group of E-A ISI medical journals has been carried out since ISI journals have always enjoyed the highest degree of prestige and credibility. Any published article especially that of an ISI journal, is actually the result of the rhetorical styles of both the writers of the articles and the editors of the journals. As claimed by the founder of ISI, recently Thomson Reuters<sup>1</sup>, journals selected by ISI are the world's most influential journals. These journals are expected to publish articles with the highest quality of content and rhetorical styles. The articles of these journals are, therefore, supposed to be screened by native or native-like minds.

Taking the above-mentioned assumptions into account, in the current study, no significant difference was, therefore, expected to exist between the results of the use of the moves/macro-structures as well as the GM uses of the two groups of ISI Iranian and ISI E-A (English-American) medical articles. Probable differences may account for either the strengths/weaknesses of one or more groups of the articles or the cultural differences in the rhetorical styles of the native writers of either English or Persian Language. Significant differences, on the other hand, were expected to exist between the results of data analysis of the articles selected from non-ISI Iranian medical journals with those obtained from either of the other two groups of ISI journals, i.e. English/American and Iranian ones. The present study was conducted to examine these probabilities.

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<sup>1</sup> [http://thomsonreuters.com/products\\_services/science/free/essays/](http://thomsonreuters.com/products_services/science/free/essays/)

### **3.2.3. The Samples of the Study**

The samples of the study consisted of 96 articles (Appendix 2) categorized into three groups: IrISI, IrNISI, and E-A articles. Each group consisted of 32 articles selected respectively from Type A (ISI Iranian journals), Type B (non-ISI Iranian journals), and Type C (ISI E-A journals).

### **3.2.4. The Process of Random Selection of the Samples**

Before performing random samples selection, it was first necessary to have an easy access to the articles which were regarded as the corpus of the study. To do so, all the articles (Research Articles/Original Articles) of the 12 above-mentioned journals published within the period specified above were listed. The numbers of the listed articles of the journals differed due to the variety in the publication frequency of the journals. The corpus of the present study, therefore, comprised 1156 articles, including 53 from IJPH, 37 from JRMS, 54 from IRCMJ, 69 from AIM, 61 from AMI, 25 from SEMJ, 25 from MJIRI, 205 from BMJ, 92 from JAMA, 207 from NEJM, and 328 from JCI.

Although the journals were published either quarterly, bimonthly, monthly, or weekly; during random selection, equal number of articles, i.e. eight articles, were selected from among the articles of each journal irrespective of the differences of the frequency of annual publications among the journals. Articles were selected by means of *stattrek stratified random sampling* which was available online at <http://stattrek.com/Tables/Random.aspx> (last retrieved, March 2009). Random sampling was carried out 12 times for the 12 types of the journals to select eight articles from each journal.

### 3.3. Instrumentation

The instruments applied in the analytic approach of scrutinizing the samples of the present study consisted of two models. The first model was taken from Nwogu's (1997) for ESP genre analysis and the second model was adopted from Halliday's (1998) table of types of GM in scientific discourse (please refer to Table 2.5).

#### 3.3.1. Model 1: For the Analytic Approach to ESP Move Analysis

The first model employed in the study is actually the results of Nwogu's (1997) study on the structure and functions of medical research papers in which he extended Swales' (1981 & 1990) genre analysis model to all sections of the medical research paper. The schema he finally identified comprised eleven moves together with their Sub-moves. Table 3.2 illustrates the Model's extracted eleven moves of all sections of the medical RAs together with their discourse functions.

**Table 3. 2:** *Moves and their Discourse Functions (Adapted from Nwogu, 1997)*

Move	Discourse function	Section
1:	Presenting Background Information	The Introduction Section
2:	Reviewing Related Research	
3:	Presenting New Research	
4:	Describing Data Collection Procedure	The Methods Section
5:	Describing Experimental Procedure	
6:	Describing Data-Analysis Procedure	
7:	Indicating Consistent Observations	The Results Section
8:	Indicating Non-Consistent Observations	

- 9: Highlighting Overall Research Outcome
- 10: Explaining Specific Research Outcomes      The Discussion Section
- 11: Stating Research Conclusions
- 

In Table 3.3, however, the Sub-moves of only the Introduction and the Discussion sections of Nwogu's 1997 full Model has been presented since the research questions of the ESP Move analysis phase of the present study deals with only these two sections of the articles of the samples.

**Table 3.3:** *Moves and Sub-moves of the Introduction and the Discussion sections of medical research articles (Nwogu, 1997)*

Moves	Sub-moves
<b>The Introduction Section</b>	
1. Presenting Background Information	
by:	1. Reference to established knowledge in the field 2. Reference to main research problems
2. Reviewing Related Research	
by:	1. Reference to previous research 2. Reference to limitations of previous research
3. Presenting New Research	
by:	1. Reference to research purpose 2. Reference to main research procedure
<b>The Discussion Section</b>	
9. Highlighting Overall Research Outcome	
10. Explaining Specific Research Outcomes	
by:	1. Stating a specific outcome 2. Interpreting the outcome 3. Indicating significance of the outcome 4. Contrasting present and previous outcomes 5. Indicating limitations of outcomes
11. Stating Research Conclusions	

1. Indicating research implications
  2. promoting further research
- 

### **3.3.2. Model II: For the Analytic Approach to SFL Analysis**

The second model, which focuses on a micro-structural aspect from SFL perspective, was the adoption of Halliday's (1998) types of GM in scientific discourse. In the original version of the table (Table 2.5) presented by Halliday (1998), as the illustration and categorization of the most common types of GM usually found in scientific discourse, the three types of GM ,i.e. interpersonal, experiential, and logical, have been offered. As in the present study, the related texts of the second phase have been analyzed based on the two sub-types of ideational GM, i.e. experiential and logical, the two types of interpersonal GM (2iii and 5iii in Halliday's 1998 original version) have not been taken into account. The modified version of this table (Table 3.5) has been applied as the GM analysis instrument for the SFL analysis phase of the present study. Of the 17 types of ideational GM in Table 3.5, 13 types (1, 2i, 2ii, 3, 5i, 5ii, 6i, 6ii, 6iii, 8, 11, 12, and 13) are experiential and the remaining four types (4, 7, 9, and 10) are logical.

Table 3.4. *Halliday's (1998) Types of Ideational GM in Scientific Discourse*

semantic type			class shift		example
	congruent	metaphorical			
1	quality	event of process	entity	adjective – noun	<i>usable – usability</i>
2i	process	event of process	entity	verb – noun	<i>transform – transformation</i>
2ii		aspect of phase of		tense/phase verb (adverb) – noun	<i>going to/try – prospect/attempt</i>
3	circumstance	[minor process]	entity	preposition – noun	<i>with – accompaniment</i>
4	relator		entity	conjunction – noun	<i>so – cause, proof; if – condition</i>
5i	process	event of process	quality	verb – adjective	<i>[poverty] is increasing – increasing poverty</i>
5ii		aspect of phase of process		tense/phase verb (adverb) –	<i>begin – initial</i>
6i	circumstance	manner	quality	adverb – adjective	<i>[acted brilliantly] – brilliant [acting]</i>
6ii		time, place, etc	quality	prepositional phase – adjective	<i>[argued for a long time] – lengthy [argument]</i>
6iii			class	prep. phrase – noun pre-modifier	<i>cracks on the surface – surface [cracks]</i>
7	relator		quality	conjunction – adjective	<i>before – previous</i>
8	circumstance		process	Be/go + preposition – verb	<i>be about – concern; be instead of - replace</i>
9	relator		process	conjunction – verb	<i>and – complement; then – follow; so – lead to</i>
10	relator		circumstance	conjunction – prepositional	<i>When – in times of; so – as a result</i>
11	0		entity	0 – noun	<i>[x] – the fact of [x]</i>
12	0		process	0 – verb	<i>[x] – [x] occurs</i>
13	entity		modifier (of	noun – various	<i>engine [fails] – engine [failure];</i>
			entity)		<i>glass fracture – [the fracture] of glass;</i>



### **3.4. Procedures**

#### **3.4.1. Phase 1: ESP Move Analysis**

The ESP/organizational/macro-structural/genre analysis of the articles based on the analytic approach was conducted through analyzing the Introduction and Discussion sections of all articles based on Nwogu's 1997 model to discover how the articles employed the moves/Sub-moves the model presented. The synthetic analysis of this phase was carried out along the way to detect each group's possible rhetorical features which could not be predicted by the researcher in advance, thus not being covered by the research questions.

##### **3.4.1.1. Move Identification**

To identify the Moves/Sub-moves, propositions were considered to be the unit of analysis since each proposition can generally have an independent communicative purpose although sometimes a Move or a Sub-move can be as long as one or more paragraphs. Some Moves/Sub-moves had been used more than once in some of the selected articles based on the demands from the subject matters of those articles. However, despite the frequent use of some Moves/Sub-moves in most articles, as the frequency of using/not using a Move/Sub-move was the matter of concentration, only a single use of a particular Move or Sub-move was considered sufficient for any article to be included in the frequencies. Although implied, this procedure has also been followed by Nwogu (1997) or Li and Ge (2009). This fact can be inferred from Nwogu's study by the number of each Move or sub-move employed in the articles none of which has exceeded the whole number of the articles, i.e. 15 (Nwogu, 1997, p.125). In the present study, Moves and their constituents were determined partly through their ideational functions in the related context and partly with the aid of metadiscourse signals which,

according to Hyland (2005, p.28), are explicit textual devices representing the writer's overt attempt to create a particular pragmatic or discursive effect.

### 3.4.1.2. Intra-rater and Inter-rater Reliability

To avoid subjectivity, the complete Introduction and Discussion sections of three randomly selected articles from the samples were analyzed by the researcher twice with an interval of more than two weeks. Another PhD student of TEFL (Rater 2) as well as an MA holder of TEFL (Rater 3), both having been teaching medical English for several years, were asked to analyze the same sections of the same articles after receiving sufficient training in how to do the task. As can be observed from Table 3.4, the obtained high correlation coefficient between the two ratings done by the researcher (intra-rater reliability,  $\rho = 0.805$ ) and among the three ratings (inter-rater reliabilities,  $\rho = 0.616, 0.754$  and  $0.697$ ) reveals the high reliability of the researcher's judgments in analyzing the texts.

**Table 3.5:** *Intra- rater and Inter-rater Reliability of Move and Sub-move Identification*

Reliability	Raters	Spearman Corr.	Sig.(2- tailed)
Intra-rater	1(1) -1(2)	.805**	.014
Inter-rater	1-2	.616*	.001
	1-3	.754**	.001
	2-3	.697**	.004

significant at the 0.01 level (2 tailed)

\* Correlation is significant at the 0.05 level (2 tailed)

\*\*Correlation is

### **3.4.2. Phase 2: SFL Analysis**

During the analytic inspection of the selected articles, Sub-moves 10.1, 10.2 and 10.4 of each of the selected articles were scrutinized based on Model II to determine the proportions of the 17 GM types used. The Synthetic investigation based on SFL analysis was carried out simultaneously with the analytic approach to spot the emerging facts. The proportion of each article's use of any ideational GM was determined by calculating the frequency of the number of each sub-type of ideational GM over total running words used in the three afore-mentioned Sub-moves.

#### **3.4.2.1. Text Selection Process for GM Analysis of the SFL Approach**

It was initially very difficult to determine which parts of the Introduction and the Discussion sections of the RAs should be analyzed for the GM analysis of the samples since no study probing the types of GM in EAP texts was found in the literature to be adopted as a guide for this phase of the present study. On the one hand, while the researcher was being trained how to detect types of ideational GM, it was discovered that the task is per se a complicated and time-consuming one. It was, therefore, not practical to analyze all the texts of the two Introduction and Discussion sections of the 64 selected articles (32 ISI Iranian and 32 ISI E-A ones which were determined to be the samples of the second phase of the genre analysis of the study) as a considerable number of the Discussion sections of E-A articles consisted of several pages. The only logical and feasible solution appeared to be taking selections from the texts.

The pragmatic essence of the whole study could ultimately help solve the problem of appropriate text selection for this phase of the study. Firstly, of the Introduction and the Discussion sections, the latter was chosen to extract texts from since this section is generally more representative of any writer's rhetorical style compared to the

Introduction section (explained below). Secondly, it was decided to make a functional relationship between the two phases by choosing specific Sub-moves of the Discussion section of the articles. To do so, all the Sub-moves of the Discussion section used by the two groups in the first phase of the study were examined to find out which Sub-moves were most frequently employed by IrISI and E-A articles. As can be observed in Table 4.3, the three Sub-moves 10.1 (Stating a specific outcome), 10.2 (Interpreting the outcome) and 10.4 (Contrasting present and previous outcome) were used more frequently than the other ones by the two groups of the articles. It was also decided to give priority to the first two Sub-moves. Sub-move 10.4 was determined to be considered only for the few articles in which the above-mentioned two Sub-moves were not sufficiently produced. Finally, coherent samples of the three Sub-moves from the Discussion sections of the two sets of the articles were extracted from the 64 articles to be employed for the GM analysis of the SFL phase of the study.

Since the main concern of text selection was controlling the homogeneity of the functions of the information unit(s) among the texts to arrive at utmost homogeneity of lexico-grammatical choices used by the articles, which in turn could lead to tracing more homogeneous ideational GM types, the lengths of the meaningful coherent texts selected from among the two groups of the articles were not exactly the same. The selected texts, therefore, ranged between 170 and 274 words. Due to this diversity of the lengths of the texts, it was decided to compare the GM uses of the articles based on the percentages of each type of GM type used over the total running words of each selection.

#### **3.4.2.2. Reliability and Validity of the Text Selection Method for GM Analysis**

The afore-mentioned three Sub-moves were purposefully selected to enhance the reliability and validity of text analysis procedure. The underlying logical objectives of choosing these Sub-moves for the GM analysis were as follows:

1. Sub-moves 10.1, 10.2, and 10.4 were the three most frequently used Sub-moves of the Discussion section by the two groups of ISI Iranian and E-A articles as shown by the results of the first phase of the study (Table 4.8). As the articles had mostly employed several numbers of these Sub-moves, it became possible to extract independent meaningful texts with adequate number of words to be utilized as the most prototypical samples of the writers' rhetorical styles. As GM employment in the articles can be considered as a construct of rhetorical style, this method could help increase the construct validity of the measurement technique.
2. For any discourse analysis study, functional homogeneity among the texts under investigation is of great significance as similarity of functions among the texts increases the reliability, and the content validity of the texts resulting in a more rigorous research design which can finally enable the findings to be generalized to other articles of the corpus.
3. Writing the Discussion section of a RA, unlike the other three sections, requires using less pre-defined linguistic structures but more idiosyncrasy and characteristic peculiarity of structures, hence more variability among the texts which can help maintain the expected differences among the rhetorical styles of the writers. The advantage of taking this natural variability of styles into account could additionally enhance the reliability/generalizability of the findings as well

as the validity of the construct of GM employment which was expected to be measured in this phase of the study.

### **3.5. Data Analysis**

#### **3.5.1. ESP Move Analysis Phase**

In order to answer the research questions of the first phase of the present study, non-parametric tests have been required to be applied on the data due to the categorical variables of the Moves and the Sub-moves having been counted based on the nominal scale. The three assumptions required for non-parametric techniques (Coakes, Steed, et al, 2009, p.162), including *random sampling, similar shape and variability across distributions*, and *independence (subjects appear in only one group and the groups are not related in any way)*, have been observed in this study.

##### **3.5.1.1. The Tests Employed for the Move Analysis Phase**

Since the research questions of the ESP genre analysis phase of the present study dealt with two different sets of comparisons being firstly, the comparison between the Move analysis of IrISI and IrNISI articles, i.e. the selected articles from Iranian ISI and Iranian non-ISI journals, and secondly, among IrISI, IrNISI, and E-A articles, which are the selected articles from ISI Iranian, non-ISI Iranian, and ISI English/American journals respectively, two distinct sets of statistical tests, each composed of three types of tests, were performed on the data.

The first set being required for the comparisons between IrISI and IrNISI articles are as follows:

1. Twenty *chi-square tests for goodness of fit* each having been applied on a pair of frequency counts concerning each single categorical variable, being a Move or a Sub-

move of the Introduction and the Discussion sections, derived from IrISI and IrNISI articles in order to examine possible differences between the two related frequency counts.

2. Four *Mann-Whitney U Tests* have been performed across four sets of frequency counts, including the overall number of the Moves of the Introduction Section, the Moves of the Discussion Section, the Sub-moves of the Introduction section, and the Sub-moves of the Discussion section, derived from IrISI and IrNISI articles to examine possible differences between the frequencies.

3. Four *Spearman's rank-order correlation tests* have been applied on the four sets of the frequency counts derived from IrISI and IrNISI articles to determine if there are significant relationships between the two Groups with regard to the frequency counts of the Moves of the Introduction section, the Moves of the Discussion section, the Sub-moves of the Introduction section and the Sub-moves of the Discussion section.

The second set of statistical tests needed to be utilized to do the comparisons among IrISI, IrNISI, and E-A articles are as follows:

4. Four *Kruskal-Wallis Tests* have been applied across four sets of frequency counts - including the overall number of the Moves of the Introduction Section, Moves of the Discussion Section, Sub-moves of the Introduction section, and Sub-moves of the Discussion section - derived from IrISI, IrNISI, and E-A articles to examine possible differences among the frequencies .

5. Twenty more *chi-square tests for goodness of fit* each have been applied on any single categorical variable - being a Move or a Sub-move of the Introduction or the Discussion sections - on the three frequency counts derived from IrISI, IrNISI, and E-A articles in order to examine possible differences among the three related frequency counts.

6. Four Spearman's rank-order correlation tests have been applied on the four sets of the frequency counts to determine if there are significant relationships among the three groups of the articles with regard to the frequency counts of the overall Moves of the Introduction section, the Moves of the Discussion section, the Sub-moves of the Introduction section and the Sub-moves of the Discussion section.

### **3.5.1.2. Application of Three Tests as a Type of Triangulation**

For the *analytic* approach to Move analysis, employing three different tests, namely, Chi Square test for goodness of fit, Mann-Whitney U test for the two groups (or Kruskal Wallis test for the three groups), and Spearman's correlation test to determine the possible differences between/among the frequencies can be justified by the fact that although either one of the tests would be inadequate to do the task of a relevant comparison, each can, nevertheless, effectively contribute to the strength of the comparison due to the variety of the functions of the three tests.

As non-parametric tests are believed to be not as rigorous as parametric ones, applying a variety of the former can act as a sort of triangulation which can enhance the rigor of these tests and, consequently, increase the precision of the statistical reasoning and the *reliability* of the methodology. For instance, Chi-Square test for goodness of fit could only allow to determine the probable differences between/among the frequencies related to each Move or Sub-move but was unable to provide evidence for the possible differences between/among the two/three Groups concerning the sets of the frequencies Coakes *et al's* (2009, p.163). This task was performed by Mann-Whitney U Tests (for the comparisons dealing with the two groups) and Kruskal-Wallis Tests (for the comparisons dealing with the three groups).



These comparisons, however, could not demonstrate the similarities/differences unless it could be clarified if any increase/decrease in the frequency of one set would also be observed in the other set(s). Determining these relationships was accomplished through Spearman's rank order correlation test due to the categorical nature of the variables.

### **3.5.2. The SFL Analysis Phase**

However, to do the data analysis related to the analytic part of SFL analysis phase, t-tests, rather than Chi-square tests, were applied on the proportions of types of GM used in the selected Sub-moves 10.1, 10.2, and 10.4 of IrISI and E-A articles. This difference between the statistical analyses of the two phases of the study can be justified by the fact that the data obtained from the second phase were percentages, not frequencies due to the differences in the lengths of the selected texts. This idea has been underlined by Hatch and Lazaraton (1991, p.406) as; "Do not attempt to perform a Chi-square analysis using proportions".

## **3.6. Variables of the Study**

### **3.6.1. Variables Related to Genre/Move Analysis**

The *dependent variables* of the first phase of the study are as follows:

1. The frequency of each Move/Sub-move used in the Introduction Section of medical research articles
2. The frequency of each Move/Sub-move used in the Discussion Section of medical research articles

The *independent variables* related to this phase are:

1. The rhetorical aspect of presenting Moves/Sub-moves in English/American ISI medical articles of the corpus
2. The rhetorical aspect of presenting Moves/Sub-moves in Iranian ISI medical articles of the corpus
3. The rhetorical aspect of presenting Moves/Sub-moves in Iranian non-ISI medical articles of the corpus

### **3.6.2. Variables Related to SFL Analysis**

The *dependent variables* of the second phase of the study are as follows:

1. The proportion of the types of experiential GM of the ideational type in Sub-moves 10.1, 10.2, and 10.4 of the Discussion section
2. The proportion of the types of logical GM of the ideational type in Sub-moves 10.1, 10.2, and 10.4 of the Discussion section

The *independent variables* of this phase are:

1. The rhetorical aspect of using two types of ideational GM in English/American ISI medical articles of the corpus
2. The rhetorical aspect of using two types of ideational GM in Iranian ISI medical articles of the corpus

## **Chapter Four: Results**

#### **4.1. Introduction**

The current genre analysis study strived to compare the discourse of Iranian and E-A medical RAs in two phases based on ESP and SFL, two pragmatically-oriented traditions in applied linguistics with the general purpose of detecting probable linguistic and/or cultural differences between the rhetorical styles of the medical RAs published in Iranian journals as well as those in E-A ones. ESP tradition was adopted through Nwogu's (1997) study in the first phase of the study to help compare the Moves-Sub-moves, i.e., macro-structures/information units, used in the Introduction and the Discussion sections of three groups (each consisting of randomly-selected 32 articles) of Iranian RAs in English published in ISI and non-ISI medical journals with those of ISI E-A ones. In the second phase of the study, following SFL tradition, different forms of the two types of ideational GM, the experiential and the logical, used in Sub-moves 10.1 and 10.2 of the two ISI medical RA groups mentioned above (ISI Iranian and ISI E-A medical RAs) were analyzed and then compared.

As stated in Chapter three, each of the two phases of the present study has been viewed separately from both analytic and synthetic approaches. In this chapter, the results of the analytic approach have been offered in details for each phase whereas those of the synthetic one, due to the qualitative nature of the approach, have briefly been stated following the analytic ones in the chapter but are unfolded and developed more fully in the subsequent chapter.

## **4.2. First Phase: Results of the Analytic Approach to ESP Move Analysis**

The analytic approach of the ESP/Move analysis of the selected articles of this study, being subject to the Research Questions, called for two almost separate statistical analyses, hence required two distinct categories to report the related results. The first category is associated with the results of the comparisons made between Iranian medical RAs registered by ISI (IrISI) and those which have not been registered by this institute (IrNISI) and the other category deals with the results coming from the comparisons made among all the three groups of the articles.

### **4.2.1. The Comparisons Made Between IrISI and IrNISI Articles**

The first set of research questions of the current study; Research Questions 1, 2, and 3 were concerned with the comparisons made between IrISI and IrNISI articles. The results related to each of these research questions are presented here separately.

To answer the first research question, which looks for the difference between IrISI and IrNISI articles regarding the frequency of each individual Move/Sub-move used in the Introduction and the Discussion sections, two sets of chi-square tests for goodness of fit were performed. Table 4.1 illustrates the results of the first set including six tests applied on the *Moves* of the Introduction and the Discussion sections. The table shows that the differences between the frequencies of the two Groups' uses of Move 1, Move 2, and Move 3 of the Introduction section as well as Move 9, Move 10, and Move 11 of the Discussion section are not significantly different because the levels of significance are 1.000, 0.696, 1.000, 0.662, 0.796, and 1.000, respectively ( $p > 0.05$  for all the six tests).

Table 4.1: *Results of Chi-Square Tests for Goodness of Fit for the Moves Used by IrISI and IrNISI*

	Moves, Introduction section			Moves, Discussion section		
Moves	Move 1	Move 2	Move3	Move 9	Move 10	Move 11
IrISI	32	28	32	22	31	21
IrNISI	32	31	32	25	29	21
X <sup>2</sup>	.000	.153	.000	.101	.067	.000
Asymp. Sig.	1.000	.696	1.000	.662	.796	1.000

The other set of Chi-Square tests for goodness of fit were employed to compare the frequencies of each of the two Groups' use of the *Sub-moves* of the Introduction and the Discussion sections by means of performing 14 independent tests, 6 of which have probed the differences between the frequency of each individual Sub-move of the Introduction section used by the two Groups as well as 8 more tests comparing the two Groups' uses of the Sub-moves of the Discussion section. The results presented in Tables 4.2 and 4.3 show that IrISI and IrNISI exploited the individual Sub-moves of the two sections with similar frequencies as the amounts of  $p$  value for all 14 comparisons (0.900, 0.593, 0.317, 0.900 in Table 4.2. for the Sub-moves of the Introduction and 0.516, 0.881, 0.117, 0.789, 0.695, 0.439, 0.857, 0.549 in Table 4.3 for the Sub-moves of the Discussion sections respectively) are larger than 0.05 except for the absence of any Chi Square and significance values for IrNISI regarding Sub-move 3.2 (Table 4.2) as the weight of this Sub-move for IrNISI was zero. Considering the results of the two sets of Chi-Square tests for goodness of fit as attested by Tables 4.1, 4.2, and 4.3, null hypothesis 1 related to the first research question, stating that there is no significant difference between the frequency of each individual Move/Sub-move used in the Introduction and Discussion sections of IrISI and IrNISI articles, is confirmed.

Table 4.2: *Results of Chi-Square Tests for Goodness of Fit for the Sub-moves of the Introduction Section Used by IrISI and IrNISI*

Sub-moves	1.1	1.2	2.1	2.2	3.1	3.2
IrISI	31	7	27	10	31	2
IrNISI	32	8	31	6	32	0
$\chi^2$	.016	.286	.276	1.000	.16	-
Asymp. Sig.	.900	.593	.599	.317	.900	-

Table 4.3: *Results of Chi-Square Tests for Goodness of Fit for the Sub-moves of the Discussion section Used by IrISI and IrNISI*

Sub-moves	10.1	10.2	10.3	10.4	10.5	10.6	11.1	11.2
IrISI	21	23	17	27	12	6	15	11
IrNISI	17	22	9	29	14	9	16	14
$\chi^2$	.421	.022	2.46	.071	.154	.600	.032	.360
Asymp. Sig.	.516	.881	.117	.789	.695	.439	.857	.549

The second research question, seeking the difference between IrISI and IrNISI articles regarding the overall frequency of the Moves/Sub-moves used in each of the two sections of the Introduction and the Discussion, has been explored through four Mann-Whitney U tests. As it has been depicted in Table 4.4, the Chi-Square values for the comparisons made between the two Groups' overall uses of the Moves of the Introduction section, the Moves of the Discussion section, the Sub-moves of the Introduction section, and the Sub-moves of the Discussion section (0.796, 1.000, 0.747, and 0.878 respectively) are not significant ( $p > 0.05$  in all the four tests). Null hypothesis 2 is, therefore, confirmed.

Table 4.4: *Results of Mann-Whitney U Tests for Moves/Sub-moves Used by IrISI and IrNISI*

Moves/Sub-moves	Sig (2-tailed)	Z
Moves, Introduction	.796	-.258
Moves, Discussion	1.000	.000
Sub-moves, Introduction	.747	-.323
Sub-moves, Discussion	.878	-.158

In order to enhance the rigor of this section of statistical analysis, thus further ascertain the similarity between the presentation of information in the two sections of IrISI and IrNISI and, consequently, to answer the third research question, the possibility of the existence of a linear relationship between each pair of the four sets of the frequencies was tested by means of four Spearman's rank order correlation tests. Table 4.5 illustrates very high correlation coefficients between the four pairs of the frequencies collected from the two Groups, namely, the Moves of the Introduction ( $r = 1$ ), the Moves of the Discussion ( $r = 1$ ), the Sub-moves of the Introduction ( $r = 0.941$ ), and the Sub-moves of the Discussion sections ( $r = 0.907$ ). This result rejects Null Hypothesis 3 which leads to confirming the fact that *there is* a significant correlation between the overall frequency of the Moves as well as the Sub-moves used in each of the two sections of the Introduction and the Discussion sections of IrISI and IrNISI articles.



Table 4.5: Results of Spearman rho's correlations for Moves/Sub-moves Used by IrISI and IrNISI

Variables	Correlation	Sig.(2-tailed)
Moves, Intro.	1.000**	._____
Moves, Dis.	1.000**	._____
Sub-moves,	0.941**	.005
Sub-moves,	0.807*	.015

Notes: \*\* Correlation is significant at the 0.01 level (2 tailed)

\* Correlation is significant at the 0.05 level (2 tailed)

#### 4.2.2. Results of the Comparisons Made Among IrISI, IrNISI, and E-A Articles

The second set of research questions, questions 4, 5, and 6 were related to the comparisons made among IrISI, IrNISI, and E-A articles. Three types of tests appropriate for making the comparisons among the sets of data collected from IrISI, IrNISI, and E-A were performed to answer Research Questions 4, 5, and 6. The results related to each of these research questions are presented here.

To seek an answer to Question 4, which examines if there is any difference among the three groups of the articles regarding the frequency of each individual Move/Sub-move used in the Introduction and the Discussion sections, two sets of Chi-Square tests for goodness of fit one of which was applied on the data gathered from each *Move* of the Introduction and the Discussion sections of the three groups and the other set was applied on each *Sub-move* of the same sections. Table 4.6 reveals the results of 6 Chi-Square tests for goodness of fit being performed on the frequencies of the 6 *Moves*. As can be seen in Table 4.5, the results of the six tests show that the levels of significance for *Moves* 1, 2, 3, 9, 10, and 11 are, respectively, 1.000, 0.867, 1.000, 0.446, 0.927, and 0.788 ( $p > 0.05$ ). The differences are, therefore, not significant.

Table 4.6: *Results of Chi-Square Tests for Goodness of Fit for the Moves Used by the Three Groups of the Articles*

Moves	Moves, Introduction			Moves, Discussion		
	Move 1	Move 2	Move 3	Move 9	Move10	Move11
IrISI	32	28	32	22	31	21
IrNISI	32	31	32	25	29	21
E-A	32	32	32	31	32	25
$\chi^2$	.000	.286	.000	1.615	.152	.478
Asymp. Sig.	1.000	.867	1.000	.446	.927	.788

The results of the other set of Chi-Square tests for goodness of fit consisting of 14 tests, having been applied on the frequencies of the *Sub-moves* of the three groups, have been demonstrated in Tables 4.7 and 4.8. As it can be seen in these Tables, except for the significant differences among the groups concerning the frequencies of the three Sub-moves 1.2, 2.2, and 3.2 with Chi-Square values 16.769, 7.600, and 4.455, and significance levels 0.000, 0.022, and 0.035 respectively ( $\rho < 0.05$ ), there were not significant differences among the frequencies obtained from Sub-moves 1.1, 2.1, 3.1, 10.1, 10.2, 10.3, 10.4, 10.5, 10.6, 11.1, and 11.2 with significance levels, respectively, 0.990, 0.792, 0.990, 0.311, 0.383, 0.121, 0.871, 0.240, 0.738, 0.979, and 0.596 ( $\rho > 0.05$ ). The results obtained from Tables 4.6, 4.7, and 4.8 entail Null Hypothesis 4 to be partially rejected due to the significant differences among the frequencies of Sub-moves 1.2, 2.2, and 3.2, but partially confirmed since the differences among the three groups regarding the other Sub-moves used are not significant.

Table 4.7: *Results of Chi-Square Tests for Goodness of Fit for the Sub-moves of the Introduction section Used by the Three Groups of the Articles*

Sub-moves	1.1	1.2	2.1	2.2	3.1	3.2
IrISI	31	7	27	10	31	2
IrNISI	32	8	31	6	32	0
E-A	32	25	32	19	32	9
$\chi^2$	.21	16.769	.467	7.600	0.21	4.455
Asymp. Sig.	.990	.000*	.792	.022*	.990	.035*

Table 4.8: *Results of Chi-Square Tests for Goodness of Fit for the Sub-moves of the Discussion Section Used by the Three Groups of the Articles*

Sub-moves	10.1	10.2	10.3	10.4	10.5	10.6	11.1	11.2
IrISI	21	23	17	27	12	6	15	11
IrNISI	17	22	9	29	14	9	16	14
E-A	27	31	20	31	21	8	16	17
$\chi^2$	2.33	1.92	4.21	.276	2.85	.609	.43	1.28
Asymp. Sig.	.311	.383	.121	.871	.240	.738	.979	.526

The concern made by Research Question 5 – asking the probable differences among the overall frequencies of all the Moves as well as those of all the Sub-moves used by the three groups – was explored by performing four Kruskal-Wallis tests. The results of these tests shown in Table 4.9, with significance levels 0.558, 0.292, 0.392, and 0.319, are taken respectively from the frequencies of all the Moves of the Introduction sections, all the Moves of the Discussion sections, all the Sub-moves of the Introduction section, and all the Sub-moves of the Discussion section used by the Three Groups of the Articles. The results of the four tests, with the  $\rho$  values larger than 0.05, indicate that there is no significant difference among the three Groups of the articles regarding the

overall frequency of the Moves and the Sub-moves used in each of the two sections. The related null-hypothesis is, therefore, confirmed.

Table 4.9: *Results of Kruskal-Wallis Tests for the frequencies of the Moves/Sub-moves Used by the Three Groups of the Articles*

Moves/Sub-moves	Chi-Square	Asymp. Sig (2-tailed)
Moves, Introduction	1.167	.558
Moves, Discussion	2.462	.292
Sub-moves, Introduction	1.871	.392
Sub-moves, Discussion	2.286	.319

After encountering the above-mentioned similarity regarding the deployment of the Moves and the Sub-moves of the Introduction and the Discussion sections across the three groups of the medical RAs, establishing the statistical analysis of finding a linear relationship which is related to Research Question 6, like the one carried out for IrISI and IrNISI, can enable the researcher of this study to see if an increase/decrease in a set of frequency in either of the three groups has caused a comparable increase/decrease in the same set of the other two groups. To attain this objective, four Spearman's rank order correlation tests have been applied each on the three groups' sets of the frequencies collected from the Moves of the Introduction section, the Moves of the Discussion section, the Sub-moves of the Introduction section, and the Sub-moves of the Discussion section. The results of these tests, as illustrated in Tables 4.8 and 4.4, indicate perfect positive correlation coefficients ( $r = 1$ ) between the frequencies of the Moves of the Discussion section used by the three group pairs namely, IrISI-E-A, IrNISI-E-A, as well as IrISI-IrNISI (Table 4.10 which includes the results of Table 4.5 for convenience). No correlation has been reported by SPSS for the Moves of the

Introduction section concerning the two pairs of IrISI – E-A and IrNISI – E-A due to the fact that the three Moves of this section have been employed with the same frequency, i.e. 32, by E-A

Regarding the other frequencies, as can be observed in Table 4.8, either *very high positive* or *high positive* correlation coefficients are seen for the relationships between the frequencies derived from the group pairs. *Very high positive* correlation, on the one hand, are seen for the three relationships, including between IrISI and E-A's uses of the Sub-moves of the Discussion section ( $r = 0.874, \rho = 0.005$ ), between IrNISI and E-A for their uses of the Sub-moves of the Introduction section ( $r = 0.955, \rho = 0.003$ ), as well as between IrISI and IrNISI for their uses of the same Sub-moves ( $r = 0.941, \rho = 0.005$ ). *High positive* correlation, on the other hand, are seen for the last three relationships, namely, between the frequency of the Sub-moves of the Introduction section as employed by IrISI and E-A ( $r = 0.893, \rho = 0.016$ ), between the frequency of the Sub-moves of the Discussion section being used by IrNISI and E-A ( $r = 0.776, \rho = 0.024$ ), and, finally, between the same Sub-moves as used by IrISI and IrNISI articles. These robust significant relationships strongly rejects Null Hypothesis 6 and confirms that *there are* significant correlations among the overall frequencies of the Moves as well as the Sub-moves used in each of the two sections of the Introduction and the Discussion sections of IrISI, IrNISI, and E-A articles.

Table 4.10: *Results of Spearman Rho's Correlations of the Frequencies of Moves/Sub-moves Used in the Introduction and Discussion Sections of the Three Groups of the Articles*

	Moves, Introduction		Moves, Discussion		Sub-M, Introduction		Sub-M, Discussion	
	Correlation	Sig.	Correlation	Sig.	Correlation	Sig.	Correlation	Sig.
IrISI-E-A	-	-	1,000**	-	.893*	.016	.874**	.005
IrNISI-E-A	-	-	1,000**	-	.955**	.003	.776*	.024
IrISI-IrNISI	1,000**	-	1,000**	-	.941**	.005	.807*	.015

Note: \*\* Correlation is significant at the 0.01 level (2 tailed)

\* Correlation is significant at the 0.05 level (2 tailed)

#### 4.3. First Phase: Results of the Synthetic Approach to ESP Move Analysis

The results of the synthetic approach to genre analysis constituted Research Question 7 for the first phase of the study which led to arriving at the following findings concerning the rhetorical styles employed by the writers of the RAs published in Iranian and E-A medical journals. These findings emerged gradually during ESP Move analysis of the Introduction and the Discussion sections of the 96 articles comprising three groups of the articles of the corpus.

It should be noted that while analyzing the articles, one of the factors complicating Move/Sub-move identification was the numerous cases where the Sub-moves, and subsequently the Moves, of one section appeared in other sections both in ISI and non-ISI articles. This point has been discussed in the next section.

##### 4.3.1. Use of Metadiscourse Markers

Move deployment was, however, proved to be only one of the rhetorical aspects of writing medical RAs. Other aspects can also affect the illocutionary force of the ideas.

In the present study, for instance, appropriate, adequate, and skillful use of discourse/metadiscourse markers in the articles was shown to be the most essential factor facilitating the laborious process of Move/Sub-move identification. The function of these markers was proved to be more pronounced in distinguishing between Sub-moves 1.1 and 2.1.

#### **4.3.2. Structural Evolution in the RAs**

If we consider a cut-off frequency of 50% as a potential measure of move stability, as suggested by Nwogu (1997) and re-applied by Li and Ge (2009), Table 4.5 shows that in the three groups, all the Moves of the Introduction and the Discussion sections have been employed by more than 50% of the articles. Therefore, they can all be considered as ‘obligatory’ Moves. This finding has been discussed in the next section.

#### **4.4. Second Phase: Results of the Analytic Approach to SFL Analysis**

In the second phase of the current study, texts selected from Sub-moves 10.1, 10.2, and 10.4 of the Discussion sections of the two groups of the selected articles, namely 32 ISI Iranian (IrISI) and 32 ISI E-A (E-A) articles, were analyzed based on the model (Table 3.5) adapted from Halliday’s (1998) table of types of GM in scientific discourse (Table 2.5). During GM analysis of the articles, the frequencies of each article’s uses of the seventeen types of experiential and logical GM were counted and the percentages of each of the frequencies over total running words of each selected text were calculated. The results of these calculations can be observed in Tables 4.11 and 4.12.

Table 4.11: *Percentages of the Use of Each Type of GM as Used by IrISI (Iranian ISI) Articles in 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 (%)
1	AIM 1	221	0.4	4	0.4	-	-	0.4	-	-	-	2.3	-	0.4	-	-	-	-	1.3	9.5
2	AIM 2	241	-	0.8	-	-	-	0.4	-	-	-	0.8	-	0.4	-	-	-	-	-	2.5
3	AIM 3	209	1.4	4.8	0.9	0.5	-	0.9	-	0.5	-	1.4	-	-	0.5	0.5	-	-	1.9	13.4
4	AIM 4	184	1	5.4	1	0.5	-	0.5	-	-	-	-	-	-	-	-	-	-	1.6	10.3
5	AIM 5	208	2.4	6.2	1.4	-	-	3.4	0.5	0.5	-	1	-	-	0.5	-	-	0.5	5.3	21.6
6	AIM 6	234	0.4	8.1	-	-	-	2.6	-	1.7	-	2.1	-	-	0.8	0.4	0.4	0.8	1.7	19.2
7	AIM 7	193	1	7.2	1	-	-	2	-	1	1.5	2	-	-	-	-	-	0.5	3.1	19.7
8	AIM 8	193	1	14	1	-	-	2	-	-	-	-	0.5	-	-	0.5	-	1.5	5.2	25.9
9	IJPH 1	200	2.5	8	1	-	-	3.5	-	0.5	0.5	1	-	-	-	-	-	-	1	18
10	IJPH 2	232	0.4	7.7	1.3	-	-	2.6	-	-	-	-	-	-	-	-	-	-	0.4	12.5
11	IJPH 3	192	1.6	5.2	-	1	-	-	-	0.5	0.5	0.5	-	-	-	1	1	0.5	1	13
12	IJPH 4	212	1.9	6.6	-	-	-	0.9	-	2.3	1.4	2.8	-	0.5	-	0.5	0.9	0.9	2.3	21.2
13	IJPH 5	170	-	-	7	-	-	-	-	0.6	0.6	1.2	0.6	-	-	-	-	-	1.2	11.2
14	IJPH 6	223	0.4	3.1	0.4	-	-	0.4	-	-	-	0.4	-	-	-	-	-	0.4	1.3	6.7
15	IJPH 7	248	-	3.6	-	-	-	0.4	-	-	0.4	-	-	-	-	-	-	0.4	2.4	7.2
16	IJPH 8	188	-	9	-	1	-	0.5	0.5	1	0.5	0.5	-	-	-	-	-	-	2.1	15.4
17	IRCMJ	204	2.4	6.9	0.5	-	-	2.4	-	0.5	-	1	0.5	-	0.5	-	-	0.5	4.9	20
18	IRCMJ	214	0.9	5.1	1.9	-	-	2.3	-	0.9	-	2.8	0.5	-	-	1.4	-	0.5	4.7	21
19	IRCMJ	240	-	7.9	-	0.4	-	2	-	1.2	-	1.2	0.4	-	0.8	0.8	-	-	3.3	18.3
20	IRCMJ	201	1	5.5	0.5	-	-	1	-	0.5	-	5	-	-	1.5	0.5	-	1	7.5	23.9
21	IRCMJ	224	0.9	11.2	0.4	-	-	3.1	-	-	-	0.4	-	-	0.4	0.9	-	0.4	9.8	27.7
22	IRCMJ	192	-	8.3	2.1	-	-	3.6	-	-	2.1	2.1	-	-	-	-	-	0.5	10.4	29.2
23	IRCMJ	193	-	5.7	-	-	-	2.6	-	-	-	-	-	-	-	0.5	-	-	5.2	14
24	IRCMJ	222	1.8	7.6	-	-	-	0.4	-	0.4	0.9	1.8	0.9	-	-	0.4	-	-	2.7	17.1
25	JRMS	218	1.4	6	0.9	-	-	1.4	-	1.4	2.3	1.4	-	-	0.9	-	0.4	0.4	5.5	22
26	JRMS	223	1.3	8.1	-	-	-	1.3	0.4	0.4	1.3	1.8	-	-	-	-	-	-	4.5	19.3



<b>27</b>	JRMS	239	1.7	5.8	1.2	-	-	1.2	-	1.2	-	2.9	-	-	-	0.4	-	-	1.7	16.3
<b>28</b>	JRMS	228	3.1	6.6	-	-	-	2.2	-	0.9	-	-	-	0.4	-	-	-	-	4.8	18
<b>29</b>	JRMS	213	0.5	13.6	-	0.5	-	1.4	-	0.9	1.4	3.3	0.5	-	-	1.4	-	-	5.2	28.6
<b>30</b>	JRMS	197	1	8.1	-	-	-	3	-	1.5	1	2	-	-	-	-	-	-	1	17.8
<b>31</b>	JRMS	218	1.8	4.6	0.9	-	-	0.4	-	0.4	0.4	1.8	0.4	-	-	-	-	0.4	3.2	14.7
<b>32</b>	JRMS	226	1.3	7.1	0.9	0.4	-	-	-	0.4	-	3.1	-	-	-	0.4	-	0.4	5.3	19.5

Table 4.12: Percentages of the Use of Each Type of GM as Used by E-A (E-A ISI) Articles in the Selected Texts

No.	Article	Text lengt	1	2i	2ii	3	4	5i	5ii	6i	6ii	6iii	7	8	9	10	11	12	13	Total
<b>1</b>	BMJ1	218	-	6.8	0.4	-	0.4	1.8	-	1.4	0.4	0.4	-	-	0.4	-	0.4	0.4	9.2	22.5
<b>2</b>	BMJ2	235	0.4	9.8	0.4	-	0.4	1.7	0.8	1.3	1.3	1.7	-	-	-	-	-	0.4	7.6	25.9
<b>3</b>	BMJ3	203	0.99	5	0.5	-	-	0.5	0.5	0.99	-	0.9	-	-	-	-	-	-	1.5	10.8
<b>4</b>	BMJ4	202	-	5	-	-	-	4	0.5	1	-	-	0.5	1.5	-	-	-	-	4.4	16.8
<b>5</b>	BMJ5	239	0.4	5	-	-	-	2.5	0.8	0.4	1.7	1.2	0.4	-	-	-	-	-	5.4	18
<b>6</b>	BMJ6	219	0.9	4.1	2.7	-	-	1.8	0.4	0.9	0.4	-	0.9	0.9	-	0.4	-	1.4	3.2	18.3
<b>7</b>	BMJ7	210	1.9	6.2	0.8	-	0.8	3.8	-	0.8	0.8	-	-	2.4	0.8	-	0.9	9.8	5.2	23.3
<b>8</b>	BMJ8	222	0.9	4.5	0.4	0.4	-	3.1	0.4	0.4	0.9	0.9	-	1.3	-	0.4	-	1.8	2.2	18
<b>9</b>	NEJM1	209	2.4	11	1.4	-	-	0.9	0.9	0.9	0.9	0.9	0.5	1.4	0.5	-	-	9.5	6.2	28.7
<b>10</b>	NEJM2	233	-	3.9	0.4	-	0.8	3.4	0.4	1.3	-	3.4	1.3	1.3	-	-	0.4	1.3	6.4	24.5
<b>11</b>	NEJM3	242	1.6	8.3	1.6	-	0.4	4.5	-	0.8	0.4	0.8	0.4	0.8	-	-	-	1.2	8.3	29.3
<b>12</b>	NEJM4	246	0.4	7.3	0.8	-	0.8	1.6	1.2	0.4	0.4	1.2	0.4	0.4	-	-	0.4	1.2	4.5	21.1
<b>13</b>	NEJM5	247	1.6	8.1	-	-	-	4	-	1.2	1.2	0.8	-	0.8	0.4	-	0.4	1.2	5.3	25.1
<b>14</b>	NEJM6	217	0.5	6	2.3	-	-	2.8	0.5	1.8	1.4	2.3	-	0.5	0.5	-	-	0.9	2.8	22.1
<b>15</b>	NEJM7	230	0.4	5.6	0.4	0.4	-	2.6	-	0.4	0.4	1.3	0.9	-	0.4	-	-	1.7	3	17.8

16	NEJM8	221	3.6	6.3	1.3	-	-	1.8	-	2.7	1.3	2.7	-	3.6	-	-	-	0.9	5	28.9
17	JAMA1	259	1.5	10.4	0.8	-	-	1.5	-	1.5	0.8	1.1	-	-	-	-	-	1.1	6.6	25.5
18	JAMA2	274	1.4	4.4	-	-	-	1.8	-	-	-	0.7	-	-	0.7	-	-	0.4	6.6	16
19	JAMA3	221	-	6.8	0.4	-	-	0.9	-	3.2	0.9	2.3	0.4	-	-	-	-	1.3	3.2	19.4
20	JAMA4	252	1.6	9.5	0.4	-	-	0.8	-	0.4	0.8	1.6	0.4	0.8	-	-	-	-	11.5	27.8
21	JAMA5	230	-	7.4	3.5	-	-	1.7	0.4	1.3	2.2	2.2	0.8	-	-	-	-	0.4	7.4	27.4
22	JAMA6	232	0.4	5.6	-	0.4	-	0.8	-	0.8	0.4	1.3	-	-	0.4	-	-	-	1.3	11.6
23	JAMA7	213	1.8	8.9	0.5	-	-	3.3	-	0.5	0.5	2.3	-	-	-	0.9	-	0.5	4.7	23.9
24	JAMA8	223	1.3	9.4	0.4	-	-	2.7	-	1.3	1.3	2.2	-	-	-	-	-	-	4.5	23.1
25	JCI1	244	2	9	-	-	0.4	1.2	-	0.4	0.4	1.2	0.4	-	-	-	-	-	5.7	20.9
26	JCI2	242	0.8	7.8	-	-	-	1.2	-	3.3	3.3	2.9	-	0.8	-	-	-	0.4	6.6	27.3
27	JCI3	240	-	9.2	0.8	-	-	2.9	0.4	0.4	1.7	0.8	0.8	-	-	0.8	-	0.4	8.3	26.6
28	JCI4	232	1.7	10.3	-	-	-	2.6	-	-	0.4	3	-	-	0.4	-	-	-	6	24.6
29	JCI5	214	0.9	9.3	0.9	1.4	-	2.3	-	0.5	2.8	1.4	-	-	1.4	-	-	-	8.9	29
30	JCI6	228	0.4	12.3	-	0.9	-	3.1	-	0.4	0.4	6.1	-	-	-	-	-	0.4	6.1	30.2
31	JCI7	232	1.3	8.2	-	0.4	-	2.6	-	0.4	1.7	5.2	-	-	-	-	0.4	-	3.9	24.1
32	JCI8	213	-	4.7	-	-	-	3.3	-	-	1.4	4.2	-	-	-	-	-	-	7	20.6

#### 4.4.1. Examples of the Uses of Ideational GM Types

The following examples can depict how different types of ideational GM were used in the Sub-moves 10.1, 10.2, and 10.4 of the Discussion sections of the selected ISI E-A and Iranian medical RAs.

##### 4.4.1.1. Examples from E-A (E-A) Articles:

a) Recovery did not occur synchronously in the three dimensions of return to work,

2i 12 2ii 2i 2i

interference with function, and pain status (*BMJ* 6, *Sub-move 10.1*).

2i 2ii 2ii 13

b) The durability of viral suppression and the tolerability of longer-term therapy with

1 6i 2i 1 6ii 2ii

raltegravir-based combination regimens continue to be assessed in the ongoing

6iii 2i 13 6ii

BENCHMRK studies (*NEJM* 8, *Sub-move 10.4*).

13 2i

c) We found that some T-ALL patient samples present alterations in PTEN gene

13 13 2i 13

coding sequence, lack PTEN protein expression, and show constitutive activation

5i 3 13 13 2i 6i 2i

of the P13K/Akt pathway (*JCI* 5, *Sub-move 10.1*).

13 13

d) In this study, we found a low incidence of CML patients (5%) expressing more

than one type of mRNA. Co-expression of more than one type of fusion transcript

in a patient could be due to alternative splicing or for rare type, due to existence

of several leukemic cell lines with different BCR-ABL transcript expression (AIM 6,

*Sub-moves 10.1 and 10.2).*

developing countries (*IRCMJ 4, Sub-move 10.2*).

f) ... while a stop in ADH secretion is to be anticipated, the severity of hyponatremia

should mandate appropriate intervention for timely correction of water and electrolyte

imbalance (*JRMS 1, Sub-move 10.1*).

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#### 4.4.2. The Research Questions of the SFL Phase of the Study

To answer the two research questions of the analytic approach of this phase of the study, Research Questions eight and nine, the results of 18 independent-group t-tests performed on the percentages of GM types used by the two groups have been shown in Tables 4.11 and 4.12. One of these tests was supposed to find an answer for Research Question 8, and the other 17 could answer Research Question 9.

Research Question 8 was formed to probe if there is any difference between total percentages of all sub-types of the two experiential and logical GM in the selected texts as used by IrISI and E-A. The results of the t-test performed on the total percentages of different types of ideational GM used by the two IrISI and E-A articles (Table 4.13) showed that the selected ISI E-A articles have employed significantly more percentages of ideational GM in their Sub-moves 10.1, 10.2, and 10.3 compared to the percentages employed by Iranian ISI ones in the same Sub-moves ( $t_{(62)} = 3.987, p = .000$ ).

Table 4.13: *Results of the T-tests Comparing Total Percentages of All Types of Ideational GM Used by IrISI and E-A Articles*

	Mean		Standard Deviation		t	P value
	E-A	IrISI	E-A	IrISI		
Total GMs	22.78	16.77	5.03	6.88	3.987	.000*

Research Question 9 looked for the probable differences between the percentages of each sub-type of experiential and logical GM in the selected texts as used by IrISI and E-A articles. To answer this question, the results of 17 t-tests, performed on the percentages of each sub-type of the experiential and the logical GM (13 and four t-tests respectively) used by the two groups, to compare this aspect of the rhetorical styles of IrISI and E-A articles have separately been demonstrated in Tables 4.14 and 4.15,

respectively. As can be observed in Table 4.14, the percentages of the two groups' uses of experiential GM Sub-types of 1, 2i, 2ii, 3, 6iii, and 11 did not differ significantly ( $p$  values 0.726, 0.387, 0.567, 0.866, 0.427, and 0.913 respectively). In other words, the results show that writers of the articles published in ISI Iranian medical journals have virtually had equal capabilities of using these GM types as the writers of the articles of E-A journals. However, the results of the t-tests (Table 4.14) revealed that E-A (ISI E-A) articles have employed significantly more percentages of the experiential GM sub-types of 5i ( $t_{(62)} = 2.796, p = 0.007$ ), 5ii ( $t_{(62)} = 2.834, p = 0.006$ ), 6i ( $t_{(62)} = 2.096, p = 0.043$ ), 6ii ( $t_{(62)} = 0.666, p = 0.010$ ), 8 ( $t_{(62)} = 3.090, p = 0.003$ ), 12 ( $t_{(62)} = 2.046, p = 0.045$ ), and 13 ( $t_{(62)} = 3.427, p = 0.001$ ) compared with IrISI (ISI Iranian) articles.

Table 4.14: *Results of the T-tests Comparing the Percentages of Experiential Sub-types of GM Used by Ir and E-A Articles*

	Mean		SD		t	P value
	E-A	IrISI	E-A	IrISI		
<b>1</b>	.98	1.05	.86	.85	-.352	.726
<b>2i</b>	7.38	6.84	2.27	2.68	.871	.387
<b>2ii</b>	.66	.55	.85	.61	.575	.567
<b>3</b>	.12	.13	.31	.28	-.169	.866
<b>5i</b>	2.30	1.52	1.07	1.14	2.796	.007*
<b>5ii</b>	.23	.04	.33	.14	2.834	.006*
<b>6i</b>	.98	.60	.83	.59	2.069	0.043*
<b>6ii</b>	.95	.46	.79	.67	.666	.010*
<b>6iii</b>	1.73	1.46	1.50	1.20	.800	.427
<b>8</b>	.52	.53	.83	.14	3.090	.003*
<b>11</b>	.09	.08	.21	.28	.109	.913
<b>12</b>	1.14	.30	2.30	.37	2.046	.045*
<b>13</b>	5.58	3.48	2.33	2.55	3.427	.001*

Variation was also observed in the uses of the logical sub-types of GM by the two groups (Table 4.15). No significant differences were found between the percentages of the two groups' uses of sub-types 7 and 9 of logical GM ( $p$  values 0.129 and 1.00 respectively). Concerning sub-types 4 and 10, however, two opposing results were observed. Writers of ISI E-A articles (E-A) were shown to employ significantly more percentages of GM sub-type 4 than ISI Iranian ones (IrISI) ( $t_{(62)} = 2.743$ ,  $p = 0.008$ ). They, however, used significantly less percentages of GM sub-type 10 compared to Iranian ones ( $t_{(62)} = -2.650$ ,  $p = 0.010$ ).

Table 4.15: *Results of the T-tests Comparing the Percentages of Logical Sub-types of GM Used by G1 and E-A Articles*

GM Type	Mean		SD		T	P value
	E-A	IrISI	E-A	IrISI		
4	.12	.00	.26	.00	2.743	.008*
7	.25	.13	.36	.25	1.538	.129
9	.18	.18	.33	.37	.00	1.00
10	.08	.30	.23	.42	-2.650	.010*

#### 4.5. Second Phase: Results of the Synthetic Approach to SFL Analysis Phase

Like the first phase of the present study, more findings, not directly related to the research questions, emerged during the text analysis and the data analysis of the second phase. During GM analysis of the selected texts, a new type of GM, not having been mentioned in Halliday's (1998) model of types of GM in scientific discourse was discovered. During data analysis procedure of the second phase, on the other hand, a similarity was observed in the rhetorical styles employed in the texts selected from Iranian and E-A medical RAs regarding the ranking pattern of the use of GM types.

#### **4.5.1. The Previously-undefined Ideational Type of GM**

During GM analysis of the SFL phase of the current study, an undefined type GM was discovered which was used in the selected texts of both E-A and Iranian medical RAs. So far, no metaphor in scientific discourse has been reported which changes entity (noun) to other functions. In the type of metaphor identified in the selected texts of medical RAs, entity changes to circumstance (i.e. preposition, prepositional phrase, and adverb). The following examples from Iranian and E-A selected texts can introduce this type of ideational GM.

##### **4.5.1.1. Examples of Incongruent (Metaphorical) Forms of Circumstances**

###### **4.5.1.1.1. From E-A Articles:**

a) Genetic alterations were not found in participants with low birth weight ... (*JAMA* 3)

- *Congruent form*: Participants ... did not have genetic alterations ...

b) These changes in neural activity may reflect the effects of other peripheral ... (*JCI* 4)

- *Congruent form*: Neural activity change ...

c) We interpret the reduction in acetylcholine to this level ... (*JCI* 6)

- *Congruent form*: acetylcholine reduces ...

###### **4.5.1.1.2. From IrISI Articles:**

d) The resistance rate to co-trimoxazole and tetracycline among E. feacalis ... (*IJPH* 4)

- *Congruent form*: E. feacalis resist to co-trimoxazole ...

e) ... calcium intake contribute to variation in BMD.16 (*IRCMJ* 8)

- *Congruent form*: BMD.16 varies. Calcium intake contributes to this ...

f) ... increase in IOP is an essential goal of anesthetic management ... (*JRMS* 5)

- *Congruent form*: IOP increases. It is an essential goal of ...



#### 4.5.2. Similarity in the Ranking Order of the Two Groups' Uses of Experiential GM Types

Using the data from Tables 4.14 and 4.15, new findings emerged out of ranking the Means of the percentages of the two groups' uses of ideational GM types (Table 4.16). The ranking order of the two sets of the Means shows that the articles of the Iranian and E-A journals followed very similar ranking pattern in using ideational GM types. The results of the Pearson correlation test (Table 4.17) confirmed the very high positive relationship between the two sets of the Means ( $r = 0.973$ ,  $p = 0.000$ ).

Table 4.16: *Ranking Order of the Means of the Percentages of Ideational GM Sub-types Used by the Two Groups*

Means ranked	Related GM type	Means ranked	Related GM type
E-A articles		IrISI articles	
7.38	2i	6.84	2i
5.58	13	3.48	13
2.30	5i	1.52	5i
1.73	6iii	1.48	6iii
1.14	12	1.05	1
0.98	1,6i	0.60	6i
0.95	6ii	0.46	6ii
0.66	2ii	0.55	2ii
0.52	8	0.53	8
0.25	7	0.33	5ii
0.23	5ii	0.30	10,12
0.18	9	0.18	9
0.12	3,4	0.13	3,7
0.09	11	0.12	4
0.08	10	0.08	11

Table 4.17: *Results of Pearson correlation for the Means of the GM Types Used by IrISI and E-A Articles*

<b>Correlations</b>		MeanEA	MeanIR
MeanEA	Pearson Correlation	1	.973**
	Sig. (2-tailed)		.000
	N	17	17
MeanIR	Pearson Correlation	.973**	1
	Sig. (2-tailed)	.000	
	N	17	17

\*\*, Correlation is significant at the 0.01 level (2-tailed).

The findings of both the analytic and synthetic phases of the current study have been discussed in Chapter Five.

**Chapter Five:**

**Discussions, Implications and**

**Suggestions for Further Research**

## **Introduction**

The present study attempted to compare/contrast the rhetorical features of medical research articles (RAs) published in Iranian and English/American journals by means of ESP (English for Specific Purposes) Move analysis of the three groups of Iranian ISI, Iranian non-ISI and English/American medical RAs as well as SFL (Systemic Functional Linguistics) analysis of ideational GM types of two groups of Iranian and English/American ISI medical RAs. The two phases of the study have led to two totally different sections for discussing the findings of each of the two phases; the ESP/Move analysis and the SFL analysis of the selected articles. In this chapter, the most significant findings of the ESP phase, including presentation of information types (Moves/Sub-moves), factors affecting comprehension of the articles, and Move evolution will be discussed. Discussion of the second phase consists of use of GM types by the two groups, change of entity to circumstance, and World Englishes and the present study. The conclusion section of this chapter includes the problems affecting journal and article evaluation followed by recommendations to improve this condition. Implications to improve FL teaching are presented and finally, some recommendations for further research are offered.

### **5.1. Discussion Concerning the ESP Phase of the Study**

#### **5.1.1. Presentation of Information Types**

The results of the comparisons made between the rhetorical informational aspects of IrISI and IrNISI account for the similarity existing between the articles published in Iranian ISI and non-ISI medical journals confirming that these two types of articles have been equally able to exploit the Moves and the Sub-moves usually common in the Introduction and Discussion sections of medical RAs.

Lack of significance among the frequencies of the Moves of both the Introduction and the Discussion sections as used by the three Groups of medical RAs, randomly selected from among ISI E-A, ISI Iranian and non-ISI Iranian journals, indicates that as far as the application of the main types of information (Moves) are concerned, the articles published in both Iranian ISI and non-ISI Iranian journals, as compared with those published in the ISI E-A ones, have been similarly successful in providing major types of information. This finding, being compared with that of Atai and Falah's (2004) study, can show that Iranian scholars in medicine have been more successful in using standard native-like types of information/Moves in their Discussion sections compared to their counterparts in applied linguistics.

Regarding the three groups' application of the constituent elements of the Moves, i.e., the Sub-moves, or according to Mahzari and Maftoon (2007), the way the Moves are *realized*, the presence of the same similarity in the Sub-moves of the Discussion section of the articles of the three groups suggests that the articles of both Iranian ISI and non-ISI journals have likewise been capable of presenting similar information as those of the E-A ones in spite of the subjective nature of the Discussion section.

The findings of this study have uncovered that both Iranian ISI and non-ISI medical RAs, despite their overall similar performance to that of E-A ones in the Discussion section, have failed to present adequate types of information in their Introduction sections, i.e. meaningfully fewer uses of Sub-moves 1.2 (i.e., Reference to main research problems), 2.2 (i.e., Reference to limitations of previous research), and 3.2 (i.e., Reference to main research procedure).

The fact that only a small percentage of both Iranian ISI medical RAs (21.2) and non-ISI ones (24.3), compared to ISI E-A ones (78.1), have been able to specify the problem(s) they have raised, argues that a majority of Iranian writers of medical RAs

have not clarified what specific problem(s) they are after. Since any research study actually aims to remove (or at least modify) one (or more) problems, stating these problem(s) is clearly of crucial importance. This ambiguity, otherwise, damages the integrity and the significance of conducting the study hence detrimentally reduces the illocutionary force of the whole discourse. On the other hand, as experienced by the researcher and the raters of the present study, during Move/Sub-move identification, one of the most arduous part of the Move analysis phase was related to searching for Sub-move 1.2 in Iranian articles due to the fact that even the research problems of some of these Iranian articles belonging to the aforementioned percentages have been so implicitly incorporated between the lines that it was not easy to detect them at the first glance, whereas finding the research problem in the majority of E-A articles was easier due to the writers' applications of more appropriate content words and metadiscourse markers. The following two examples, the first one from *The New England Journal of Medicine (NEJM)* and the second one from *Journal of American Medical Association (JAMA)*, have been given to demonstrate how Sub-move 1.2 is being presented in E-A articles (appropriate content words are underlined but discourse markers are italicized):

- 1) *Unfortunately, no pharmacologic therapy has been shown to be effective in improving outcomes in patients with heart failure with a preserved left ventricular ejection fraction [Sub. 1.2].... Although information about neurohormone levels in this syndrome is limited, available data indicate that .... [Sub. 2.1].... Accordingly, we conducted the Irbesartan in Heart Failure with Preserved Ejection Fraction Study .... [Sub.3.1].*
- 2) *However, ... the licensed tetra-valent glycoconjugate vaccine was poorly immunogenic in infants and is *therefore* not licensed for use in children*

younger than 2 years in the United States and Canada. This poor immunogenicity in younger children is in contrast with other licensed glycoconjugate vaccines .... *Therefore, despite* the highest rates of ... no vaccine is licensed.... *Similarly, no vaccine is available* to prevent ...[Sub. 1.2] We report here the results of a randomized controlled multicenter trial ... and immunogenicity of this novel vaccine in infant[Sub. 3.1].

As can be gathered from these samples, due to the general pragmatic nature of Move/Sub-move identification, each Sub-move needed to be recognized with the help of the other neighboring Sub-moves. This was the case for the whole process of Move/Sub-move identification.

More uses of Sub-move 2.2 (Reference to limitations of previous research) by E-A articles indicates that significantly more comments on the previous studies are offered by the articles of ISI E-A journals. This fact probably witnesses the more tendencies of the writers of these articles to find the gap in the related literature perhaps through studying the articles on Systematic Review or Meta-analysis before embarking on their own research study. It is worth mentioning that ISI Iranian medical articles have shown almost two times more attention to the limitations of previous research compared to non-ISI ones (Table 4.7).

The third type of information in the Introduction section which has meaningfully been treated differently by the three groups is 'Reference to main research procedure', i.e. Sub-move 3.2. It was used by more than one fourth of the articles of E-A (28.1 percent) while only 6.2 percent of Iranian ISI articles have dealt with the procedure of their research in the Introduction section. No non-ISI Iranian articles have dealt with this Sub-move in their Introduction sections.

Most studies on Move analysis have treated each research article section as an independent entity and have not taken any account of various possibilities when the influence of the other sections on the organization of an individual section or when a Move (or Moves) of one section appears in another section. This neglect is also apparent in Nwogu's study. There are some exceptions, however, like Berkenkotter and Huckin's study (1995) which related their analysis of the Discussion to the Introduction and Ruiying and Allison (2003) who moved from Results to Conclusions. In the present study, as well, attention has been paid to consider the frequent cases where Sub-moves, based on the necessity felt by the authors, have occurred in sections different from those mentioned in Nwogu's model. For instance, in one of the selected Iranian ISI medical articles, at the beginning of the Discussion section, the following three Sub-moves of the Introduction section were also present:

The treatment of high myopia by PRK remains a challenge [Sub-move 1.1]. The evidence of grater haze formation associated with regression of refractive correction, and the higher accuracy of LASIC in the treatment of high ametropias, discouraged interests in making PRK more predictable, safe and effective for highly myopic corrections [Numerical Reference][Sub-move 2.1].... By collecting data in a systematic fashion and keeping as many variables as possible constant, this study was designed to examine the efficacy and long-term stability of PRK along with 45 seconds ... [Sub-move 3.1].



### 5.1.2. Factors Affecting Comprehension of Medical RAs

As shown in this study, in addition to Move deployment, there are other rhetorical aspects of writing medical RAs which can greatly influence comprehensibility of the discourse, thus the illocutionary force of the ideas. Most importantly, appropriate, adequate, and skillful use of discourse/metadiscourse markers in the articles has been the most essential factor facilitating the process of Move/Sub-move identification. In the medical RAs, the function of these markers are pronounced, for instance, in distinguishing between Sub-moves 1.1 (Reference to established knowledge in the field) and 2.1 (Reference to previous research). This problem is partly worsened by Vancouver Citation System<sup>2</sup> because, compared to APA, this technique, being employed in medical RAs worldwide, is more mechanical and less revealing of the writers' own attitudes. This fact together with lack of metadiscourse markers can cause Iranian writers of the articles not to be able to manifest their intentions of presenting the ideas. This issue sometimes makes it arduous to find out if a particular idea belongs to the introductory background knowledge (1.1) or to the related research (2.1).

The confusion occurs whenever in the Introduction section of some Iranian medical RAs, writers start giving citations from the first sentences up to introducing the research purpose (Sub-move 3.1) without any use of markers to present their intentions and attitudes. The following text is the Introduction section of the selected ISI article in which use of numerical references without any sign of metadiscourse markers has deprived the section of Sub-move 1.1, making the first three sentences look like Sub-

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<sup>2</sup> Taking its name from a meeting in Vancouver BC, Canada, in 1978, the Vancouver Citation System, is a way of writing references in physical sciences through which references are numbered consecutively in order of appearance in the text – they are identified by Arabic numerals in parentheses (1), square brackets [1], superscript<sup>1</sup>, or a combination<sup>[1]</sup>.

move 2.1. Only the last sentence shows the purpose of the study (Sub-move 3.1) by means of the Endophoric Marker (Hyland, 2005, p. 49) ‘This pilot double-center study’ and the verb ‘designed for’:

Poliomyelitis is an acute viral infectious disease spread from person-to-person, primarily via the fecal-oral root [numerical reference (N.R.)]. Poliovirus is a highly contagious human pathogen, which spreads easily via human-to-human contact [N.R.] but cannot naturally infect other species [N.R.].... Cardioembolic strokes represented 14% of the Stroke Data Bank, [N.R.] 20% of the Lausanne Stroke Registry [N.R.], and 25.6% of the German Stroke Data Bank [N.R.]. This pilot double-center study was designed for evaluation of cardioembolic mechanisms in patients with ischemic stroke.

Comparing this finding with those found in other contrastive studies presented in Chapter Two cannot reveal a consistent pattern in Iranian writers’ use of metadiscourse markers in different disciplines. On the one hand, the serious problem of using metadiscourse markers observed in Iranian medical RAs of the present study is in accordance with a part of Marandi’s (2004) findings regarding use of more persona type of metadiscourse markers by native speakers of English compared with non-native Iranian speakers of English in the Introduction and the Discussion sections of the Master’s theses of TEFL, TESL, and Education. However, Iranian writers in Marandi’s (2004) study used certain types of metadiscourse markers equally or even more than native speakers. These disconformities between Marandi’s (2004) findings and those of the current study can be justified by the fact that samples used in the former have been derived from the students (of TEFL, TESL, and education) who have much more proficiency in applying English discourse/metadiscourse markers compared with the samples of

the latter being medical professionals who are supposed to have taken only a few courses in English.

The findings of Mohammadi Khahan's (2006) study, i.e. the similarity across both nationality and section type existing between the performances of English and Persian native speakers in terms of types and frequencies of the hedges and boosters used in their medical and applied linguistics RAs in English, do not agree with the serious problems observed in this study concerning uses of appropriate discourse/metadiscourse markers of Iranian medical RAs in English. This difference is justifiable since taking articles from two different disciplines into account in Mohammadi Khahan's study clearly shows that the proficiency of English scientific discourse has not been controlled in this study.

Other factors in this study which were found to further affect Move/Sub-move identification, thus the illocutionary force of the information, were the *quality of paragraph development*, *the degree of fluency*, and *the amount of errors in form*. As Move/Sub-move recognition deals with understanding the way information has been organized, these three factors can also affect the degree of overall comprehensibility of an article on the part of the reader. It is worthwhile to point out that, as experienced by the researcher and the raters of the present study, during Move identification in Iranian medical RAs, the existence of proper metadiscourse markers was even able to effectively compensate for the flaws in the rhetorical quality of an article regarding the three factors mentioned above. The reverse did not turn out to be true. This means that even robust paragraph development, high degree of fluency, and absence of grammatical errors together could not thoroughly compensate for the damage to comprehensibility caused by lack of metadiscourse markers.

After lack of metadiscourse markers as the first most crucial factor responsible for unintelligibility and ambiguity in grasping the intended information in Iranian articles, problems in paragraph development can be considered as the second factor. It was quite apparent that a considerable number of the writers/editors of Iranian articles were not aware of the rhetorical constraints of paragraph development in English language. This problem might have been caused by the fact that, in Iran, no paragraph development skills are offered as part of the curriculum of either primary or secondary education. This lack of knowledge has caused young Iranian writers to follow a type of almost unorganized manner of writing styles as supported by Katchen's (1982) finding. Therefore, it is usually difficult for Iranian learners of English to understand and apply regulations of English paragraph development thus tend to transform the same unrestricted writing style into their English performances.

### **5.1.3. Move Evolution**

Comparing the findings of the present study with those of Nwogu (1997) and Li and Ge's (2009) studies, it can be inferred that Move 1 (Table 4.5) in Iranian medical RAs as well as that in E-A ones published between 2008 and 2009 in this study, like E-A ones published between 2000 and 2004 in Li and Ge's (2009) study, has changed from 'optional' to 'obligatory'. Move 9 (Table 4.5), however, which was shown to change from 'obligatory' to 'optional' in Li and Ge's study, showed to have remained 'obligatory' in the present study. The increase in the use of Move 1 indicates that both Iranian and E-A Medical RA writers publishing during the past two years, like their E-A counterparts publishing between 2000 and 2004, are inclined "to provide more background knowledge so as to present a clearer picture of the topic of the discourse for the editors [and the readers]" (Li and Ge, 2009, p.97). Regarding Move 9, in this study,

the more tendencies of Iranian and E-A medical scholars to highlight their overall research outcome in the Discussion section compared to those in Li and Ge's study might be due to either chronological evolution or cultural rhetorical differences.

## **5.2. Discussions Concerning the SFL Phase of the Study**

### **5.2.1. Use of GM Types by Iranian and E-A Medical Journals**

Findings of the analytic and synthetic approaches of the current study suggest that although articles published in ISI Iranian journals totally used significantly less proportion of ideational GMs compared to those published in ISI E-A ones, they employed the GM sub-types with a similar pattern of ranking order. This contradictory difference/similarity can be interpreted from two angles: The significantly less proportion of ideational GM types identified in Iranian articles might be due to the less-complex type of English scientific discourse being employed in Iranian articles as the by-product of Iranian non-native writers/editors of medical English. The similarity in the ranking pattern of the GM types could be due to the virtually adequate proficiency in English scientific discourse possessed by the writers/editors of ISI Iranian medical RAs in English. Another rationale for this similarity might be a probable resemblance existing between the use of GM types in English and Persian scientific discourse discussed below with regard to nominalization in the two languages.

The findings presented in Table 4.16 suggest that the first two most frequently used types of ideational GM in both Iranian and E-A medical RAs are two types of nominalization, i.e. 2i and 13, being process to entity (e.g. *transformation*) and entity as modifier (e.g. *engine failure*) respectively. This finding supports Halliday's (1998, 1997, and 2004) stress on nominalization in English scientific discourse confirming that this type of ideational GM is the most ubiquitous type of GM in the discourse of English

medical RAs as well. The abundant use of nominalization in both Iranian and E-A articles without any significant difference between them (Table 4.14) might be due to the cultural similarity between English and Persian scientific discourse in using more nouns/nominalizations compared to other semantic types. This interpretation is in line with Sanaati's (2008) finding that the presence of far more number of nouns compared to adjectives and verbs in Persian scientific discourse is due to the process of GM formation of nominalization. Concerning the fact that in Colombi's (2006) study nominalizing was also found to be the single most powerful resource for creating GM in the academic texts of Spanish language, this feature of scientific discourse could be related to a universal tendency of all human languages to employ nouns/nominalizations so frequently.

Lack of significant difference between the proportions of GM 2i used in the two groups of the articles (Table 4.14) reveals that in the Discussion sections of Iranian articles, processes have adequately and successfully been reconstrued into entities to make the scientific texts more concise and precise. However, the existence of a significant difference between the proportions of GM 13 used in the two groups suggests that Iranian writers/editors have not been capable enough in using nouns as modifiers of nouns.

The similar low positions the use of logical GM types have taken in the ranking patterns of the two groups of the articles (Table 4.16) indicate that the sub-types of logical GM (i.e. 4, 7, 9, and 10) have normally been used sporadically by both Iranian and E-A medical RAs. The unexpected significantly more uses of logical GM type 10 (Table 4.15) by Iranian articles have been caused by more uses of the circumstance 'due to' by these articles. This might have been a special linguistically cultural tendency in

Iranian writers which stems from a similar feature in Persian language leading to a type of *creativity* in English scientific discourse.

Despite the similarity existing between the two groups regarding their nominalization uses, E-A articles were shown (Table 4.14) to use significantly more proportions of incongruent quality forms, namely 5i and 5ii (processes to quality) as well as 6i and 6ii (circumstances to quality), compared to Iranian ones. Unlike nominalizations which appear to be the most indispensable and smooth type of GM used by both native and non-native contexts of medical RAs, the writers/editors of the articles published in Iranian journals were required to possess a higher degree of proficiency in academic English in order to exploit incongruent forms of qualities.

### **5.2.2. Change of Entity into Circumstance**

In the framework of SFL, as proposed by Halliday (e.g. 1993, 1998, 2004) and reinforced by other scholars of the field (e.g. Taverniers, 2004), it is especially noun phrases (entities) which are more likely to be used metaphorically than any other types of expressions. According to Halliday's account of GM types (Table 3.5), the congruent forms of qualities, processes, circumstances, and relators, are usually used incongruently as entities, qualities, and processes. As far as the investigation of the present study regarding GM types in scientific discourse is concerned, neither in Halliday's account nor in the works of other SFL scholars, there has been any instance of mentioning a situation when a congruent form of entity has been metaphorically changed into any other semantic type.

In the current study, however, the frequent use of metaphorical circumstances which by default were entities can be considered as a type of GM probably employed peculiarly in medical discourse (and most probably in the Discussion sections of

medical RAs) which had not been identified before by other SFL scholars. The use of this type of GM can be illustrated by its use in the following examples:

(a) *Incongruent form*: Genetic alterations were not found in participants with low birth weight... (JAMA 3)

(b) *Congruent form*: Participants with low birth weight do not have genetic alterations ...

In clause (a), the incongruent form of the clause, being a Sub-move 10.1, a specific finding of the study has been presented regarding the topic, i.e. *genetic alterations*. As this topic was required to be the point of departure (the theme) of the clause and, simultaneously, the old information; the whole clause needed to be changed into passive voice causing the Subject of the congruent form together with its postmodifier, i.e. *participants with low birth weight*, to be changed metaphorically into a circumstance (adverb). This type of GM might also exist in the discourse of the disciplines other than medicine, but it has not been recognized yet.

### **5.3. World Englishes and the Present Study**

The construct of appropriate and adequate use of ideational GM can be viewed from the idea of *intelligibility* (Kachru, 1995) of the discourse produced by a non-native writer. As experienced by the researcher and the two raters of the present study, the use of fewer proportions of GM types did not affect Move/Sub-move identification of the selected Iranian articles. Thus, it can be inferred that the use of fewer GM types in Iranian articles, as compared to their E-A counterparts, did not hinder their intelligibility. That Iranian articles were found to follow a ranking pattern in employing GMs similar to that employed in E-A articles might have influenced their comprehensibility.



The question of *deviation/creativity* to account for any difference between a native and non-native performance was raised by Kachru (1995) to reiterate that differences existing between a *nativised* form of English in the Outer Circle and the English of the Inner Circle should not be considered as *deviation* but *creativity*. This idea can be criticized through the necessity of the intelligibility of the English used by the non-native of the Outer Circle. Undoubtedly, the same judgment could, thus, be much more complicated for the users of English in the Expanding circle, such as Iranian writers of medical RAs, who are still dependent on British and American varieties for their spoken and written discourses in English due to lack of a *nativised* English. For these writers, a descriptive contrastive rhetoric approach with the aim of finding the linguistic and the underlying cultural differences, both in the macro- and micro-structures, can be meaningful to find the level of intelligibility.

The differences so diagnosed may be categorized as two major types: those which, either linguistic or cultural, still conform to the overall generic organization and structure, hence, comprehensible by the discourse community, and those which do not. Since the purpose of publishing RAs in English is disseminating knowledge to the whole world, the disconformities, which might entail inadequate comprehensibility and fluency, are required to be brought into appropriate consciousness-raising educational activities for the related discourse community of that particular culture of the Expanding Circle.

Contrary to Kachru's (1995) idea, in the production of knowledge, undoubtedly, interaction among disciplinary cultures is essential and it is the function of written communication which acts as the instrument to facilitate the relationship. This mode of communication, however, requires codification which is carried out by means of relevant generic forms of writing. "Genres are intimately linked to a discipline's

methodology, and they package information in ways that conform to a discipline's norms, values, and ideology" (Berkenkotter and Huckin, 1995, p.1). Writers, therefore, must know how to utilize the particular genre they deal with in order to publish, exert influence on their field of study, and finally, be cited by their peers. The writers "must understand the directions in which a field is developing at any given time and possess the rhetorical savvy necessary for positioning their work within it (Berkenkotter and Huckin, 1995, p.3).

#### **5.4. Problems with the Current Status of Journal Selection and Article Evaluation Criteria**

No research finding can claim exhaustiveness and the ultimate solution for a problem. It entails a trigger for more new inquiries and this is, in fact, how human knowledge is going forward and is accumulated and developed bit by bit. It is apparently clear to all those involved in the scholarly activities that the purpose of enquiry in all aspects of human knowledge is contributing to the betterment of human life. However, it seems that the complexity of modern life and technological advances are leading the minds toward the promotional and commercial aspects even in the area of development of human knowledge. The current status of the two inter-related types of evaluations, *journal* and *article evaluation*, already presented in Chapter Two, will be discussed below in order to pinpoint the deficiencies with the criteria exerted which have not transparently been presented by the journals and institutes for journal evaluation/selection.

Those having experienced the attempt of publishing articles in academic journals might have felt that different editors of the same journals have reacted differently to the same article either from the form or the content viewpoints. Since there are not any

unequivocal universal – or at least regional – guidelines being constantly fed by reliable scientific research findings during article evaluation process, it seems that the editors' decisions are taken partly based on the Editorial Board's regulations, and partly based on their own intuitions and personal knowledge. From what Stayanand, the editor-in-chief of *The Lancet* – one of the world's leading medical journals – states (personal communication, Feb. 26, 2008, Appendix 1), it can be understood that the articles of this journal usually undergo the following two steps of drastic changes while being evaluated:

- 1) Prior to acceptance; a rigorous process of peer review causing the paper being re-written two or three times to improve the scientific content, as well as the linguistic and the grammatical aspects,
- 2) After being accepted; the papers are edited for clarity, brevity, and accuracy to ensure consistency and readability.

As the second part of Satyanand's clear-cut statements in her email clearly denies the presence of any linguists (or probably applied linguists) among the editors of the journal, it can be inferred that perhaps, the findings of genre analysis studies of applied linguists are not utilized during the above-mentioned two steps.

Considering the ambiguous criteria Thomson Reuters has announced, explained in Chapter Two, to follow while evaluating journals for coverage (namely, the journal's basic publishing standards – i.e., timeliness of publication, adherence to International Editorial Conventions, and English Language Bibliographic information, its editorial content, the international diversity of its authorship, and the citation data associated with it), the same question is aroused here if the findings of the plethora of studies conducted in ESP genre analysis in general, and move analysis in particular can potentially be beneficial to be taken into account during journal selection process or if the linguists or

applied linguists are recruited to help carry out the process. These questions entice one to think skeptically about the true value which should be granted to the application of genre analysis studies and, simultaneously, persuade those in charge of this area to acknowledge the merits and the versatility of the findings of these studies.

#### **5.4.1. Recommendations for Improving the Process of Journal/Article Evaluation**

The valuable findings of the plethora of studies in the field of applied linguistics conducted based on ESP, SFL, and other genre analysis theories and approaches can potentially be beneficial during different processes of *article evaluation* and *journal selection/evaluation*. These findings could be adopted in the standardization of article inclusion criteria both nationally and internationally. To fulfill this goal as well as making the processes of journal evaluation and article inclusion as objective as possible, the following attempts could be done.

Peer review is the major process of probably all journals' inclusion criteria. As a kind of concealment has sometimes been observed in the processes of some journal or article inclusion criteria which has caused bewilderment and anxiety on the part of the authors, it is not clear yet if the reviewers have common understanding and attitude toward the meaning of 'a suitable article'. It is thus probable that different journals consider different criteria for article selection. Instead of a tendency to hide these standards, journals and indexing systems should be required to reveal the detailed standards of their inclusion. It is suggested, however, that universal criteria be developed, both for the acceptable form and structure of journal RAs as well as the standards of journal inclusion processes by the international indexing systems. The probable areas of differences which might be inevitable due to the variety of generic types among the disciplines can be announced to the related discourse community.

To further objectify article evaluation process, universal/local checklists can be developed based on the findings of the micro- and the macro-structures of each specific discipline. These checklists, maintaining the standards of form and content of the articles of each discipline, should be available for both the authors and the editors. The authors should be required to adapt their articles to those standards and complete the checklists based on their articles. The reviewers can carefully compare those completed checklists with what they actually observe in the articles and complete the reviewer's checklist accordingly. The paper, then, can be accepted if its quality meets the author's self-completed checklist and, in turn, if the result of the whole process of reviewing meets the required standard quality.

ISI or any other organization in charge of journal evaluation should also check if any journal under evaluation applies the universal/local checklist of article evaluation. One of the determinants of the degree of prestige given to a particular journal should be the legitimacy of both the author and the editors' description checklists as well as the percentage of the conformity of each article to its checklists. It is, therefore, fundamental that the final version of each editor-completed checklist be an integral part of each article.

Relevance to the journal's disciplinary topic should be an item of the checklist. The degree of acceptable relevance should be categorized based on *strong relevance*, *fair relevance*, or *weak relevance to the existing topic but strong relevance to another discipline or topic*. Justification should be given for publishing any article having the last type of relevance with the journal title.

The items of the inclusion criteria checklist should include both form and content of the articles. The editorial board should consist of two groups of scholars: The relevance of the content, the soundness of the procedure, and every other disciplinary

aspect of the articles should be judged by the field specialists. On the other hand, the rhetorical aspects, i.e. both macro- and micro-structures, should be scrutinized by capable linguists, applied linguists, or writing professionals and teachers.

#### **5.4.2. Implications for EFL Teaching**

Since consciousness raising can provide profound cognitive learning on the part of any learner, an integral step of medical research article education could be inuring all the stakeholders in medicine with the *deviations* from standard native-like rhetoric Iranian RA writers often commit in scientific/medical writing, by means of displaying actual samples, which can furnish these writers with vivid and convincing materials. Deviations in the rhetoric of Iranian medical RAs are those differences frequently observed in the styles employed in these articles which hinder intelligibility thus impairs the illocutionary force of the propositions. In the current study, the two major macro-structural deviations found in Move/Sub-move employment of Iranian medical RAs were: lack of clear-cut statement of the problem(s) and lack of reference to limitations of previous research. These two shortages have been considered deviations because they can together justify the underlying significance of the study. Another considerable deviation detected in these articles, being related to a micro-structural aspect of rhetoric, is inadequate/inappropriate use of discourse/metadiscourse markers which practically impaired comprehensibility of the information units presented in a considerable number of articles.

Apart from the deviations, in the present study, some other aspects of rhetorical features of medical RAs were found which, although not considered as deviations, are normally used in a standard medical RA. One such finding is different modes of flexibility in the presentation of the required information in the Introduction and the

Discussion sections. In a RA writing classroom, it is crucially important to illustrate the permissible type(s) of flexibility that a creative writer can follow when applying different types of information in medical RA sections, such as using particular Moves/Sub-moves in uncommon sections without causing any impairment to the overall fluency, unity, and coherence of the article. Another type of such feature is the difficulty of utilizing the incongruent quality types of GM, while cannot be considered as deviation due to the alternative use of the congruent forms.

How much we choose to unpack ideational metaphors in our analyses will depend on our purposes. There could be at least two advantages of unpacking experiential and logical metaphors in an educational setting. One is that by paraphrasing highly metaphorical discourse, we can show learners how it means what it does. Curriculum designers can benefit from this feature of scientific discourse to design a curriculum that leads from more spoken to more written modes. On the other hand, recovering participant roles and logical arguments, rendered implicit by ideational metaphor, could establish a powerful tool for critical discourse analysis (Martin & Rose, 2007).

#### **5.4.3. Suggestions for Further Research**

Some relevant areas for further research based on the findings of this study are as follows:

- ❖ The present study has embarked on only the rhetorical features of information structure (Moves) of the Introduction and Discussion sections of Iranian ISI and non-ISI medical RAs as well as the ideational GM types used in these articles. There could be other numerous future studies inspecting other probable rhetorical differences with respect to the Move structures of the Methods and

Results sections of these articles and the types of interpersonal GM types used as well.

- ❖ In order to display a more profound description of Iranian medical RAs, further quantitative/qualitative studies should be conducted to scrutinize their uses of metadiscourse markers, paragraph development, fluency, etc. Such studies can further manifest if the articles published in peer-reviewed international journals are truly more *valuable* than those published in local journals. The term *international journals*, does not mean those journals that Swales (2004, p.1) has ironically criticized as increasingly having the meaning of “...those that accept only articles written in English and are published in Western Europe and North America”, but those articles in English in the journals registered by Thomson Reuters, being published in *the Inner Circle* (L1 varieties, e.g. the USA, the UK, etc.), *the Outer Circle* (ESL varieties, e.g. India, Malaysia, etc.), or *the Expanding Circle* (EFL varieties, e.g. Iran, China, etc.) (Kachru, 1990).
- ❖ To track Move/Sub-move changes in the articles published after 2009 in E-A medical journals, it is recommended another study be done to re-examine these information units employed by the writers of these articles.
- ❖ The ideational GM types used in English scientific discourse can be compared with those used in Persian scientific discourse. The results can show if equal/different types of ideational GMs are used in the same genres of the two languages or whether the two languages follow the same pattern of ranking order of GM types.
- ❖ In various other disciplines, Move/Sub-move as well as GM employments in ISI/non-ISI Iranian journals can be compared/contrasted with those of E-A ones to find out the related linguistic/cultural differences



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صناعتی، م. (1387، 2008). مفهوم سازی در واژه سازی زبان فارسی. رساله دکتری. دانشکده ادبیات و زبان های

خارجی، دانشگاه علامه طباطبائی.

## Appendix 1

From: Satyanand, Tara (ELS-CAM) <Tara.Satyanand@lancet.com>

To: nasrinsayfour@gmail.com

Date: Tue, Feb 26, 2008 at 7:41 AM

Subject: RE: How much change do you make in the articles?

hide details 2/26/08

Dear Nasrin,

As discussed on the phone, here are brief answers to your questions.

1. Do the editors have to change the language of the articles drastically (if needed) in order to make them publishable, or are the writers themselves responsible to do so? This matter is important because I need to analyze the discourse of the articles, published in medical journals, which are written by English and Persian speakers based on two models derived from literature in linguistics.?

**Answer:** All papers published by The Lancet go through a rigorous process of peer review. During this process most authors are asked to rewrite their paper two or three times to improve the scientific content. Reviewers often pick up on language and grammar at this time as well. If accepted, all papers are edited to the same standards for clarity, brevity, and accuracy. We have a book of style, which sets out nomenclature, abbreviations, and grammar rules. Our aim is to ensure consistency and readability. Other than style, we check that the data are accurate, that they accord with the analysis in the text, that information in figures and tables is presented clearly, and that language and grammar are correct and concise.

2. Do the editors make use of the findings of functional grammar and features of scientific discourse in linguistics? If not, what is (are) their criteria for the type of language which should be used in medical discourse?

**Answer:** None of the editors are trained linguists. However, we all have a background in science or medicine, and several of us also have English degrees. Our criteria for language are based on clarity, brevity, accuracy, consistency and readability.

I hope this answers your questions.

Best wishes,

Tara

## **Appendix 2**

### **List of the Articles (96 Samples of the Study)**

#### **1. ISI Iranian Articles**

**AIM1:** Combined fascia and mesh closure of large incisional hernias. Volume 11, Number 3, May 2008.

**AIM2:** Lipid profiles and prevalence of dyslipidemia in schoolchildren in south Khorasan Province, Eastern Iran. Volume 11, Number 6, Nov, 2008.

**AIM3:** Nail molybdenum and zinc contents in populations with low and moderate incidence of esophageal cancer. Volume 11, Number 4, July 2008.

**AIM4:** The prevalence of SEN virus infection in blood donors in Iran. Volume 11, Number 4, July 2008.

**AIM5:** The role of iron deficiency in persistent goiter. Volume 11, Number 2, March 2008.

**AIM6:** Frequency of BCR-ABL fusion transcripts in iranian patients with chronic myeloid leukemia. Volume 11, Number 3, May 2008.

**AIM7:** Cyclosporine in the Treatment of Membranoproliferative Glomerulonephritis. Volume 11, Number 1, January 2008.

**AIM8:** Infection Control practices among dental professionals in Shiraz Dentistry School, Iran. Volume 12, Number 1, January 2009.

**IJPH1:** Quality control of sputum smears examination by re-reading in a tuberculosis screening. Vol 37, No.4, 2008.

**IJPH2:** Prevalence of musculoskeletal disorders and associated lost work days in steel making industry. Vol 37, No.1, 2008.

**IJPH3:** Utility of acid-fast staining in tubercular lymphadenopathy compared to cytopathology. Vol 37, No.3, 2008.

**IJPH4:** High level resistance of *Enterococcus Faecium* and *E. Faecalis* isolates from municipal sewage treatment plants to gentamicin. Vol 37, No.1, 2008.

**IJPH5:** Humoral immune system alterations in silica exposed workers. Vol 37, No.3, 2008.

- IJPH6:** Adhesion of cercaria (larva of helminth parasites) to host by lectins-carbohydrates bonds as a model for evaluation of *schistosoma* entrance mechanisms in cercarial dermatitis. Vol 37, No.2, 2008.
- IJPH7:** Lifetime pattern of substance abuse, parental support, religiosity, and locus of control in adolescent and young male users. Vol 37, No.4, 2008.
- IJPH8:** Use of a MAMA-PCR method to detect GyrA mutations in nalidixic acid-resistant clinical isolates of *escherichia coli*. Vol 37, No.1, 2008.
- IRCMJ1:** The effect of bisphosphate on prevention of glucocorticoid-induced osteoporosis. Vol. 10, No.1, 1-2008.
- IRCMJ2:** Surgical management of combined perforated and bleeding duodenal ulcer. Vol. 10 No.1,1-2008.
- IRCMJ3:** Acid-base disturbances and related factors in patients under general anesthesia. Vol. 11, No.1, 1-2009.
- IRCMJ4:** The frequency rate of cardioembolic etiology in North American and Iranian stroke patients: A pilot double-center study. Vol.10, No.2, 4-2008.
- IRCMJ5:** A 12-Years Surveillance of poliomyelitis and Acute Flaccid paralysis in Fars Province, Southern Iran. Vol. 10, No.4, 10-2008.
- IRCMJ6:** The role of clinical, therapeutic and laboratory findings in monitoring of HCMV infection in bone marrow transplant recipients. Vol. 10, No.3, 7-2008.
- IRCMJ7:** Development of single chain antibodies to p185 tumor antigen. Vol. 10, No.4, 10-2008.
- IRCMJ8:** Prevalence of risk factors of osteoporosis in post-menopausal women in Shiraz, Southern Iran. Vol. 10, No.3, 7-2008.
- JRMS1:** The prevalence and risk factors of the syndrome of inappropriate anti-diuretic hormone secretion (SIADH) following spinal surgery. Vol. 13, No.3, 200.
- JRMS2:** Results of photorefractive keratectomy with mitomycin C for high myopia 4 years. Vol. 13, No.2, 2008.
- JRMS3:** Is microscopic colitis a missed diagnosis in diarrhea-predominant Irritable Bowel Syndrome? Vol. 13, No.4, 2008.
- JRMS3:** Seroprevalence of Human Immunodeficiency Virus (HIV) in pregnant women in Zahedan, Southeastern Iran. Vol. 13, No.4, 2008.



- JRMS5:** Remifentanil-Ketamine versus Fentanyl-Ketamine sedation in patients undergoing phacoemulsification with topical anesthesia: comparison of intraocular pressure changes and sedation quality. Vol. 13, No.2, 2008.
- JRMS6:** Minimum effective dose of Tramadol in the treatment of postanesthetic shivering. Vol 13, No.2, 2008.
- JRMS7:** Mast cells in invasive ductal breast carcinoma. Vol 13, No.5, 2008.
- JRMS8:** Combined anterolateral posterolateral rotary instability: Is posterolateral complex reconstruction necessary? Vol 13, No.1, 2008.

## **2. Non-ISI Iranian Articles**

- MJIRI1:** Prevalence of hepatitis delta virus in various groups with HBV infection in Tehran, Imam Khorameini Hospital (2005-2006). Vol. 22, No.2, August 2008.
- MJIRI2:** Osteotomical allograft reconstruction of the distal radius after giant cell tumor resection. Vol. 22, No.1, May 2008.
- MJIRI3:** Base deficit in the immediate Postoperative period of open-heart surgery and patient outcome. Vol. 21, No.4, February 2008.
- MJIRI4:** Identification of yeast species in the oral cavity of Iranian soldiers by disk diffusion method. Vol. 21, No.4, February 2008.
- MJIRI5:** Cerebral hypercapnia-induced vasomotor reactivity in migraine with and without aura: a case-control study. Vol. 21, No.4, February 2008.
- MJIRI6:** Knowledge and awareness among Iranian women regarding the pap smear. Vol. 22, No.2, August 2008.
- MJIRI7:** Midterm results after surgical correction of total anomalous pulmonary venous connection. Vol. 22, No.2, August 2008.
- MJIRI8:** Excessive testing in emergent evaluation of children with first unprovoked seizure. Vol. 22, No.1, May 2008.
- IJMS1:** Comparison of captopril with enalapril on improvement of systolic and diastolic heart functions in asymptomatic patients over 10 years old with beta thalassemia major. Vol. 33, No.4, Decembr 2008.
- IJMS2:** Peri-operative high-dose v post-operative low dose steroid therapy in the management of biliary atresia: a preliminary report. Vol. 33, No.2, June 2008.

- IJMS3:** Reliability of Persian early computed tomography score in patients with brain infarction. Vol. 33, No.3, September 2008.
- IJMS4:** Relationship between anxiety, depression, and personality type and the incidence of reflex sympathetic dystrophy in patients with distal radius fracture. Vol. 33, No.2, June 2008.
- IJMS5:** Treatment of open tibial fractures: converting or continuing external fixation? Vol. 33, No.1, March 2008.
- IJMS6:** Frequency and distribution of microscopic findings in patients chronic non-bloody diarrhea and normal colonoscopy. Vol. 33, No.2, June 2008.
- IJMS7:** The comparison between the pregnancy outcome after easy embryo transfer and difficult embryo transfer. Vol. 33, No.3, September 2008.
- IJMS8:** Comparison of recurrent or resistant vulvovaginitis caused by non-albicans species of candida. Vol. 33, No.4, December 2008.
- 
- AMI1:** Effects of acoustic stimulation on biophysical profile testing time. Vol 46, No.1, 2008.
- AMI2:** Outcome of prosthetic thigh vascular access graft in hemodialysis patients: A prospective six year study. Vol. 46, No.1, 2008
- AMI3:** complicated parapneumonic effusion: etiology and results of decortication. Vol. 46, No.4, 2008.
- AMI4:** Foreign bodies aspiration in children. Vol. 46, No.2, 2008.
- AMI5:** Iranian diabetics may not be vitamin D deficient more than healthy subjects. Vol. 46, No.4, 2008.
- AMI6:** Pain reducing in icteric neewborns while venipuncturing: comparison of local anesthetic cream with orally glucose. Vol. 46, No.1, 2008.
- AMI7:** The prevalence of occlusion classifications of permanent dentition in Tehrans students aged 12 to 13 years. Vol 46, No.5, 2008.
- AMI8:** Polymorphism in the angiotensin-converting enzyme (ace) gene and ace activity in type 2 diabetic patients. Vol 46, No.4, 2008.
- 
- SEMJ1:** A case control study of acute leukemia risk factors in adults, Shiraz, Iran. Vol. 9, No.1, January 2008.

**SEMJ2:** Evaluation of insulin resistance in severe preeclampsia. Vol 10, No.1, January 2009.

**SEMJ3:** Comparison of universal and risk factor based screening strategies for gestational diabetes mellitus. Vol 9, No.1, January 2008.

**SEMJ4:** Stapled Hemorrhoidopexy, initial experience in Iran. Vol 10, No.1, Jan 2009

**SEMJ5:** Stroke Awareness in Two Rural Counties in Mississippi, USA. Vol. 9, No.2, April 2008.

**SEMJ6:** Value of core needle biopsy as the first diagnostic procedure in the palpable breast masses. Vol. 9, No.4, October 2008.

**SEMJ7:** Evolution of the pH level over time in patients suffering from reflux. Vol 9, No.3, July 2008.

**SEMJ8:** Comparative study of therapeutic effects of honey and povidone iodine in surgical wound healing in rabbit. Vol 9, No.4, October 2008.

### **3. ISI English/American Articles**

**JAMA1:** Trends in opioid prescribing by race/ethnicity for patients seeking care in us emergency departments. January 2, 2008.

**JAMA2:** Immunogenicity of a tetravalent meningococcal glycoconjugate vaccine in Infants: A randomized controlled trial. January 9, 2008.

**JAMA3:** Genetic alterations associated with cryptorchidism. November 19, 2008.

**JAMA4:** Epidermal growth factor gene functional polymorphism and the risk of hepatocellular carcinoma in patients with cirrhosis. January 2, 2008.

**JAMA5:** Low-Dose aspirin for primary prevention of atherosclerotic events in patients with type 2 diabetes. November 12, 2008.

**JAMA6:** Gene variants associated with deep vein thrombosis. March 19, 2008

**JAMA7:** Association of family history with cancer recurrence and survival among patients with stage III colon cancer. June 4, 2008.

**JAMA8:** Genome-wide interrogation of germline genetic variation associated with treatment response in childhood acute lymphoblastic leukemia. January 28, 2009.

**BMJ1:** Cumulative funnel plots for the early detection of interoperator variation: retrospective database analysis of observed versus predicted results of percutaneous coronary intervention. April 26, 2008.

- BMJ2:** Helicobacter pylori test and treat versus proton pump inhibitor in initial management of dyspepsia in primary care: multicentre randomised controlled trial (MRC-CUBE trial). March 22, 2008.
- BMJ3:** Influence of moving to the UK on maternal health behaviours: prospective cohort study. May 10, 2008.
- BMJ4:** Rates of medication errors among depressed and burnt out residents: prospective cohort study. March 1, 2008.
- BMJ5:** Soft drinks, fructose consumption, and the risk of gout in men: prospective cohort study. February 9, 2008.
- BMJ6:** Prognosis in patients with recent onset low back pain in Australian primary care: inception cohort study. July 19, 2008.
- BMJ7:** Elbow extension test to rule out elbow fracture: multicentre, prospective validation and observational study of diagnostic accuracy in adults and children. Jun 3, 2009.
- BMJ8:** Hypersensitivity reactions to human papillomavirus vaccine in Australian schoolgirls: retrospective cohort study. December 1, 2008.
- JCI1:** Chop deletion reduces oxidative stress, improves  $\beta$  cell function, and promotes cell survival in multiple mouse models of diabetes. October 1, 2008.
- JCI2:** Memory T cells established by seasonal human influenza A infection cross-react with avian influenza A (H5N1) in healthy individuals. October 1, 2008.
- JCI3:** HOXA11 is critical for development and maintenance of uterosacral ligaments and deficient in pelvic prolapse. March 3, 2008.
- JCI4:** Leptin reverses weight loss-induced changes in regional neural activity responses to visual food stimuli. July 1, 2008.
- JCI5:** PTEN posttranslational inactivation and hyperactivation of the PI3K/Akt pathway sustain primary T cell leukemia viability. November 3, 2008.
- JCI6:** Maintenance of cardiac energy metabolism by histone deacetylase 3 in mice. November 3, 2008.
- JCI7:** Impaired parasympathetic function increases susceptibility to inflammatory bowel disease in a mouse model of depression. June 2, 2008.
- JCI8:** Kidney injury molecule-1 is a phosphatidylserine receptor that confers a phagocytic phenotype on epithelial cells. May 1, 2008.

- NEJM1:** Noninvasive ventilation in acute cardiogenic pulmonary edema. July 10, 2008.
- NEJM2:** Rapid disuse atrophy of diaphragm fibers in mechanically ventilated humans.  
March 27, 2008.
- NEJM3:** Effect of variation in CHI3L1 on serum YKL-40 level, risk of asthma, and lung function. April 17, 2008.
- NEJM4:** Irbesartan in patients with heart failure and preserved ejection fraction.  
December 4, 2008.
- NEJM5:** K-ras mutations and benefit from Cetuximab in advanced colorectal cancer.  
October 23, 2008.
- NEJM6:** A randomized trial of arthroscopic surgery for osteoarthritis of the knee.  
September 11, 2008.
- NEJM7:** Five-year risk of colorectal neoplasia after negative screening colonoscopy.  
September 18, 2008
- NEJM8:** Raltegravir with optimized background therapy for resistant HIV-1 Infection.  
July 24, 2008

## چکیده

پیشینه پژوهش در حیطه ی تحلیل ژانری مقابله ای نشان می دهد که هنوز ویژگی های نگارشی مقالات پژوهشی پزشکی ایرانی به زبان انگلیسی مورد بررسی و تحلیل قرار نگرفته است. با توجه به مسایلی که دست اندرکاران ایرانی در نگارش بخش های "مقدمه" و "بحث" این گونه مقالات مطرح نموده اند و راه حل های احتمالی که می توان از سبک نگارش مقالات چاپ شده در مجلات معتبر به دست آورد، مطالعه ی حاضر به دو صورت کمی و کیفی در دو مرحله ی تحلیل حرکتی و تحلیل استعاره ی دستوری انجام شده است. در مرحله ی تحلیل حرکتی، دو بخش "مقدمه" و "بحث" از سه دسته 32 تایی مقالات انتخابی از سه گروه مجلات پزشکی: ISI ایرانی، غیر ISI ایرانی، و ISI انگلیسی/آمریکایی بر حسب فراوانی انواع اطلاعات/ حرکت ها ی استفاده شده با استفاده از الگوی انوگو مورد تحلیل قرار گرفت. در مرحله ی تحلیل استعاره ی دستوری این مطالعه، که بر اساس زبان شناسی کنشی نظام مند انجام گرفته است، با استفاده از الگوی هلیدی، انواع استعاره های دستوری اندیشه پردازی به کار رفته در سه حرکت فرعی 10.1 (مطرح کردن یک یافته ی ویژه)، 10.2 (تفسیر یافته)، و 10.4 (مقایسه ی نتایج قبلی با مطالعه ی حاضر) از بخش "بحث" در دو دسته مقالات انتخابی ISI انگلیسی/آمریکایی و ISI ایرانی با یکدیگر مقایسه شدند. نتایج کمی مرحله اول نشان داد که دو گروه مقالات ایرانی از سه حرکت فرعی 1.2 (اشاره به مسایل اصلی پژوهش)، 2.2 (اشاره به محدودیت های پژوهش های قبلی) و 3.2 (اشاره به روش های اصلی پژوهش) از بخش "مقدمه"، به طور معنی داری کمتر از مقالات

خارجی استفاده کرده بودند. نتایج کیفی این مرحله حاکی از استفاده کمتر مقالات ایرانی از کلام نماها و فراکلام نماها

بود. نتایج مرحله دوم گرچه نشان‌دهنده ی استفاده ی کمتر مقالات ایرانی از انواع استعاره های دستوری اندیشه پردازی

بود، اما دو گروه مقالات انواع استعاره ها را با ترتیب مشابهی به کار برده بودند. از یافته های این مطالعه می توان در

فراهم کردن مطالب آموزشی در تدریس نگارش مقالات پژوهشی پزشکی و هم چنین در ارزیابی این گونه مقالات بهره

برد.



دانشکده زبانها و ادبیات خارجی  
گروه آموزشی زبان و ادبیات انگلیسی  
کواهی دفاع از رساله دکتری

هیات داوران رساله دکتری خانم: نسرين صيفوري  
در رشته: زبان انگلیسی گرایش آموزش زبان انگلیسی  
با عنوان:

SFL and ESP Genre Analyses of English Research Articles in Iranian and English-American  
Medical Journals: A Contrastive Study

مقایسه ی نحوه ی نگارش مقالات پزشکی ایرانی به زبان انگلیسی و مقالات پزشکی کشورهای انگلیسی زبان

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تذکر: این برگه پس از تکمیل توسط هیات داوران در نخستین صفحه رساله درج می گردد.





### تعهد نامه اثر

اینجانب نسرین صیفوری متعهد می شوم که مطالب مندرج در این رساله حاصل کار پژوهشی اینجانب است و به دستاورد های پژوهشی دیگران که در این اثر از آنها استفاده شده است، طبق مقررات ارجاع و در فهرست منابع و مأخذ ذکر گردیده است. این رساله قبلاً" برای هیچ مدرک هم سطح یا پایین تر ارایه نشده است. در صورت اثبات تخلف (در هر زمان) مدرک تحصیلی صادر شده توسط دانشگاه از اعتبار ساقط خواهد شد.

کلیه حقوق مادی و معنوی این اثر مربوط به دانشکده زبان ها و ادبیات خارجی دانشگاه تهران می باشد.

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امضا:

تاریخ:



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نگارش

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رساله برای دریافت درجه دکترا در رشته آموزش زبان انگلیسی

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