METADISCOURSE IN DENTISTRY RESEARCH ARTICLES PUBLISHED IN INTERNATIONAL AND IRANIAN JOURNALS

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FACULTY OF LANGUAGES AND LINGUISTICS
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KUALA LUMPUR

2018

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THESIS SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ENGLISH AS A SECOND LANGUAGE

FACULTY OF LANGUAGES AND LINGUISTICS
UNIVERSITY OF MALAYA
KUALA LUMPUR

2018

UNIVERSITY OF MALAYA

ORIGINAL LITERARY WORK DECLARATION

Name of Candidate: Elham Basiratesfahani

Matric No: TGB120028

Name of Degree: Master of English as a Second Language

Title of Project Paper/Research Report/Dissertation/Thesis ("this Work"):

METADISCOURSE IN DENTISTRY RESEARCH ARTICLES PUBLISHED IN INTERNATIONAL AND IRANIAN JOURNALS

Field of Study:

English for Specific Purposes

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ABSTRACT

Writing is a social engaging performance in which the writer is responsible for creating an unfolding and persuasive piece of writing and also for interacting with the reader so as to secure and endorse his authorial credential. Linguistically, there exist several language features that help the writer to come up with a cohesive and reader-friendly text. Among the features are metadiscourse. Metadiscourse highlights how writers control the interactive meaning and at the same time, express their commitments and perspectives. The present study is an attempt to compare the frequency and function of metadiscourse markers in International and Iranian English dentistry articles to distinguish if the Iranian dentistry authors stick to their own native norms, which reflect their cultural identity, or follow the discourse-oriented norms and conventions when they write in English. For this purpose, 20 dentistry research articles (10 from each context) were analyzed following Hyland's (2005a) metadiscourse model. The frequency of occurrence of each marker and its subtypes is calculated per 1000 words due to the unequal size of datasets. Then, the function of each metadiscourse marker is determined. Results indicate that Iranian writers tend to use more interactive metadiscourse markers compared to their International counterparts, while both International and Iranian writers showed a similar trend in the employment of interactional metadiscourse markers. The results of this study provide authentic material to design ESP and writing courses for dentistry writers.

ABSTRAK

Penulisan adalah persembahan menarik sosial di mana penulis adalah bertanggungjawab untuk mewujudkan meruncing dan memujuk sekeping penulisan dan juga untuk berinteraksi dengan pembaca bagi menjamin dan mengesahkan kelayakan beliau authorial. Secara linguistik, wujud beberapa ciri bahasa yang membantu penulis untuk datang dengan sebuah teks yang kukuh dan mesra pembaca. Antara ciri-ciri ini ialah metadiscourse. Metadiscourse menyerlahkan bagaimana penulis mengawal makna interaktif dan pada masa yang sama, menyatakan komitmen dan perspektif mereka. Kajian masa kini merupakan satu usaha untuk membandingkan kekerapan dan fungsi penanda metadiscourse dalam artikel-artikel antarabangsa dan Iran pergigian Inggeris untuk membezakan jika Iran pergigian penulis berpegang kepada norma asli mereka sendiri, yang mencerminkan identiti budaya mereka, atau ikut norma berasaskan wacana dan Konvensyen ketika mereka menulis dalam Bahasa Inggeris. Bagi tujuan ini, artikel penyelidikan pergigian 20 (10 dari konteks setiap) dianalisis mengikuti Hyland dalam metadiscourse (2005) model. Kekerapan kejadian setiap penanda dan jenis virus mereka dikira setiap 1000 perkataan disebabkan oleh saiz lebih datasets. Kemudian, fungsi setiap penanda metadiscourse yang ditentukan. Hasil menunjukkan bahawa penulis Iran adalah lebih cenderung untuk menggunakan penanda metadiscourse interaktif berbanding dengan rakan-rakan mereka Bahasa Inggeris, manakala kedua-dua Bahasa Inggeris dan Iran penulis menunjukkan aliran serupa dalam pekerjaan interactional metadiscourse penanda. Keputusan kajian ini menyediakan bahan yang sahih untuk Reka bentuk ESP dan menulis kursus untuk pergigian penulis.

ACKNOWLEDGEMENTS

This work is dedicated to **Dr. Mohsen Khedri** for all his help and concern in supervising me.

I would like to express my deep gratitude to my first master's thesis supervisor, Dr. Mohsen Khedri, for his great effort in guiding me in this research. I am also grateful to Dr. Daniel Chow Ung T'chiang for guiding me through the last stages of my thesis as my second supervisor.

During this period of study, many friends helped me to accomplish this work and here is my special thanks to my friend Mr. Mackan Mehdigholi, my boss Mrs. Parisa Mojtahed Zade, and my colleagues Mr. Nima Mesalazar and Mrs. Sara Rezaieean for helping whenever needed. I owe special deep heartfelt thanks to Dr. Farhad Nejadi for his positive presense.

And finally, a very special gratitude goes out to my family for being emotionally supportive during the time studying in a foreign country.

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CHAPTER 1: INTRODUCTION

1.1 Background of the Study

Writing is a social engaging act in which the writer is responsible for creating an unfolding and persuasive piece of writing and also for interacting with the reader so as to secure and endorse his authorial credential. As commented by Thompson (2001), any written text is a "record of the dialogue between writer and reader" (p. 58). The writer is required to predict "the audience's likely background knowledge, processing problems and reactions to the text" (Hyland, 1999, p. 5). Linguistically, there are several language features that help the writer to come up with a cohesive and reader-friendly text. Among the features is metadiscourse. In fact, the basis of metadiscourse is the idea that writing is a communicative social act. Metadiscourse highlights how writers control the interactive meaning and at the same time, express their commitments and perspectives. By injecting metadiscourse devices into the writing, writers are able to reform a dry and fuzzy text, which is hard for readers to navigate through it, into a text that appears to be coherent, cohesive and reader-friendly. Thereby, it transforms the personality, credibility, and audience-sensitivity of the text (cf. Hyland, 2000).

This chapter first provides background information about some key concepts in the present research, including discourse community, genre, and research article, which shape the conceptual framework of the study. It is followed by the statement of the problem, research objectives, research questions, and the significance of the study. The section ends with the definition of some key terms.

1.1.1 The Notion of Discourse Community

Lately, researchers have become more interested in investigating the writing conventions in different genres, so the notion of community becomes a fundamental idea in discourse analysis. The focal point of such investigations is the significance of writing

based on the specific goals and conventions of a community that writer wishes to enter. The concept of community is the core of metadiscourse studies, as every communication takes place in social context. It is the concept of community that enables us to identify different cultures and meanwhile, it gives meaning to the genre. According to Hyland (2005a), community and genre produce and are produced by one another. They shape an explanatory and descriptive structure to understand how meaning can develop socially, considering the external forces on a writer when she/he communicates and writes.

The notion of discourse community seems fuzzy, as there are different definitions around it; each determines different boundaries to the term. In 1992 (p. 17), Bizzell claims that she has coined the term in 1982 as "a group of people who share certain language-using practices" (p. 222). However, the concept of discourse community was first coined by Kuhn (1970) as a group of individuals who study and explore the same topic, have experienced similar instruction and shared a paradigm. Likewise, Paltridge (2006) views discourse community as a group of people that have shared goals, values, and beliefs, which leads them to have particular ways of communication.

Swales in his seminal book, *Genre Analysis*, explains discourse community as "socio-rhetorical networks that form in order to work towards sets of common goals" (1990, p.24). He proposes six characteristics to a discourse community. The first one refers to the broadly agreed common public goals. Each discourse community has a series of goals that highlight its norms, beliefs, and values. Goals are public and may be formally explained or be implicit. Second, there are approaches and mechanisms that enable the members to communicate together within the community. Communication mediums or environments of any discourse community are used to convey messages between the members. Third, those mechanisms are used to provide and process information among community members. Discourse communities enjoy any suitable technology or source

that interests their goals and can provide information to achieve those goals. There are different types of communication mechanisms in a discourse community such as meetings and bulletins that are used depending on the goals. Fourth, any discourse community possesses a particular genre and uses it to achieve its public goals. The concept of genre is the framework of a discourse community and determines its borders and rules of communication among the members. Section 1.1.2 will explain the notion of genre in more details. Fifth, experts of threshold levels specify particular conventions that one must consider in order to gain the membership of specific discourse community.

1.1.2 The Notion of Genre

Any discourse community has its own particular approaches to communicate. These particular approaches produce genre. Genres are groups of identifiable texts to both readers and writers, which meet the rhetorical requirements of their context. There are plenty of definitions around the term. Miller (1984, p. 31) defines the genre as "typified rhetorical actions" that respond to recurring situations and become instantiated in the communities' tradition. Martin (1984) views genre as "a staged, goal-oriented, purposeful activity" in which speakers engage as members of a particular culture. However, the most persuasive definition of the genre could be one that is proposed by Swales (1990), as a leading genre analyst in the world. He addresses genre as:

> *A class of communicative events, [whose members] 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 principle shapes the schematic structure of the discourse and influences and constrains choices of content and style. (Swales, 1990, p. 53)*

According to the Swales's (1990) definition, the distinguishing characteristic of the genre is the communicative purpose it achieves. The rhetorical structures of genre reflect the socially identified communicative purposes (Swales, 1990) that enable the expert members of the discourse community "to achieve private intentions" (Bhatia, 1990, p.13). As with Swales (1990), Bex (1996, p. 137) highlights the social aspect of the genre by defining it as "an aggregation of communicative events that fulfill a common social function". By the same token, Bhatia (1993) defines the genre as:

> *A recognizable communicative event characterized by a set of communicative purpose(s) identified and mutually understood by the members of the professional or academic community in which it regularly occurs. Most often it is highly structured and conventionalized with constraints on allowable contributions in terms of their intent, positioning, form, and functional value. These constraints, however, are often exploited by the expert members of the discourse community to achieve private intentions within the framework of socially recognized purpose(s) (p. 13).*

Both Swales (1990) and Bhatia (1993) view genre through a socio-cognitive lens that sees genre as social, dynamic and interactive procedures. Later in 1997, Bazerman develops the idea of genre and explains that it is not just forms but the frameworks of acting socially. Then in 2004, Swales develops his definition of the genre on the basis of Bazerman's (1997) explanation. Swales (2004) points that genres are not social actions but act as frameworks for them. He adds that framework function of genres does not supply all the needs of complete communicative action.

1.1.3 Research Article as an Academic Genre

The concept of genre has given an important structure and framework to study different aspects of writing, including academic writing. Academic genres provide fundamental and basic resources for researchers to investigate the conventions of writing, social practices, and values of a particular discipline and research community (Bondi & Hyland, 2006). Research articles – as a prominent academic genre – historically emerged from the "informative letters" written by scientists with the aim of reporting their new academic findings to each other (Swales, 1990, p. 110). This genre is the most important representatives of new knowledge in today's scientific domain (Hyland, 2000; Salager-Meyer, 2001; Swales, 1990). The important communicative genre of research articles highlights the conventions of writing and norms of any specific discourse community, especially when there is a tough assessment process for them to be published as an accurate and trustable source of information in the academic world (John & Swales, 2002). Jalilifar (2009) explains the research article as "a piece of writing about a particular subject that is published in a scholarly journal or book for an intended audience. It is representative of accumulated knowledge of a field" (p.7). Bruce (2005) states that a research article serves as the proven genre of social communications in the research-based academic discourse communities. According to the above statements, it can be concluded that research articles play a crucial role in creating and distributing academic knowledge, as it is a gateway of introducing uniqueness and importance of the researchers' works to the expertise and members of their discourse community. Since research articles represent the rationales and social beliefs of any different disciplinary community, researchers must be totally familiar with the conventions, rhetorical structures, and goals of their discourse community.

Bearing in mind the importance of research article genre, it has been chosen as the focal genre of the present study and the reason behind this choice is two folded. First, as

Swales (2004) mentioned, although there are plenty of works in the genre of research articles yet it is not a finished job. Moreover, according to Mauranen (1993, p. 158), rhetorical features are a crucial part of a culture and there is no exception for research writing. So, examining a specific corpus of this genre enables us to find cultural proclivities' in linguistic features.

Research articles have been analyzed broadly through a linguistic lens. Some studies investigate the overall structure of research articles while others examined particular features in them. The results of such studies shed light on the boundaries that determined by the expertise of discourse communities to obtain "private intentions within the framework of socially recognized purposes" (Bhatia, 1993, p. 13). Hyland (2005a) states that official approval of new knowledge and ideas in the impersonal and propositional communicative genre of the research article is a social procedure, so the writer must use appropriate linguistic features in writing to gain the acceptance of readers. One of the key parts of linguistic features is metadiscourse, which is responsible for creating a persuasive and reader-friendly text (Hyland, 2005a). By the same token, Crismore and Farnsworth (1990) state that metadiscourse is a crucial feature of a persuasive and argumentative text. It is one of the important characteristics of so many languages and genres that can highlight the rhetorical differences in the texts whose writers are from different cultures (Mauranen, 1993; Crismore, Markkanen & Steffensen, 1993; Valero-Graces, 1996). The notion of metadiscourse will be explained deeply in Chapter Two.

1.2 Statement of the Problem

Research and publication have almost always been one of the mental engagements of academics, especially postgraduate students. They are typically concerned about how persuasively they should create and organize their texts so that they secure their credentials and gain acceptance from experts and gatekeepers within any specific

discourse communities. Regardless of their culture, language, and the disciplinary community, academics are expected to contribute their new findings and knowledge through communicative academic genres, including the research article. However, they suffer from being marginalized and excluded due to article rejection. As opined by Abdollahzade (2011), effective writing needs the writers to equip themselves with the knowledge of community-oriented employment of the proper linguistic features. The writer is required to not only be familiar with the culture of that language s/he writes in but also its lexis and grammar so as to create a text which is up to the standards of the preferred journal. By bearing in mind the prominent part that linguistic features, namely metadiscourse, play to build up a persuasive and unfolding text, the current research hypothesizes that one of the crucial causes of the article rejection phenomenon can refer to the author's lack of familiarity with metadiscursive markers, and also their improper use in the discourse. Research has shown that the appropriate deployment of metadiscourse in texts is an indispensable part of constructing a cohesive and persuasive discourse (cf. Intaraprawat & Steffensen, 1995). When the writer lacks a general understanding of preset rhetorical norms in a particular community, she/he would be unable to logically use textual and interpersonal linguistic features. As a consequence, they would come up with a writer-based discourse in which the ideational meanings are not effectively interpreted, thus lessening the overall quality of the discourse and finally rejection.

Moreover, the literature search shows that plethora of studies have examined metadiscourse deployment in academic writing within several disciplines or small cultures from both the soft and hard ends of the academic continuum (e.g. economics, applied linguistics, psychology, physics, mathematics, environmental/ electrical/ mechanical engineering, computer sciences, biology) and across different languages or big cultures (*English* vs. *Spanish* – Mur-Duenas, 2007, 2011; *English, French,* and

Norwegian – Dahl, 2004; *English* vs. *Chinese* – Hu & Cao, 2011; Kim & Lim, 2013; *English* vs. *Italian* – Molino, 2010).

Still, based on literature investigation, metadiscourse is relatively under-researched in medical rhetoric, especially dentistry domain. The gap seems to be acuter when it comes to cross-linguistic perspective, especially in the less-explored non-western language of Persian and the widely studied language of English as lingua franca. Moreover, most of the metadiscourse cross-cultural studies did not investigate the whole metadiscourse markers or did not explore the whole article for metadiscourse. Among all, Abdollahzade (2011) investigated hedges, emphatics, and attitude markers in conclusion sections of English and Iranian research articles. Kim and Lim (2013) also studied hedges and boosters in abstracts of English and Chinese research articles.

Thus, this study makes an attempt to fill in the gap quo in the metadiscourse literature, shedding some light on the rhetorical differences and similarities in the use of metadiscourse in dentistry research articles (from the introduction to conclusion) written in English by International and Iranian writers.

1.3 Objectives of the Study

Writers use a wide variety of expressions to cohesively convey the information. Some of them indicate the propositional content of the text with the help of lexical and grammatical features such as synonyms, antonyms, and anaphoric pronouns. The second group, which is culture-sensitive and called metadiscourse, does not add anything to the propositional meaning but help the readers to organize and understand the propositional matter (Crismore et al.1993). Metadiscourse markers are complicated devices that serve various functions and are vital to write a cohesive and coherent text, including research articles.

Research article is a communicative academic genre that academics contribute their new findings through it. However, many academics suffer from being excluded due to research article rejection. According to Abdollahzade (2011), an effective writing needs the writers to equip themselves with the knowledge of community-oriented employment of the proper linguistic features including metadiscourse. The familiarity with metadiscourse markers helps the writer to satisfy the needs of his/her readers. According to Crismore (1989), metadiscourse enables writers to announce the forthcoming attractions, changing the topic, making certain or uncertain claims, specifying a remarkable perspective, mentioning the presence of the reader and expressing an attitude toward an event.

Metadiscourse devices are culture- and discipline- sensitive. Previous studies showed that there are some similarities and differences in metadiscourse usage across different cultures (Hu & Cao, 2011; Molino, 2010) and different disciplines (Abdi, 2002; Harwood, 2005; Hyland, 1987, 2007; Khedri et al., 2013ab; Vazquez & Giner, 2009). Regarding the discipline-sensitive characteristic of metadiscourse markers, previous studies (Abdi, 2002; Harwood, 2005; Hyland, 1987, 2007; Khedri et al., 2013ab; Vazquez & Giner, 2009) showed that metadiscourse devices are used differently in hard and soft sciences. These differences are partially due to the different manners of interceding reality in hard and soft disciplines. In other words, these fields deploy different resources in constructing new knowledge. For re-construe experience, Science and engineering writers are focusing mostly on reformulation while humanity writers produce more explicit interpretative texts.

Bearing in mind the importance of metadiscourse and its culture/discipline-dependent nature, the present research studies the metadiscourse used in English dentistry research articles written by International and Iranian writers to see if Iranian authors stick to their

own native norms, which reflect their cultural identity, or follow the discourse-oriented norms and conventions when they write in English. To be specific, the study seeks for the variety of metadiscursive features implemented in dentistry writings within both cultures. Finally, this study puts a step forward and targets at exploring the functions that metadiscourse serves in both International and Iranian datasets.

1.4 Research Questions

In line with the above-mentioned research objectives, the following two research questions form the concern of the present study:

1. What are the similarities and differences between the types and the frequencies of metadiscourse markers used in English dentistry research articles written by International and Iranian writers?
2. What are the functions of metadiscourse markers in English dentistry research articles written by International and Iranian dentistry writers?

1.5 Significance of the Study

The results of this study are expected to deepen our knowledge of metadiscourse in academic writing in general and to provide more insights into the culture-specific nature of metadiscourse in constructing dentistry discourse. As the present research is a contrastive study of metadiscourse occurring in the two different sets of English dentistry journal articles (written by International and Iranian writers), results will help dentistry writers, especially Iranians, to learn more about the part that metadiscourse plays in structuring the discourse and how to effectively present their new findings in local and International discourse communities.

This study has some pedagogically practical implications for EAP/ESP writers, instructors, students and course designers. As Intaraprawat (1988) states, familiarity with

metadiscourse markers is vital for both native and foreign language learners to write a persuasive piece of text. The results of the present study may help the ESP/EAP course designers to design dentistry language courses to equip dentistry writers with the knowledge of using metadiscourse devices in order to write an effective and persuasive piece of text, hence, decrease the risk of article rejection for publications. Such a course may even contains class activities to make the students aware of the effects of metadiscourse use on readers in receiving the indented messages of the writers. When students feel this effect, they become able to compare and contrast their own piece of writing with that of experts in the field through the lens of metadiscourse in order to improve their writing skills.

1.6 Definition of Key Terms

Genre: In English for specific purposes (ESP) and English for academic purposes (EAP), a genre considered as structured communicative texts by which the members of a specific discourse community share their communicative purposes.

Metadiscourse: is a key pragmatic feature that signals how a writer is eager to guide audiences to understand both their intended meaning and attitude towards the text (Hyland, 2005a).

Persian: The Official language of Iran

Iranian: A native of Iran

Iranian Authors: Authors who are natives of Iran

International Authors: Authors of ISI articles regardless of their nationality

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The current chapter explains i) English for specific purposes, ii) the role of metadiscourse in writer-reader interaction; iii) different perspectives of metadiscourse; iv) the definitions, perspectives and theoretical underpinning of metadiscourse presented by the experts in the field; v) different taxonomies suggested by experts in the field (i.e. Vande Kopple, 1985; Crismore et al., 1993; Hyland, 2005a); vi) overview of metadiscourse taxonomies; and vi) past studies on metadiscourse.

2.2 English for Specific Purposes (ESP)

English for specific purpose (ESP) is a division of English language teaching (ELT). John and Dudley-Evans (1991) explain it as "the careful research and design of pedagogical materials and activities for an identifiable group of adult learners within a specific learning context" (p. 298) whose principal features are *need assessment* and *discourse analysis*. According to Brown (1995), discourse analysis is a necessity for determining the needs of any language learning activity. Discourse analysis is focused on microlinguistic features like frequency counts (aspect/tense, mood, information structure, etc.) as well as macrolinguistic aspects such as genre, levels of discourse in rhetorical subsections of texts, and interactions of learners with discourse in different disciplines. Research in ESP takes place within the overlapping realm of learning English for specific purposes and discourse/genre analysis. Section 2.2.1 reviews some ESP studies in the field of dentistry for more illustration.

Metadiscourse is a widely used term in discourse analysis. The current study is focused on variety and function of metadiscursive features implemented in dentistry research articles written by International and Iranian writers.

2.2.1 ESP Studies in Dentistry

In 2017, Rahimi and Farnia investigated a genre analysis of 70 dentistry introductions written by English and Iranian writers. The whole corpus was extracted from the recent publications of leading dentistry journals. They examined and analyzed the corpus following the Swales' (2004) classification of moves in introductions of research articles:

Move 1: Establishing a territory

Step 1: Claiming centrality and/or

Step 2: Making topic generalization(s) and/or

Step 3: Reviewing items of previous research

Move 2: Establishing a niche

Step 1A: counter claiming in the previous research or raising a question about it.

Step 1B: Indicating a gap

Step1C: Question raising

Step 1D: Adding to what is known

Step 2 (optional): Presenting positive justification

Step 3 (optional): Implicit inconsistencies precluding gap

Move 3: Occupying the niche

Step 1 (obligatory): Announcing present research descriptively and/or purposively

Step 2 (optional): Presenting RQs or hypotheses

Step3 (optional): Definitional clarifications

Step 4 (optional): Summarizing methods

Step 5 (PISF): Announcing principal outcomes

Step 6 (PISF): Stating the value of the present research

Step 7 (PISF): Outlining the structure of the paper

Frequency and Chi-square test revealed that Move 1 step 1 "claiming centrality", Move 2 step 1a "counter-claiming" and Move 3.1 "announcing present research descriptively and/or purposively" are the most utilized moves in both English and Iranian datasets. Besides, the results showed that the most used move for opening the introductions in both datasets was Move 1.1 "claiming centrality". Researchers found statistically significant differences regarding the other moves between the two datasets.

Another ESP research in the field of dentistry is the one by Moattarian and Alibabaee in 2008. Moattarian and Alibabaee (2008) compared the syntactic structures in research article titles from three disciplines: applied linguistics, civil engineering, and dentistry. Considering the important influence of title on attracting the readers, the researchers investigated the utilization of different syntactic structures and their rhetorical functions in titles of research articles. To this end, a randomly selected corpus consisting of 420 research articles in the mentioned fields was provided. The entire corpus was selected from the leading journals of the related fields. The titles of journals were analyzed following the Dietz's (1995, as cited in Bush-Launer, 2000) taxonomy for syntactic structure of articles' titles:

1. Title length

2. Title style:
   - Single unit
   - Multiple unite

3. Title components:
   - Nominal

     - Unmodified

     - Pre-modified

- Post-modified

- Pre- and post-modified

- Verbal
- Prepositional
- Adjectival/adverbial

Results revealed that titles in these three disciplines are different regarding the component, length, and style. Researchers counted the tiles' number of words using Microsoft Word. Results revealed that dentistry titles are the shortest titles among the three disciplines. This finding verifies the claim of Swales & Feak (1994) on the discipline-dependent characteristic of the titles' length. Researchers reasoned that: 1- dentistry titles contained more compound words compared to the other two disciplines, 2- the number of multiple unit titles in dentistry articles was less than the other two disciplines, and 3- In contrast to social and hard sciences, titles in medical sciences are not supposed to provide detailed information on the study.

Regarding the style of the titles, results revealed that multiple unite titles were more frequent in applied linguistics compared to dentistry and civil engineering. This result is in concordance with Hartley's (2007) findings that compound titles are more common in arts and humanities.

As for title components, the researchers categorized titles in nominal, verbal, prepositional, adjectival/adverbial (Dietz, 1995). Three-fourth of titles in the corpus were considered as nominal ones, excluding compound titles. Moreover, more than half of these nominal titles were detected as post-modified. A more detailed analysis showed that the most frequent title's style in dentistry articles was unmodified nominal structure.

2.3 Writer-reader Interaction

Writing is a social act (Hyland, 2005a) and any social act consists of an association between the supplier and receiver of the information. In writing, the writer is the supplier

of information and the reader is the receiver, so there is a duty for the writer to set up and keep up a relation with the reader in order to make the text persuasive. Thus, it can be said that any written text is a "record of the dialogue between writer and reader" (Thompson, 2001, p.58). The writer ought to predict "the audience likely background knowledge, processing problems and reactions to the text" (Hyland, 1999, p. 5). Regarding this matter, Thompson (2001) believes that:

> *... proficient writers attempt to second-guess the kind of information that readers might want or expect to find at each point in the unfolding text and proceed by anticipating their questions about, or reactions to, what is written. The text is built up as a series of writer responses to these anticipated reactions. (p. 58)*

The author needs to involve the reader in the text in order to interact with them. To do so, the writer might use certain linguistic features including metadiscourse.

2.3.1 Writer-responsible and Reader-responsible Languages

The typologies of language are generalizations that shed more light on the nature of language. These generalizations are gained through mixing knowledge about languages. One of these language typologies is the "Reader versus Writer Responsibility" proposed by Hinds (1987). In contrast to some typologies that are on the basis of linguistic factors such as word order, "reader versus writer responsibility" typology points out the cross-cultural differences in the writer and reader task. According to Hinds (1987), in a reader-responsible language the heavy duty of understanding the text is placed on the reader. To put it another way, the reader is responsible to comprehend the written text without receiving the writer's assistance, so readers should be equipped with the high degree of shared contextual knowledge.

On the other hand, in a writer-responsible language the author bears a very heavy duty since assuming the shared knowledge is restricted. In other words, writer supposes the readers with the minimum background knowledge of the topic and writing convention. As a result, the writer assists the reader in a maximum level that may include comprehensible explanation of complex propositions, explicit organization of the text, and use of metadiscourse.

2.4 Metadiscourse: Definitions, Perspectives and Theoretical Underpinning

Discourse – as a stretch of language - is either in written or spoken form. The forms of discourse can be classified in terms of their similarities or differences. These classifications are called genre and are categorized in different groups such as academic, professional or individual genres. For these classifications to be systematic, there is a need to define key rhetorical features and structures for each genre. Metadiscourse is one of the rhetorical features of the genre and an important dimension of genre analysis. It is responsible for the persuasive aspect of the writing and shows the aim of the writer, writers' evaluation of readers, and what interactions he/she created with readers.

There are a number of definitions surrounding the notion of metadiscourse. The definition of metadiscourse is based on three (3) key principles, which provide different perspectives for explaining the term: 1) propositional meaning, 2) the levels of meaning, and 3) functional analysis (Hyland, 2005a).

2.4.1 Metadiscourse and Propositional Meaning

Some scholars believe that metadiscourse is something separate from propositional meaning. We can see such a point of view in definitions of Lautamatti (1978), Meyer (1975), Williams (1981), Vande Kopple (1985) and Crismore (1983). They all mention that metadiscourse is something separate from the topically related materials in the text. The proposition is a vague term but usually defined as "information about external

reality" (Hyland, 2005a, p. 19). Halliday (1994) explains propositional material as information, but this is an arguable explanation for the concept. It can be mentioned that the tendency to separate metadiscourse from propositional meaning roots in 2 points: the first one is the transactional-interactional division of language. The second point is that some earlier scholars separate discourse into 2 parts: primary and secondary. They consider the propositional materials as the primary discourse, and metadiscourse, which supports the primary discourse, as the secondary discourse. But, as some statements may be double-function, the meaning of propositional material seems to remain vague and makes it difficult to identify the metadiscourse.

2.4.2 Metadiscourse and Level of Meaning

Regarding the levels of meaning, some scholars even tend to define a clearer border between propositional discourse and metadiscourse. Williams (1981) and Dillon (1981) believe that there are two levels of meaning in a text. The first level provides information about the topic and the second level attracts the reader's attention to the act of writing. Vande Kopple (2002) also defines two levels of meaning for a text. For him, one level develops the ideational material and the other level, namely metadiscourse, is responsible for helping the readers to evaluate and understand the content. But Hyland and Tse (2004) argue that it is not easy to understand how metadiscourse can make a diverse level of meaning. They explain that although it is possible to separate the propositional material from the method they represent, but it is impossible to omit metadiscourse from the text and claim that the meaning will not change; because the meaning of the text is a package resulted from an interactive links between the writer and reader; and contains propositional materials and expressions that the writer conveys to the reader. So, according to Hyland (2005a), metadiscourse is not a separate plane of meaning because propositional and metadiscoursal materials work together in making a text meaningful.

2.4.3 Metadiscourse and Functional Analysis

The third principle in metadiscourse definitions is functional analysis. There is some confusion in choosing between functional or syntactic approaches for classification of metadiscourse. Most of the scholars believe in functional approach (e.g. Lautamatti, 1978; Meyer, 1975; Williams, 1981), while some other adopt both approaches (e.g. Crismore et al, 1993). Functional – in metadiscourse – means the way of language use to achieve communicative purposes; hence, it identifies whether the stretch of language is a claim, a guide for readers to an activity, a question or so on. The emphasis of functional analysis is on the meaning of language features in the context since functionalists believe that the context of language use may change the function of language items. Thus, according to Hyland (2005a), to identify metadiscourse the question is "what is the function of this item in this particular part of the text?" (p.24). What we considered as metadiscourse is totally dependent on the other parts of the text. So, an item might be metadiscourse in one rhetorical context but the propositional material in another. So, it can be concluded that metadiscourse is a rhetorical and pragmatic phenomenon.

Functional approach of metadiscourse analysis is on the basis of Hallidayian systemic functional theory of language. In his theory, Halliday (1973) defines three metafunctions for language: ideational, interpersonal and textual. The ideational function refers to the use of language to express ideas and experiences. This function is similar to propositional content. The interpersonal function refers to language use for encoding interactions and allows us to interact with others. The textual function refers to how language is used to organize the text and make it coherent. Halliday pinpoints that these three functions are represented together in every utterance and are not separate and independent. For a text to be considered meaningful, there is a need for all these three functions to be integrated. Many scholars use Halliday's metafunctions to classify metadiscourse markers (e.g.

Crismore et al, 1993; Vande Kopple, 1985). Through the SFL lens, metadiscourse is distinguished from propositional matter and is categorized as textual and interpersonal.

2.5 Taxonomies of Metadiscourse

The term metadiscourse was first introduced by Zelling Harris in 1959 to offer a method for "understanding language in use, representing the writer or speaker's attempt to guide a receiver's perception of a text" (Hyland, 2005a, p. 3). Later, other scholars elaborate the notion of metadiscourse with the theoretical support of Holliday's Systemic Functional Linguistics (SFL). All the SFL based metadiscourse definitions completely or partially cover the similar area as metadiscourse but consider it with different names. For example, Meyer (1975) explains it as "signaling" and Enkvist (1978) calls it "metatext". Lautamatti (1978) refers to metadiscourse as a "non-topical material" that is not related to the development of discourse topic but is necessary for understanding the discourse. Keller (1979) points to the term as "gambits" and Schiffrin (1980) uses "metatalk". Then the term attracts some attention and in 1981, Williams explains it as "writing about writing, whatever does not refer to the subject matter being addressed" (p. 212). In 1983, Crismore points to it as:

> *The author's intrusion into the discourse, either explicitly on non-explicitly, to direct rather than inform, showing readers how to understand what is said and meant in the primary discourse and how to 'take' the author". (p. 2)*

In 1985, Vande Kopple presents a new definition of the term on the basis of Lautamatti (1978) and Williams' (1981) taxonomy. He defines the term as "the linguistic material, which does not add to propositional information but signals the presence of an author" (p. 83). Vande Kopple categorizes metadiscourse into two main groups: textual and interpersonal. He defines the textual metadiscourse as features that "help us to show

how we link and relate individual propositions so that they form a cohesive and coherent text" (1985, p. 87). Text connectives, code glosses, validity markers, and narratives are subcategories of textual metadiscourse. Interpersonal metadiscourse for Vande Kopple are those features that "enable us to express our personalities and our reactions to the propositional content of our texts and characterize the interaction we would like to have with our readers about the content" (1985, p. 87). Illocution markers, attitude markers, and commentaries are subcategories of interpersonal metadiscourse. Although many scholars (e.g. Crismore and Farnsworth, 1989,1990; Intaraprawat and Steffensen, 1995; Cheng and Steffensen, 1996) have used this classification, the categorization was still vague and hard to use, because according to Hyland (2005a) there is not a clear distinction between "illocution markers" and " validity markers". Thus, in 1993, Crismore, Markkanen, and Steffensen attempted to enhance Vande Kopple's (1985) taxonomy. Crismore et al. (1993) define metadiscourse as:

> *The linguistic material in the text, written or spoken, which does not add anything to the propositional content but that is intended to help the listener or reader organize, interpret and evaluate the information. (p. 40)*

Crismore et al. (1993) use the same main categories as Vande Kopple (1985) – i.e. textual and interpersonal - but changes the subcategories. He categorizes the first main category - textual metadiscourse - as textual markers and interpretive markers. Textual metadiscourse is categorized as logical connectives, sequences, reminders, and topicalizers. Interpretive markers are categorized as code glosses, illocution markers, and announcements. The second main category – interpersonal metadiscourse is classified as hedges, certainty markers, attributors, attitude markers and commentary. However, this more developed classification also did not make the term clearer or easier to apply.

As mentioned before, metadiscourse is defined on the basis of the social perspective of the writing and so, the writer should be careful of having interaction with the reader in the overall text. Most of the above-mentioned classifications have not considered the social aspect of writing and they divide metadiscourse into two categories - textual and interpersonal. If we agree with the social aspect of writing, then we should accept that all metadiscourse is interpersonal as the writer uses metadiscourse to interact with the readers by considering the needs, capacity and their knowledge. On the basis of this theoretical view, Hyland (2004, 2005a) and Hyland and Tse (2004) introduced a new and more robust model of metadiscourse to resolve the current problems.

This study uses Hyland's (2005a) metadiscourse model as the framework for analysis. In the following sections, metadiscourse taxonomies of Vande Kopple (1985), Crismore et al. (1993) and Hyland (2005a) are described in details as the leading taxonomies of metadiscourse.

2.5.1 Vande Kopple's (1985) Taxonomy

On the basis of Williams's definition of metadiscourse, Vande Kopple (1985) defines the term as "discourse about discourse" or "communication about communication" (p. 83). He believes that a text is created on two levels: discourse and metadiscourse. In the first level, the writer expands the propositional content, which is the information about the subject matter. This level is called discourse. In the second level, the writer just tries to guide the readers through the text and help them to organize, clarify and assess the propositional meaning. This level is known as metadiscourse.

Vande Kopple (1985) develops the metadiscourse model of Lautamatti (1978) and Williams (1981) and presents a new model of metadiscourse with two main categorizations, namely, textual and interpersonal metadiscourse. For Vande Kopple (1985), Textual metadiscourse devices, sometimes called metatext (Bunton, 1999), are

those features that let us uncover the process of forming a coherent and cohesive text through relating discrete propositions. In other words, they organize the text and guide the reader through the text. Interpersonal metadiscourse markers are those items that through them, the writer signals his/her personal views and reactions toward the propositional matter and controls his/her interaction with the reader.

He divides each main category into some specific subcategories. Textual metadiscourse is categorized as *text connectives, code glosses, illocutionary markers, and narrators* while interpersonal metadiscourse is classified as *validity markers, attitude markers,* and *commentary.*

2.5.1.1 Textual Metadiscourse

Text connectives are the first subcategory of textual metadiscourse. The writer uses text connectives to show the relationships between different parts of the text and direct readers through the organization of the text. There are four different types of text connectives. *Sequencers* are the first type, which displays the sequences of discourse organization and exemplified by *next, in the second place, third and first. Logical/temporal connectors* are the next kind of text connectives, which are the markers of logical/temporal relations between ideas. Some examples of logical connectors are *thus, however, and nevertheless. Reminders* are the other type of text connectives, which remind the readers what the writer has commented in earlier parts of the text. Some examples of reminders are *as I noted in chapter 2, as I said earlier and as I mentioned before.* The other type is *Announcements,* which is opposite to reminders, lets the reader know about what the writer will present in next parts of the text. Phrases like *as we will read in the next chapter*, and *as I will explain in next section* carry the role of announcing. *Topicalizers* are the Last type allocated to text connectives. These linguistic features help

the writers to relate new ideas to previous ones. *There is/are, as for*, and *in regard to* are examples of topicalizers (Vande Kopple, 1985, p. 83).

Code glosses are the second subcategory allotted to the textual metadiscourse and help readers to better understand and grasp the ideational meaning. Vande Kopple (1985) notes that the writer uses code glosses to explain a word or a phrase in the text and this task is sometimes done with the help of parentheses. He states that words used to explain does not develop the propositional content but instead, help the audience to understand it. Vande Kopple (1985) fails to clearly exemplify the notion and function of code glosses in his 1985 work, and in 2002, he presents some examples of this category such as *I'll put it this way, strictly speaking*, and *what I meant to say is* (refer to Vande Kopple, 2002, p. 96).

Illocutionary markers are the next subcategory of textual metadiscourse and specify the discourse acts of the writer at specific levels of the text (Vande Kopple, 1985, p. 84). They enable the writer to enter speech acts such as hypothesizing, summarizing, asserting and exemplifying into the text. Some samples of this subcategory are *to summarize, I claim that*, and *for example*. It should be noted that some of the illocutionary markers sometimes perform other functions. Vande Kopple (1985) exemplifies that *I hypothesize* fulfills the two tasks of illocutionary marker and validity marker. Validity markers are one of the subcategorizations of interpersonal metadiscourse and will be discussed in later paragraphs. This multifunctionality of some words comes from the Hallidayian (1973) language metafunctions. As noted earlier in this chapter, Halliday (1973) defines three metafunctions to language, called ideational, textual and interpersonal. On the basis of this categorization, Vande Kopple (1985) explains that sometimes functions of some words may overlap because it is true that writers try to provide organized information and communicate with readers, but at the same time, they are responsible for producing a

coherent and cohesive text. Hence, grammatical and lexical items may fulfill several tasks in the text (p. 85).

Narrators are the last subcategory allocated to textual metadiscourse. They show the source of information in the text to the readers. Some examples of this category are as *according to James, Mrs. Wilson announced that* and *the principle reported that* (Vande Kopple, 1985, p. 84)

2.5.1.2 Interpersonal Metadiscourse

The second main category of metadiscourse in Vande Kopple's (1985) model is interpersonal metadiscourse, which is presented through its specific markers. *Validity markers* are the first markers of interpersonal metadiscourse; through which the writer becomes able to assess the value of information and decide on the degree of commitment to them. There are several different types of validity markers. Hedges, the first type of validity markers, are responsible for indicating the doubts in ideational matters. *Perhaps, may, might, seem* and *to a certain extent* (Vande Kopple, 1985, p. 84) are examples of hedging.

The second type of validity markers – *emphatics* – is applied to highlight the information that the writer trusts. Words such as *clearly, undoubtedly* and *it is obvious that* (Vande Kopple, 1985, p. 84) are some examples of emphatics. Lastly, there are *attributers* which are used by writers to "lead readers to judge or respect the truth" of the information (Vande Kopple, 1985, p. 84).

Attitude markers are the second subcategory of interpersonal metadiscourse that enable the writers to express their emotions and viewpoints towards a proposition (Vande Kopple, 1985, p. 85). *Commentaries* are the last subcategory of interpersonal metadiscourse. They give the writer the opportunity to create a close correlation with

readers and to engage them in an implicit dialogue. Clauses such as *most of you will oppose the idea that, you might wish to read the last chapter first, you will probably find the following material difficult at first* and *my friends* are instances of commentaries (Vande Kopple, 1985, p. 85). Table 2.1 presents Vande Kopple's (1985) metadiscourse classification system

Table 2.1: Vande Kopple's (1985) Classification System for Metadiscourse

Textual Metadiscourse
1. Text Connectives: help readers recognize the organization of the text and functional and semantic relations between it's different parts
2. Code glosses: help readers understand and interpret the meaning of words and phrases (e.g., *X means Y*)
3. Illocution markers: make explicit what speech act is being performed at certain points in texts (e.g. to sum up, to give an example)
1. **Narrators:** let readers know who said or wrote something (e.g., *according to X*)
Interpersonal metadiscourse
1. Validity markers: assess the truth-value of propositional content and represent the degree of writer's commitment to the assessment, hedges (i.e. *might, perhaps*), emphatics (i.e. *clearly, obviously*), attributors (i.e. *according to X*), which are used to guide readers to judge or respect the truth-value of the propositional content as the author wishes
2. Attitude markers: are used to reveal the writer's attitude toward the propositional content (i.e. *surprisingly, it is fortunate that*)
3. Commentaries: draw readers into an implicit dialogue with the author (i.e. *you may not agree that, dear reader, you might wish to read the last section first*)

2.5.2 Crismore et al.'s (1993) Taxonomy

Crismore et al. (1993) investigate the notion of metadiscourse from two different aspects, namely, culture and gender. They changed the subcategories of Vande Kopple's (1985) metadiscourse – but not the main categories - and present a new classification of

metadiscourse called "A Revised Classification System for Metadiscourse Categories". In this new model, textual metadiscourse are those markers used for "logical and ethical appeals" while interpersonal metadiscourse is responsible for "emotional and ethical appeals" (Crismore et al., 1993, p. 47).

Crismore et al. (1993) recommend the revised model of metadiscourse on the basis of Vande Kopple's (1985) metadiscourse model and there are some similarities and differences between them. To be brief, the focus here is just on contrasting the two. As noted, Crismore et al. modified the subcategories of Vande Kopple's metadiscourse model and presented the revised classification system. Crismore et al. eliminated *Narrators* and *temporal connectives* from textual metadiscourse category. They reasoned that metadiscourse concentrates on guiding readers through the text and make them aware of relations and links inside the text not the temporal manner of the connections between external events (Crismore et al., 1993). Therefore, they decided to create a new subcategory called *attributers*, and put the narrators and attributers (attributors as a new concept introduced by Crismore et al., 1993) in to this new group and assigned it to interpersonal metadiscourse category. They define attributers as the references to the experts that a writer uses to add intellectual and persuasive power to the statement, while Vande Kopple (1985) applies narrators for those phrases use to show the source of discussion.

Furthermore, Crismore et al. (1993) define two categories for textual metadiscourse, *textual markers,* and *interpretive markers*; and divide each to specific subcategories. In this case, textual markers include *sequencers, reminders, logical connectives* and *topicalizers*. Interpretive markers subcategorized into *code glosses, illocution markers*, and *announcements*. Interpretive markers help the reader to interpret and better

understand the aims and writing strategy of the writer while textual markers are responsible for recognizing the discourse (Crismore et al., 1993).

Referring to *logical connectives*, Crismore et al. (1993) confirm Vande Kopple's idea that these features represent the connections between different parts of the text but they neglect the syntactic dimension of those connectors. They assigned the metadiscoursal role to coordinating conjunctions (*e.g. or, and*) and conjunctive adverbs (*e.g. hence, further*) but not subordinating conjunctions (*e.g. although, because*). They reasoned that subordinators are necessary to complete the meaning of a clause. Crismore et al. (1993) believe that if an item adds to a text as the result of choice and not a syntactic necessity, this item can be considered as metadiscourse. Hence, in Crismore et al.'s metadiscourse model, any item has either metadiscoursal or syntactic role. But in fact, there are several ways to signal an idea; so every item in the text can be considered as a mindful choice of a writer (Hyland, 2005a)

As for interpersonal metadiscourse, Crismore et al. (1993) did not change the subcategories of attitude markers and commentaries. They define *attitude markers* as those items that signal the writer's effective values, which means the writer's standpoint through the propositional matter rather than a commitment to the truth-value. At times, attitude markers are responsible for signaling the writer's viewpoint toward the writing strategies or about the writer itself. The writer's expressions of surprise, concession, agreement or disagreement toward the propositional content are examples of attitude markers. Crismore et al. (1993) claim that the specific types of punctuation such as underlying, exclamation marks and capitalization should be considered as attitude markers.

Regarding *commentaries*, Crismore et al. (1993) state that they are responsible for generating a relationship between writer and readers and engaging readers in an implicit dialogue with the writer. Commentaries can be used in several ways as follows:

1. Directly address the audience with the help of second person pronouns you or proper nouns.
2. Imperatives/directives with or without using the second person pronoun (e.g. think about it, you should consider your health).
3. Real questions that a writer replies them later in the text.
4. Rhetorical questions which readers should reply them by making inferences or using their background knowledge.
5. Tag questions that signal politeness and keeps continuing the interaction between the writer and reader.
6. Asides or comments to the reader that intervenes in propositional information.

Crismore et al. (1993) define *hedges* as linguistic features that represent the writer's uncertainty or lack of commitment to the ideational matter. Hedges do not "soften the illocutionary strength" (p. 50). There are several types of hedging: 1) modal auxiliaries (e.g., *can, could, may* and *might*); 2) linguistic features like cognitive verbs with first person subject (e.g., *I think, I feel, I guess, I suppose*); and 3) adverbs of emphatic modality that may present in one word (i.e., *perhaps, maybe*) or in a clause (e.g. *it is possible*) (Crismore et al., 1993, pp. 50-52).

Certainty markers are to some extent similar to the hedges since both of them represent the borders of writer's commitment to the truth of the ideational matter. However, they are different, since certainty markers represent the writer's full-commitment to a proposition. Linguistic features such as *certainly, it is clear, I know* and *I'm absolutely sure* are illustrations of certainty markers (Crismore et al., 1993, p. 2).

One of the key differences between Vande Kopple (1985) and Crismore et al. (1993), besides differences in subcategories, is that Crismore et al. (1993) consider punctuation marks, except periods, and typographical marks such as underlying, capitalization and numbers as metadiscourse items. They believe that it is necessary to go beyond the word and think about graphical language because they are important to convey meaning. For example, colons, commas, and parentheses can be marked as code glosses because, with their help, the writer gives readers more information about the propositional matter. So, readers can better understand, interpret and evaluate the text. The table below (Table 2.2) summarizes Crismore et al.'s (1993) metadiscourse model.

Table 2.2: Crismore et al.'s (1993) Revised Classification System for Metadiscourse

Textual Metadiscourse
Textual markers
Logical Connectives
Sequencers
Reminders
Topicalizers
Interpretive markers
Code Glosses
Illocution markers
Announcements
Interpersonal metadiscourse
Hedges (epistemic certainty markers)
Certainty markers (epistemic markers)
Attributors
Attitude Markers
Commentaries

2.5.3 Hyland's (2005a) Taxonomy of Metadiscourse

Hyland (2005a) explains metadiscourse as "reflective expressions used to negotiate interactional meanings in a text, assisting the writer (or speaker) to express a viewpoint and engage with readers as members of a particular community". (p. 37)

Hyland and Tse (2004, p. 161) decline the duality of metadiscourse and state "all metadiscourse is interpersonal in that it takes account of reader's knowledge, textual experiences, and processing needs …" They also reject the Hallidayian distinction between textual and interpersonal levels of discourse and approve that according to Thompson (2001), interactive and interactional resources are two inter-related aspects of interaction. Therefore, they consider all metadiscourse as interpersonal and categorize interpersonal metadiscourse in two groups of interactive and interactional. Interactive metadiscourse refers to those markers that a writer uses to organize the discourse coherently with regards to his/her assessment of the reader's knowledge about the topic. Interactional metadiscourse engages the reader in the text and introduces the writer's perspective about the propositional matter and the audiences.

Both interactive and interactional aspects play a significant role in communicative events and demonstrate through a number of rhetorical factors. Interactive metadiscourse includes transitions, frame markers, endophoric markers, evidentials and code glosses. Interactional metadiscourse consists of hedges, boosters, attitude markers, self-mentions and engagement markers (Hyland, 2005a).

2.5.3.1 Interactive Resources

Interactive markers are responsible for organizing the propositional matter in order to make the text coherent and convincing for readers. These features signal writers' awareness about readers' background knowledge and interests about the propositional matter, and how s/he tries to satisfy their expectations. With the help of these markers,

the writer produces a text that is equipped with readers' specific needs and represents the author's aims and intended meaning for them. Interactive resources include five broad sub-categories, namely, *transition markers, frame markers, endophoric markers, evidentials,* and *code glosses*.

Transition markers include conjunctions and adverbial phrases and are responsible for highlighting the pragmatic connections between different stages of the text. Transition markers express addition, comparison and consequence relations in the mind of the writer and indicate the relationships of discourse stretches. The main point to consider items as transition markers is that they should have an internal role in the discourse and leading the reader to recognize connections between opinions. *Additives* are those items that add elements to the discourse, such as *and, moreover*, etc. *Comparatives* signal the similarity (*likewise, equally*, etc.), or difference (*however, on the contrary,* etc.) of arguments. By consequentials, readers understand if a conclusion is approved (*thus, in conclu*sion, etc.) or opposed (*admittedly, anyway*, etc.).

Frame markers are the next subcategory. They demonstrate the text frames and help the readers to clearly follow the information in the text. As noted, items should have an internal role to be considered as metadiscourse. This means that features should organize the discourse itself, not the events of the time. Frame markers are used in several ways: 1) Sequencing different sections of the text such as *first, then, next*; 2) Labeling the steps clearly of the text such as *to summarize, in sum*; 3) Indicating the objectives of the text such as *my purpose is, I hope to persuade*; and 4) Shifting the topic such as *right, OK*.

As another resource of interactive metadiscourse, *endophoric markers* refer the reader to other sections of the text in order to help the reader understand the text easier and also, provide a support for the arguments. (i.e. See *figure 3, refer to the next chapter*).

The next subcategory, *evidentials*, refers the reader to an external reliable source that facilitates comprehension for the reader and also expresses the credibility of the writer. Earlier scholars such as Vande Kopple (1985) and Crismore et al. (1993) named this subcategory as attributors. Evidentials signals the valid and reliable sources outside the text, enable the writer to stress on his/her own credibility and help the readers' interpretation of the text. Expressions such as *X states that* and *according to* are illustrations of evidentials (Hyland, 2005a, pp. 51-52).

Code glosses provide more information in several ways including rephrasing, elaborating or explaining the statements to help readers grasp the writer's meaning better. They express the writer's anticipation about the reader's level of knowledge through expressions such as *for example, this can be defined as*, etc.

2.5.3.2 Interactional Resources

Interactional markers signal the writer's perspective towards the readers and propositional matter. These markers help the writer to intrude in the text, signal his/her comment on the argument and engage readers in the text enabling them to assess the propositional content. Interactional metadiscourse is responsible for "evaluating and engaging", "expressing solidarity", "anticipating objections" and "responding to an imagined dialogue with others" (Hyland, 2005a, p. 49). Hyland (2005a) divided interactional resources into five subcategories including *hedges, boosters*, *attitude markers*, *engagement markers* and *self-mentions*.

Hedges are those metadiscourse markers that signal the writer's uncertainty and lack of commitment towards the propositional content. With the help of hedges, the writer presents information in the form of an idea, not a fact, and hence, put the position open for discussion. However, hedges underline the subjectivity of the writer's standpoint. Epistemic modals like *can*, *could* and *would*, adverbials such as *perhaps*, *maybe* and

possibly, clauses like *it may be that*, *it is possible that* and *it is likely that* are exemplars of hedging devices.

Opposite to the hedges, writers express certainty through *boosters* and close the discussion about the information. With the help of booster devices, the writer signals his/her agreement about the topic and expresses disagreement towards other views. Boosters indicate that the writer distinguishes various viewpoints but has decided to limit this differentiation rather than extend it and handling alternatives with a single and certain voice. So, boosters close down the probable alternatives, highlight the certainty, and construct an agreed viewpoint by taking a joint position against alternatives. To signal the degree of agreement with alternatives, express the commitment to the text, and show the honor to readers, the writer should balance the utilization of hedges and boosters in the discourse (Hyland, 2005a). Lexical items such as *clearly*, *obviously* and *demonstrate* illustrate booster devices.

Attitude markers, as the next category of interactional metadiscourse, signal the writer's affective attitude towards the propositional content. These affective attitudes may include importance, agreement, surprise or obligation about the propositional information, and can be illustrated through attitude verbs (e.g. *agree*, *prefer*), sentence adverbs (e.g. *unfortunately*, *hopefully*) and adjectives (e.g. *appropriate*, *logical, remarkable*) (Hyland, 2005a, p. 53).

Self-mentions are the next category under interactive metadiscourse. Vande Kopple (1985) and Crismore et al. (1993) ignored this metadiscursive device in their classifications. Self-mentions signal the explicit presence of the writer in the text. Writers cannot avoid both their own intervention in the text and their viewpoint towards their community and readers. Writers signal their authorial identity and credibility through

linguistic devices such as first person pronouns and possessive adjectives (e.g., *I*, *my*, exclusive *we*, *our*, *ours*) (Hyland, 2005a, p. 53).

Engagement markers are the last subcategory of interactional metadiscourse. Using engagement markers, writers explicitly address audiences by asking for their attention or engage them in the text. With the help of engagement markers, writers are able to emphasis or minimize audiences' presence in the course of discourse. Engagement markers are demonstrated through lexis, including the second person pronoun *you*, second person possessive pronoun *your* or phrases such as *note that* and *you can see that*. It was not an easy task for Hyland (2005a) to draw a line between attitude markers and engagement markers as these devices are capable of having relational implications. To deal with such a limitation, Hyland (2005a) argues that engagement markers highlight readers' involvement in the text to achieve two key goals. First, they satisfy audiences' needs for disciplinary solidarity and inclusion in the text. This goal is achieved by using personal pronouns (i.e., *you*, *your*, inclusive *we*) and interjections (i.e. *by the way*, *you may notice*). Second, such devices allow the writer to rhetorically engage the readers in the text, assess the propositional content and guide readers to a specific interpretation. The illustrations of such a kind of engagement markers are questions, directives (*note*, *consider*, *see* as imperatives and should, *must*, *have to* as obligation modals).

2.6 Hyland's Standpoint on Metadiscourse

As mentioned earlier, there are various definitions (i.e., Connor, 1996; Crismore et al., 1993; Mauranen, 1993; Vande Kopple, 1985; Williams, 1981) around the term metadiscourse. Metadiscourse is defined as discourse about discourse, writing about writing or communication about communication, in the literature. All these definitions consider metadiscourse as a linguistic feature that adds nothing to the propositional content but rather signal the authors' presence in the text and his/her effort to guide the

readers through the text by organizing, interpreting and assessing the propositional content. Hyland (2005a) opposes the idea that metadiscourse is independent of the propositional matter. He states that texts carry out communicative purposes and they are not just a presentation of propositions. For him, metadiscourse is not just supported the propositional matter but make it coherent and persuasive (p. 39).

Hyland (2005a) defines metadiscourse as "self-reflective expressions used to negotiate interactional meanings in a text, assisting the writer (or speaker) to express a viewpoint and engage with readers as members of a particular community" (p. 37). Metadiscourse considers writing as social and communicative act and it signals how authors help the readers to understand the propositional content and simultaneously, present their viewpoints on both the topic and audiences. Metadiscourse features help the writers to alter a dry and non-cohesive text to a reader-friendly one, hence, express personality, reliability, and sensation to audiences (Hyland, 2000).

Hyland (2005a, p. 38) states three main principles for his definition of metadiscourse:

> *Metadiscourse is distinct from propositional aspects of discourse. Metadiscourse refers to aspects of the text that embody writer-reader interactions. Metadiscourse refers only to relations, which are internal to the discourse.*

As for the first principle, some scholars believe that metadiscourse is something separate from propositional meaning. We can see such a point of view in definitions of Lautamatti (1978), Meyer (1975) and Williams' (1981), Vande Kopple (1985) and Crismore et al. (1983). They all mention that metadiscourse is something separate from the topically related materials in the text. The proposition is a vague term but usually defined as "information about external reality" (Hyland, 2005a, p. 19). Halliday (1994)

explains proposition material as information, which is arguable. It can be mention that this tendency to separate metadiscourse from propositional meaning roots in 2 points: the first one is the transactional-interactional division of language. The second point is that some earlier scholars separate the discourse into 2 parts: primary and secondary discourse. They mention the propositional materials as primary discourse and metadiscourse - which support the primary discourse - as secondary discourse. But, as some statements may be double-function, the meaning of propositional material seems to remain vague and make it difficult to identify the metadiscourse.

Some other scholars separate the propositional and metadiscourse even more obviously. For example, Williams (1981), Dillon (1981) and Vande Kopple (2002) explain different levels or planes of meaning in such a way that one level provides topic related information for the reader and another level, emphasizes on the act of writing. But Hyland and Tse (2004) argue that it is not easy to understand how metadiscourse can make a diverse level of meaning. Hyland (2005a) believes that distinguishing between propositional matter and metadiscourse is crucial in academic writing but he claims that since the "idea of the proposition is undertheorized" (p. 38); researchers are not provided with a reliable definition of the proposition. Hyland (2005a) defines proposition as those external facts that seem proper for being discussed with audiences, while metadiscourse is internal to the discourse. He adds that it is not agreed to consider propositional content as primary and metadiscourse as secondary to the discourse, since metadiscourse change the propositional content to a coherent, cohesive and reader-friendly one. According to Hyland (2005a), metadiscourse helps the authors to express their intended meanings and create a relationship with audiences.

In relation to the second principal, Hyland (2005a) believes that metadiscourse pictures the necessity interactions for improving communications. Hence, he rejects the

duality of textual and interpersonal functions of metadiscourse (Crismore & Farnsworth, 1990; Crismore et al., 1993; Vande Kopple, 1985) and states that metadiscourse is all interpersonal since it takes the audiences' background knowledge, their textual expectations and needs into account and meanwhile, equips the writers to satisfy these considerations.

Concerning the last principle, Hyland (2005a, p. 45) believes that metadiscourse plays an important role in distinguishing between internal and external worlds. He states if we approve that textual features may carry out context-dependent interpersonal and propositional intentions, then we need a tool to recognize their primary function in the discourse.

All in all, bearing in mind the multifunctionality of linguistic elements, metadiscourse should be considered to carrying out rhetorical and pragmatic functions. It implies that specific language features cannot be considered as metadiscourse and we need to identify authors' strategies by the deployment of these features in the discourse. The reason for claiming a functional purpose for metadiscourse elements is that they fulfill a social act and engaged the people in the discussion. Many studies followed Hyland's (2005a) standpoint on metadiscourse and the present study also follows this standpoint.

2.7 Overview of the Metadiscourse Taxonomies

As presented in Table 2.3, there are some similarities and differences across the three leading taxonomies of metadiscourse. As noted, the metadiscourse model of Vande Kopple (1985) and Crismore et al. (1993) was established on the basis of Halliday's (1973) macro functions of language (*ideational, textual* and *interpersonal*). Vande Kopple (1985) believes that the primary discourse or the propositional content that expresses ideational meaning is something separate from metadiscoural elements that signal higher textual or interpersonal meaning. Both Vande Kopple (1985) and Crismore

et al. (1993) classified metadiscoursal elements into two broad categories, namely textual and interpersonal, while each category was divided into specific subcategories. In 1993, Crismore and her associates modified Vande Kopple's (1985) metadiscourse model and called the new model "A Revised Classification System for Metadiscourse Categories". Crismore et al. (1993) removed the subcategories of narrators and temporal connectives from the main category of textual metadiscourse. They combined narrators and attributors (attributors was coined by Crismore et al., 1993) and put them into a new category called *attributors*. For Vande Kopple (1985), narrators are those devices used to signal the source of a statement in the text. By contrast, Crismore et al. (1993) define attributors as references to the experts and a writer uses them to add intellectual and persuasive power to the statement. The next difference between the metadiscourse model of Vande Kopple (1985) and Crismore et al. (1993) is in introducing the *textual markers* and *interpretive markers*. For Crismore et al. (1993), sequencers, reminders, logical connectives and topicalizers are devices of textual markers. Code glosses, illocution markers, and announcements function as interpretive markers. As the next difference between the two leading taxonomies, Crismore et al. (1993) subcategorized Vande Kopple's (1985) validity markers as hedges and certainty markers.

Later on, Thampson and Thetela (1995) and Thompson (2001) claim that interaction is a two dimensional feature, including *interactive* and *interactional* aspects. On the basis of mentioned authors, Hyland (2005a) introduces a new model for metadiscourse that offers a more conceptual utilization of the term. He states that propositional matter and metadiscoursal features are firmly connected and the ideational meaning relys on the two. Hyland (2005a) concludes that metadiscourse cannot be considered just as a linguistic feature but it fulfills rhetorical and pragmatics functions. The main dispute between different models of metadiscourse is that metadiscourse does not just support the propositional matter, but makes it coherent and understandable (Hyland, 2005a). The

following table (Table 2.3) summarizes the similarities and differences between the three leading taxonomies of metadiscourse.

Table 2.3: Overview of Metadiscourse Taxonomies

Vande Kopple (1985)	Crismore et al. (1993)	Hyland (2005a)
Textual metadiscourse	***Textual metadiscourse*** → Rejected and Categorized to →	***Interactive***
1. Text connectives	**1. Textual Markers**	**Transitions**
Temporal/logical connectives reduced to	**Logical connectives**	**Frame markers**
Sequences	**Sequencers**	**Endophoric markers**
Reminders	**Reminders**	**Evidentials**
Topicalizers	**Topicalizers**	**Code glosses**
Announcement		
2. Code glosses → Categorized under → **2. Interpretive Markers**		
3. Illocution markers → Categorized under → **Code glosses**		
4. Narrators → Dropped and replaced → **Illocution markers** → **Announcement**		
Interpersonal metadiscourse	**Interpersonal metadiscourse** → **Rejected and categorized to** →	**Interactional Resources**
1. Validity markers → Divided → **1. Hedges**	**1. Hedges** → **Renamed to** →	**1. Hedges**
2. Attitude markers → Divided → **2. Certainty markers**	**2. Certainty markers** → **Renamed to** →	**2. Boosters**
3. Commentaries → Divided → **3. Attitude markers**	**3. Attitude markers**	**3. Attitude markers**
	4. Commentaries	**4. Engagement markers**
	5. Attributors	**5. Self-mentions**

2.8 Past Studies on Metadiscourse

Metadiscourse has been the subject of investigation in various genres (textbooks, journal articles, abstracts, theses and dissertations, job-postings, etc.) from 3 different angles, namely, cross-languages, cross-disciplines and the combination of the two. The following sections review some disciplinary, cross-disciplinary and a blend of cross-disciplinary and cross-linguistic studies on metadiscourse.

2.8.1 Disciplinary and Cross-disciplinary Studies on Metadiscourse

One of the attempts in metadiscourse study from the disciplinary perspective is the one made by Gillaerts and Velde in 2010. They investigated interpersonality in applied linguistics abstract to provide some evidence for the opinion that abstract is an independent genre from a research article. Gillaerts and Velde (2010) mentioned that according to Miller (1984), genres are responses to recurrent rhetorical needs including the genre of research article abstracts. From this perspective, generic nature of research article abstracts is no longer defined regarding their specific syntax and lexis but the social and institutional interaction between individuals in a context. This shed light on the interpersonal nature of research article abstracts and explains the Hyland's (2005a) reason for claiming an interpersonal characteristic for all metadiscourse devices in academic writing. Bearing in mind the above mentioned information, Gillaerts and Velde (2010) investigated the interpersonality in research article abstracts to see whether there were any differences in the use of interpersonal markers between research articles and research article abstracts, and furthermore, whether there were any changes during the past 30 years since the use of abstracts become conventional. To do so, they conducted a quantitative study and then, compared the results with the findings of Hyland (1998, 2005a, 2005b) studies. They collected 72 abstracts from various volumes of the Journal of Pragmatics published during 1982 to 2007. They made an extra sample from 1970 to 1979 but since the publication of journals started from 1977, researchers

were not able to follow the five years interval strategy. So, they chose twice 12 abstracts from 1977 and 1979 respectively. Regarding such an issue, the sample from the seventies was managed in a different section.

They had three reasons for choosing the Journal of Pragmatics. First, it had high publication rate (12 issues per volume) and high prestigious in the domain, it had a large discourse community as addressee, and it included articles from a wide range of scholars and subfields. Second, in contrast with other journals in the field, this journal included abstracts from the early eighties. Third, by limiting the corpus source to just one specific journal, they became able to control the systematic variation originated from different editorial guidelines. However, researchers believed that there is a need to caution more in generalizing the results to the whole domain.

Adopting Hyland's (2005a) model of metadiscourse, Gillaerts and Velde (2010) focused on three types of interactional elements, namely, hedges, boosters, and attitude markers. Researchers ignored self-mentions since there was no agreement on their interpersonal dimension. They also eliminated engagement markers from the analysis since they were not found in abstracts and besides; it was hard to differentiate engagement markers from attitude markers.

The abstracts were carefully read word by word and the hedges, boosters and attitude markers were manually detected. To answer the first research question, researchers did a synchronic analysis. They compare Hyland's (2005b, p. 187) with their results. Findings showed that while the total instances of hedges, boosters, and attitude markers were comparable; there was a visible difference. Abstracts contained more instances of boosters and fewer instances of hedges compared to research articles. Researchers explained such a difference as a result of the persuasive nature of abstracts. Abstracts are responsible for attracting the attention of addressees and convince them that the

article is worth reading and they are not just a summary of research articles. So it is not amazing that they contained more boosters to emphasize their claims rather than downplay them by hedges.

To answer the second research question, Gillaerts and Velde (2010) did a diachronic analysis to distinguish the changes in abstracts over times from three perspectives: length of abstracts, employment of interactional metadiscourse in abstracts, and the combination of hedges, boosters and attitude markers in abstracts. Regarding the abstracts' size, results showed that the length of abstracts increased over time and this is in line with Hyland's (2000, p. 81) findings. Furthermore, the standard deviation per decade (80s: 50, 90s: 54.7, 00s: 53.2) showed that the length of the abstracts was less uniformed in the decades with larger standard deviation.

Concerning the distribution of interactional markers, findings showed the reduction of using interpersonal markers over time. To be more specific, this difference is due to the fewer deployment of attitude markers and boosters since there was not a significant change in using hedges. In particular, the employment of hedges extremely increased overtimes while the deployment of attitude markers decreased. The use of boosters, which were the most popular category of interactional markers, were neither acquired nor lost importance with the passage of time. So, while the employment of boosters was decreased absolutely, their use was not cut back regarding other interactional devices.

As for the combination of hedges, boosters, and attitude markers, results showed that the tendency of using combined forms of these three markers increased over time. To be more specific, boosters and attitude markers were seen to have fewer instances on their own and writers gradually preferred to use hedges for mitigating a booster (e.g. a rather strong correlation) or an attitude marker (e.g. rather important findings) (Gillaerts & Velde, 2010, p. 133).

Regarding the collected data from the seventies, the analysis showed that the lengths of abstracts were shorter in an earlier volume of the journal but there was a substantial dissimilarity in the length of individual abstracts. Concerning the frequency of interactional markers, there were more instances of hedges and fewer instances of boosters and attitude markers. Researchers concluded that these two volumes from the seventies were 'ahead of their time' regarding the use of interactional markers.

Another attempt to study metadiscourse features is the one by Hyland in 1998. Hyland, who is considered as the leading linguist in the field of metadiscourse, conducted a quantitative and qualitative study in 1998 to investigate the pragmatic dimension of the metadiscourse in academic research articles. The corpus consisted of twenty-eight English research articles from four disciplines of microbiology, marketing, astrophysics and applied linguistics, which was randomly collected from the leading journals of each discipline. Adopting the Crismore et al's (1993) model of metadiscourse, all the texts were analyzed manually to extract textual and interpersonal metadiscourse, and then, two of his colleagues independently searched the corpus for more reliability. Inter-rater reliability of 0.85 (Koppa) revealed a high degree of consistency.

Results of the quantitative analysis showed the average of 373 instances of metadiscourse per paper. It was found that all the writers showed more tendency to use textual markers rather than interpersonal markers. Hedges, connectives, code glosses and evidentials were the most repeated devices in the corpus respectively. Hyland (1998) explains that the high use of hedges (over half of all interpersonal markers) emphasizes the importance of highlighting the difference between factual points and opinions in academic writing.

According to the results, there were some similarities and differences in the use of metadiscourse between the disciplines under study. The density of metadiscourse employment was remarkably the same in all the four disciplines, although 20% of them were seated in marketing articles due to over-worked relational markers, frame markers and especially hedges. The density of textual metadiscourse was also notably similar, although the reason was the frequent deployment (about 65% overall) in microbiology and astrophysics. Regarding interpersonal metadiscourse, there were notable differences between disciplines. Marketing articles contained more than 90% of instances compared with biology ones. Findings revealed that applied linguists and marketing writers employed considerably more instances of interpersonal markers compared to biology and astrophysics writers.

The use of subcategories also presented notable differences among disciplines. Hedges were the most employed metadiscourse marker in all disciplines except astrophysics in which, the most utilized metadiscourse markers were logical connectives and hedges respectively. Biologists were willing to use more evidentials and code glosses, while physicists were tended to employ more endophoric markers, and applied linguistics were willing to deploy more emphatics. The broadest range of differences amongst disciplines was assigned to the categories of relational markers, attitude markers, endophoric markers, due to the low frequency of the use of relational markers and attitude markers in biology papers and the high use of endophoric markers in astrophysics. Generally, Hyland (1998) found that the highest frequency is allocated to hedges, evidentials, and attitude markers. Regarding the use of foregoing mentioned markers, applied linguistics papers were similar to marketing ones, while microbiology papers were much the same as astrophysics ones.

Hyland (1998) describes such variations from different aspects. According to him, different deployment of metadiscourse amongst the writers of different disciplines may demonstrate the broad horizons of intellectual inquiry, structures of knowledge and their related discourse forms. Hyland (1998) adds that different channels of communication, including research articles, are restricted and described by experts of the particular community regarding the use of determined types of discourse. Such boundaries are applied to both the aspects of the propositional content and encoding of textual and interpersonal meanings. All in all, findings of this study highlight that there may be a social definition for use of metadiscourse and it may be restricted by disciplinary communities in regards to the context of use (1998, p. 448).

Hyland (1998) believes that it is possible to distinguish the different fields of knowledge by concerning their members' viewpoint through epistemological factors of that specific type of knowledge. As microbiology and astrophysics are considered as pure-hard sciences, they follow an analytical and structuralist approach, and the knowledge of these fields is formed by partially fixed "cumulative growth," "predictability of problems" and "clear criteria of acceptability" (Hyland, 1998, p. 448). On the other hand, applied linguistics and marketing are considered as soft-applied sciences and the knowledge in these fields is managed by practical ends and the research in these fields have a conflicting characteristic. They attempt to represent the influence of human action on the events (Hyland, 1998, p. 449). To summarize, the less employment of some specific metadiscourse markers in hard-pure sciences may be the result of precise topics and established boundaries in those domains. In contrast, the rich use of particular metadiscourse markers in soft-applied disciplines presents a divergent rhetorical standpoint. As the context in soft-applied disciplines is not as comprehensible as the context in hard-pure sciences, the soft applied disciplines' writers have higher

tendency to interrupt the discourse by their personal viewpoint on the discussed matter during the interaction with their readers (Hyland, 1998, p. 449).

Hyland (1998) also describes the distinction between disciplines with regard to genre analysis. According to him, the authority of persons and text-dependent interactions are considered as the crucial part of a positivist-empirical epistemology. For example, the less deployment of interpersonal markers in astrophysics and biology research articles represents the tendency of hard-pure domains to explain the incidences of utilizing textual markers. On the other hand, in science texts, writers use attitude markers to highlight their opinions and feelings by underlining what readers should focus on and how authors expect and wish their readers to react to the shared information (pp. 449-450).

Among the scholars who investigated the employment of metadiscourse amongst various disciplines, Abdi (2002) studied the cross-disciplinary use of interpersonal markers in academic research articles. The study was conducted on the basis of his idea regarding the culture-sensitive characteristic of metadiscourse, especially interpersonal markers. He studied the ways academic writers use interpersonality to indicate their identity, and also, preferred styles of interaction. To accomplish this, he analyzed fifty-five articles from two different disciplines of the social sciences and the natural sciences. All the articles were published in 40 social sciences and natural sciences journals in 1999.

The corpus of this study was selected on the basis of three criteria: genre, ESP, and text type (Grabe, 1987; Paltridge, 1996). As Swales (1981, 1990), Mauranen (1993) and Connor (1996) consider research article as a genre, Abdi (2002) chose research articles to satisfy the first criterion. To comply with the second criterion, namely ESP, the articles were chosen from two main domains of knowledge, the social sciences, and the

natural sciences. As for meeting the third criterion, Abdi (2002) restricted his study to the discussion section of research articles. Writers try to persuade their readers in the discussion section of research articles, and a persuasive text is a more appropriate context to investigate interpersonality.

Following Vande Kopple's (1985) model of metadiscourse, Abdi (2002) chose hedges, emphatics and attitude markers to be investigated in the whole corpus. Since metadiscourse features have a multifunctional nature, three experts double-checked the interpersonal markers in the texts. Functional analysis of the corpus demonstrates various identities for the writers of the two disciplines. Social science writers had more tendency to intrude in the text compared to the natural science writers. Abdi (2002) concluded that it might be because the writers of natural sciences do not feel such a requirement of subjectively to both address their readers and express the propositional content.

Moreover, it was revealed that there are significant differences between the authors of the two disciplines regarding the use of hedging. The writers of social science articles were used to convey their perspectives not as certain as the writers of natural science. Abdi (2002) considered such a distinction as a result of different nature of these two sciences since natural science writers are the reporters of the empirical and objectively observable phenomena.

Another attempt of the cross-disciplinary focus on metadiscourse is the investigation of interactional metadiscourse in results and discussion sections of academic research articles by Khedri, Ebrahimi and Chan (2013b). Researchers conducted this study bearing in mind the different application of metadiscourse in various disciplines, and different communicative functions of research articles' different sections. The corpus was selected on the basis of three criteria: 1) genre, 2) ESP, and 3) the type of text

(Grabe, 1987; Paltridge, 1996). To meet the first standard, researchers chose academic research articles as a genre since Swales (1990), Mauranen (1993), and Connor (1996) believe that academic research articles act as a genre. To satisfy the second standard, researchers picked the articles just from two main domains of knowledge, namely, soft sciences and hard sciences. Regarding the third standard, only results and discussion sections of research articles were studied. Authors have more space to run their own words in the results and discussion sections of research articles since they interpret their new findings and discuss them in these two sections.

Khedri et al. (2013b) analyzed sixteen results and discussion sections of academic research articles from four disciplines: English Language Teaching (ELT) and Economics (Eco) as representatives of soft sciences, and Biology (Bio) and Civil Engineering (CE) as representatives of hard sciences (based on Becher's (1989) taxonomy). The corpus was selected from four internationally reputed referred journals. The articles published between years 2009-2010 by University Putra Malaysia including Social Sciences and Humanities, Economics and Management, Tropical and Agricultural Sciences, and Science and Technology. Regarding the aim of the study, researchers chose just those articles that followed the IMRD (Introduction, Method, Result, and Discussion) format.

Adopting the Hyland's (2005a) taxonomy of metadiscourse, the corpus was analyzed using MonoConc Pro 2.2, a text analysis and concordance program. Then, all the articles were manually analyzed concerning the context-sensitive nature of metadiscourse. Next, due to the unequal sizes of articles from different disciplines, the number of metadiscourse markers was counted per 1000 words. Lastly, to examine the statistical differentiation between the disciplines under study, Chi-square analysis was used. Furthermore, the analysis was double-checked by an expert.

Regarding the total number of words, the results showed that hard sciences' articles included 485 words more than those of soft sciences'. This result was in contrast with Hyland's (2005b) idea that soft sciences disciplines are more interpretative compared with hard sciences and claims are more based on discussion than on validity of the applied procedures. According to Khedri et al. (2013b), the contrast between the results originated from different corpora, since Hyland (2005b) analyzed the whole body of research articles in his study but Khedri et al. just analyzed results and discussion sections. Concerning the interactional markers, findings revealed that not all of these markers are used by the writers of both hard and soft sciences, except economists. The most utilized markers by both groups were the boosters, hedges, and attitude markers, respectively. Engagement markers and self-mentions were not used even once by the writers of hard fields while the writers of soft fields used 2 cases (0.61 per 1000 words) of engagement markers and 11 cases (3.19 per 1000 words) of self-mentions. Generally, writers of soft fields showed more tendency to use interactional metadiscourse markers compared to authors of hard sciences.

As for subcategories, results showed that hedges were used more or less equally in all disciplines, although they were used a little more in soft sciences. Khedri et al. (2013b) concluded that the writers of both sciences have the same manner in demonstrating their humility and respect to their audiences by creating a space for their alternative voices. Since hedges were found as the second most used interactional marker in both sciences, researchers believed that the authors of both sciences are aware of crucial borders between the fact and opinion in the academic domain. Results showed a significant difference in the employment of boosters between the writers of the two sciences. Boosters were more favorable among writers of soft sciences. Such a differentiation showed that writers of soft sciences argue about the propositional content with more certainty. Regarding the attitude markers, writers in economics and English

language teaching used more tokens (69 cases) compared to their cognates in biology and civil engineering (50 cases). It revealed that the writers of all four disciplines feel a remarkable need for individual interpretation, and also showed that they were successful in establishing a relationship with their disciplinary community. In case of engagement markers, findings showed no instances in corpus except 2 cases in economy articles. Khedri et al. (2013b) believed that since their study was restricted to results and discussion sections of academic research articles, such a lack of occurrence does not seem odd. They reasoned that the findings sections of research articles contain more visuals than prose expression. As for self-mentions, there were no instances in biology and civil engineering research articles while English language teaching research articles contained 2 cases and economy research articles contained 9 cases. The researchers concluded that there is no metadiscursive expression of the writer's identity in biology and civil engineering articles while writers of English language teaching and economy showed a vague presence in the content.

Chi-square analysis did not show any notable statistical differences between soft and hard domains regarding interactional metadiscourse markers, except boosters. Khedri et al. concluded that the writers of soft sciences express more certainty towards their findings and left a little space for alternative opinions of their readers. For the researchers, documents were not sufficient to prove that writers of the four different disciplines under study use interactional metadiscourse markers in different ways.

2.8.2 Cross-linguistics and a Blend of Cross-disciplinary and Cross-linguistics Studies on Metadiscourse

Regarding the cross-language angle of study metadiscourse, Mur-Duenas (2011) analyzed the 24 business management research articles, 12 written in English and 12 written in Spanish. All the research articles were published during 2003 and 2004 in

international English-language journals and national Spanish journals. The frequency analysis of the datasets was done on the basis of mixed corpus-driven and corpus-based methodology. At the first stage, all the articles were read and metadiscourse markers were extracted. In the next stage, the researcher used Wordsmith Tools (4.0) (Scott, 2004) to obtain the total number of instances. Then, each instance was analyzed considering the context-sensitive nature of metadiscourse. The last stage was a chi-square statistical analysis (Preacher, 2001) to demonstrate the significance of differences.

Results showed that metadiscourse markers were used more in English research articles compared to Spanish ones. Both English and Spanish writers had more tendency to use interactional rather than interactive metadiscourse markers. However, English writers used more interactive and interactional metadiscourse markers compared to Spanish writers. Researchers concluded that the writer and reader have stronger communication in English texts than Spanish texts. According to the results, English writers guide their audience through the text with the help of more code glosses and logical markers. Furthermore, English authors highlight their role as a writer and the role of readers as active parties in discussing new knowledge. Such significant interactive roles are highlighted through more use of self-mentions and hedges in English articles compared to Spanish.

Regarding subcategories, English writers used more logical markers compared to their Spanish peers. English and Spanish texts were also different in using various subcategories of logical markers (i.e. additive, contrastive and consecutive). English writers tended to use more contrastive and consecutive logical markers and less additives and logical markers compared to their Spanish peers. As for code glosses, English texts included more instances than Spanish texts. In addition, English and

Spanish texts were different in using the two different subcategories of code glosses (i.e. exemplification and reformulating). English writers preferred to employ more exemplification code glosses compared to Spanish writers. Researchers suggested two reasons for such a frequency variation. First, different readers of international publications that may require different descriptions to become able to interpret the information in a way desired by the author and second, different international audience that their disciplinary understandings were not shared.

There were few instances of sequencers in the corpora. Topicalizers and endophoric markers were the only interactive metadiscourse categories that used more in Spanish articles compared to English ones. Previously mentioned ideas were generally summarized and new ideas were generally more introduced in Spanish articles compared to English articles.

Endophoric markers had also more instances in Spanish articles compared to English articles. Evidentials were one of the most used metadiscourse markers in the corpora. However, English articles included more instances of evidentials compared to Spanish ones, therefore, English articles were more contextualized and justified. Hedges were also among the most common used metadiscourse markers in both sub-corpuses. The researcher concluded that tentative representation of the new knowledge is a crucial and significant dimension of academic writing.

Spanish articles contained more boosters compared to English articles. The researcher concluded that Spanish academic writers are more tend to assertively express their claims. He added that the higher instances of boosters and lower instances of hedges in Spanish articles demonstrate the more forcefully statement of arguments in Spanish articles compared to English ones. The researcher reasoned that: i) Spanish articles have smaller and more homogeneous readership that their familiarity with each

other causes them not to have many cautious statements, and ii) Spanish culture tends to the less attenuated style of academic writing.

Another attempt to study metadiscourse through the lens of culture is the one by Kim and Lim in 2013. Considering the culture-sensitive nature of metadiscourse, Kim and Lim (2013) investigated metadiscourse markers in 20 English and 20 Chinese research articles from the field of educational psychology. To consider the comparability of the genre under study (Adel, 2006), researchers chose the introduction sections of academic research articles. The corpora were comparable regarding the selected field, type of text (experimental articles) and the journals (a prestigious journal published in the respective country). Furthermore, the whole corpora were selected from the published articles between 2003- 2007 since according to Swales and Najjar (1987); the genre of research article might change during the periods of time due to the rhetorical needs.

The corpora were analyzed following the Hyland's (2005a) metadiscourse model, concerning the context-sensitive nature of the metadiscourse. The results of the quantitative analysis were included the general distribution and the density of metadiscourse in each category. Metadiscourse density is used to enable the researchers to compare different size of samples.

Results revealed that the most employed metadiscourse markers in English introductions were evidentials (58.6 %) and transitions (18.5 %). Comparably, evidentials (56%) and transitions (17.4%) were also the most deployed metadiscourse markers in Chinese introductions. The third favorable metadiscourse markers were hedges (55%) in English introductions and endophorics (12.3%) in Chinese introductions. The least deployed metadiscourse marker used were attitude markers (4.2%) in English introductions, and attitude markers (0%) and engagement markers (0%) in Chinese introductions. Both English and Chinese academic writers used few

instances of self-mentions. It showed that both English and Chinese academic writers tend to communicate impersonally with their readers by employing inanimate constructions instead of using we- or I- pronoun patterns.

Functional analysis of the corpora showed that evidentials were used to support the writer's statement. Transitions were used to define the key concepts, provide clarification, centrality claim, justifying the purpose or focus of the study, and start off statements of gap indication in the literature or counter-claiming. Hedges were used to expressing the writer's uncertainty about the propositional matter.

Researchers believed that there were two possible reasons for density differentiation of metadiscourse markers in the corpora. The first one is the different size of the two datasets since Chinese introductions had shorter lengths compared to English ones. The second reason is that Chinese proses are more reader-responsible (Hinds, 1987; Lee, 2001) so readers are expected to find the relationship between different parts of the text and the whole text.

According to the results, Chinese writers used interactional markers two times lower than their English peers. Besides, two categories of interactional markers (i.e. engagement markers and attitude markers) were not used in Chinese introductions. Researchers reasoned that Chinese writers control the level of personality in the text in order to keep the distance between writer, text, and reader. Besides, Chinese writers used more interactive devices compared to interactional ones. It shows that Researchers Chinese writers try to connect information in the text in order to make it explicit. Researchers concluded that reader-responsibility prose has a greater influenced on the way of using interactional devices in Chinese academic writing compared to using interactive devices. Researchers reasoned that academic writing domain is more complicated than 'technical matters in which ''appropriate'' skills are acquired and

novices become members of an expert community' (Lea and Street, 1998, p. 170). Chinese writers, similar to English writers, used more interactive metadiscourse markers compared to interactional metadiscourse markers. This similarity highlights the "influence of English as an international language (see Shi, 2002) and as an academic lingua franca (Ammon, 2007; Björkman, 2011; Dewey, 2007) on Chinese academic writing" (Kim & Lim, 2013, p. 147). Researchers concluded that Chinese academic writers are informed about the need to follow the rhetoric norms of English academic writing in order to publish their papers in the international and local journals.

2.8.3 Cross-linguistics and a Blend of Cross-disciplinary and Cross-linguistics Studies on Metadiscourse in English and Iranian Context

In 2009, Abdi studied the deployment of metadiscourse markers in English and Persian research articles from six disciplines to find out if Iranian writers follow the norms of discourse community or preserve the cultural identity and norms of their first language. To this end, Abdi (2009) analyzed a corpus of 72 research articles (36 English and 36 Persian) from 6 disciplines (3 hard and 3 soft science). The researcher selected both hard and soft sciences since he believed that both branches are related to various research paradigms (Guba and Lincoln, 1994) and different research paradigms require different rhetorical choices. English articles were chosen from the ScienceDirect (http://www.sciencedirect.com) and Persian articles were chosen from the SID database (http://www.sid.ir). All the articles had at least one native writer. The entire corpus was analyzed adopting the Hyland (2005a) metadiscourse model. An average of 4000 words for every six articles from each discipline was considered as the criterion length since the Persian articles were remarkably shorter than English ones. Then, the researcher adjusted the raw frequencies to the criterion length. According to the results, English and Persian writers employed the interactive devices equally (51% and 49%, respectively). Interactive markers were used in a similar pattern in English and Persian

datasets except for code glosses and frame markers. Since the role of interactive devices is guiding readers through text, the researcher concluded that both English and Persian writers are conscious about the readers' needs and also, he concluded that Iranian writers follow the norms of discourse community regarding the use of interactive metadiscourse markers. Abdi (2009) argues that there is a "close relationship between some interactive metadiscourse markers and the nature of immediate propositions" (p. 9). He explains some articles contain lists, tables or diagram that increase the need for the employment of more frame markers and endophoric markers; hence, the higher frequency of such markers in these research articles should not be considered as identity variation.

Regarding the interactional devices, Abdi (2009) states that the use of such markers is more related to identity since they have culturally-motivated options. Results of the corpus analysis showed that English writers (67%) used interactional devices twice more than their Persian cognates (33%). Abdi (2009) concluded that Iranian writers follow their cultural identity in the deployment of interactional devices. It may be for the reason that Persian writers know their articles have a limited group of audiences (Persian speakers) from the discourse community so they do not try to adjust their texts' rhetorical structures. The pattern of using interactional markers was significantly different in English and Persian corpuses except for engagement markers that were the less frequent one in both datasets. Self-mentions had the most different pattern in comparing the two datasets. Persian writers used fewer instances of self-mentions hence, Abdi (2009) concluded that Persian writers still follow the positivists' view to write an impersonal and dry texts. The second biggest difference between the two datasets regarding the employment of interactional devices, were hedges. Persian writers employed limited instances of hedges compared to their English counterparts (74% compared to 26%). The pattern of using boosters was also different in both groups

of articles. Persian writers used more boosters (56%) compared to the English ones (44%). Regarding the deployment of attitude markers, English writers showed more tendency to place their emotional assessments in the text and create a closer relationship with their audiences (58% in English and 42% in Persian articles). Abdi mentioned that this does not mean Persian writers are not eager to build close connections with their readers, and fewer instances of attitude markers in Persian articles demonstrate that there is not any necessity to overtly develop such relations in Persian culture. Abdi (2009) concluded that the deployment of attitude markers, self-mentions and engagement markers seems to be optional while using hedges and boosters is more culture dependent. He explained that this means changing the pattern of employing self-mentions, attitude markers and engagement markers is easy but changing the pattern of hedging and boosting is more challenging.

Rahimpour and Faghih in 2009 also conducted a study to compare and contrast the use of metadiscourse markers in English and Persian research articles to see if Iranian writers follow the norms of discourse community or stick to their cultural norms when they write. The corpus of the study was consisted of 90 research articles from the field of applied linguistics and contained three types of articles: English texts written by English native writers, English texts written by native Iranian writers, Persian texts written by native Iranian writers. All the articles were published during the period 1998 to 2005. The entire corpus was analyzed adopting the Hyland's (2004) model of metadiscourse. Regarding the different length of articles, frequencies were normalized to 1000 words. The researchers analyzed the entire corpus twice regarding the contextual nature of metadiscourse markers. To guarantee the reliability of the analysis, a corpus of 45 articles was extracted from the main corpus and analyzed again. This was following the idea of Connor and Mauranen (1999) that state the same result can be repeated in case of the same data collection procedure.

The results of comparing the frequencies of metadiscourse markers in native English and native Persian research articles showed a remarkable difference between the two. Out of the total 1355 metadiscourse elements in native English and native Persian articles, 662 were used by English (48.9%) and 693 were used by Iranian writers (51.1%). Transitions were the most frequent interactive metadiscourse markers in both datasets, followed by code glosses, endophoric markers, frame markers and evidentials. Regarding the interactional metadiscourse markers, out of the total 1193 interactional devices in both datasets, 686 were used by English (57.5%) and 507 were used by Iranian writers (42.5%). The hedges were the most frequent interactional devices in both datasets. English writers used more boosters and attitude markers but less engagement markers and self-mentions compared to their Iranian cognates.

In case of English articles written by native English and native Iranian writers, there was a significant difference between the two groups in using interactive metadiscourse markers. Out of the total 1630 interactive forms in the two datasets, 662 were deployed by English (40.6%) and 698 (59.4%) were deployed by Persian writers. hence, Iranian writers used more interactive devices compared to their English pairs. Transitions were the most frequent metadiscourse elements in both datasets, followed by code glosses and endophoric markers. Iranian writers used more transitions, frame markers, endophoric markers and code glosses compared to their English pairs. Regarding the interactional devices, out of 1323 instances of interactional metadiscourse markers, 686 were employed by English (48.1%) and 637 were employed by Iranian writers (51.9%). Therefore, Iranian writers used slightly more interactional devices compared to their English cognates. Hedges were the most frequent interactional devices in both datasets. English writers used more hedges but less boosters, attitude markers, engagement markers and self-mentions compared to their Iranian pairs.

As for comparing the types and frequencies of interactive metadiscourse devices employed by Iranian writers when they write in English and Persian, results demonstrated that Iranian writers use metadiscourse significantly different in the mentioned two situations (the authors of English and Persian articles were the same person**s**). Transitions were the most frequent interactive device in both datasets. Iranian writers used significantly more transitions, frame markers, endophoric markers and evidentials but similar amount of code glosses when they write in English. Regarding the interactional devices, out of 1144 interactional devices in the two datasets, 637 were employed in English and 507 were employed in Persian texts. Hedges were the most frequent interactional devices in both datasets. Iranian writers used more hedges and boosters but less attitude markers, engagement markers and self-mentions when they write in English.

Another attempt of examining metadiscourse elements in English and Iranian research articles is the study of Zarei and Mansoori (2007). Bearing in mind the influence of L1 on L2 writing, Zarei and Mansoori investigated the use of metadiscourse in a corpus of 19 English articles (9 written by native English and 10 written by native Iranian writers) from the fields of applied linguistics and computer engineering. The reason of selecting the mentioned two fields of study was two-folded. First, researchers were aimed to include both humanities and non-humanities streams and second, they tried to prevent the influencing of the issue of single topic on generalizability of the results.

The articles were chosen following random sampling from renowned journals of the related fields, which published during the period of 2004-2006. To prevent the issue of idiosyncrasy and particularity of writers' style, they rechecked the selected articles to assure they were not written by common authors. Only articles written by native English

and Iranian writers were selected and in case of multiple authorship, articles with at least one native writer were picked out. The corpus consisted of 102293 words (50602 and 51691 words for English and Iranian datasets, respectively).

The corpus was analyzed adopting the Hyland and Tse's (2004) metadiscourse model since this model is capable of capturing the fundamentals of academic writing. The researchers just analyzed the main body of articles (abstracts to conclusions) and information such as the names of authors or journals, website address, acknowledgments, references and so on were removed. The whole corpus was read and analyzed carefully and the two writers compared their analysis to guarantee the reliability.

Results revealed that there were 6146 metadiscourse features in the corpus of 102293 words (1 per 18 for English dataset and 1 in 15 for Iranian dataset). This finding led the researchers to the conclusion that academic texts contain a large number of metadiscourse elements; hence, metadiscourse should be taken seriously in this genre.

A more precise analysis of the corpus showed that both English and Iranian writers were more eager to employ interactive resources (English 5.05% and Iranian 3.7%) compared to interactional ones (English 1.4% and Iranian 1.8%). The researchers concluded that both groups of writers give priority to textual congruity rather than creating close relationship with their readers.

Iranian (3.7%) writers used more interactive elements compare to their English cognates (5.05%) but remain lower in the deployment of interactional markers (English 1.8% - Iranian 1.4%). In general, analysis showed that English and Iranian writers use metadiscourse markers significantly difference and this difference is more salient in the use of interactive resources, not interactional ones. Such a salient difference

demonstrates that Iranian writers are more focused on writing a coherence text. Hence, they may produce longer texts since they provide more guidance for their readers to help them better understand the propositional matter. English writers used slightly more Interactional devices compared to their English cognates, so they were more eager to create closer relations with their audiences.

The more precise analysis showed that most and least frequent markers in English articles were transitions (87%) and attitude markers (0.07%), respectively. In Persian dataset, transitions (1.62%) were also the first priority and were used more than in English dataset. But the least frequent markers, unlike English dataset, were engagement markers (0.03%). These findings showed that transitions were the most focused metadiscourse markers for both English and Persian writers in academic writing. Besides, Persian writers were more inclined to guarantee that their readers could grasp the intended matter. The infrequent use of attitude markers by English writers may prove the opinion of Stapleton (2002) that says academic writing requires objectivity. Furthermore, Persian writers' more use of attitude markers (0.13%) compared to their English cognates, showed that they are more willing to clearly claim the possession of their findings. The second most frequent markers in English dataset were evidentials while in Persian dataset, the fifth position allocated to these markers. Zarei and Mansoori (2007) concluded that English writers are more focused on preparing a robust foundation for documentation of the information. The third position was allocated to code glosses and hedges in English dataset while code glosses ranked as second and hedges ranked as eight in Persian dataset. The proximity of code glosses and hedges in English articles have a legitimate reason. Code glosses are used for interpreting the findings; hence, English writers used hedges equal with code glosses in order to moderate the strength of their interpretation. In contrast, Persian writers utilized more code glosses and less hedging devices. Zarei and Mansoori (2007) concluded that

Persian writers are not as conservative as English writers. Boosters were placed at eighth position in English (0.3%), and fourth position in Persian (0.63%) datasets. For Zarei and Mansoori (2007), this showed that Persian writers have more powerful position in their text compared to their English cognates. Besides, Persian writers believe that their findings are monolithic and valid while their English cognates follow a more conservative way in presenting their new findings and leave an open space for readers to interpret them. Generally, the results showed that Persian writers employed more metadiscourse markers and as Z-test demonstrated, there were significant differences in the employment of all metadiscourse markers between English and Persian datasets, excluding endophoric markers. Zarei and Mansoori (2007) believed that the higher frequency of metadiscourse markers in Persian articles can not always assumed as a facilitator of readers' understanding, especially for readers with different linguistic backgrounds (Martin, 2003). In contrast, this overuse of metadiscourse elements may influence the accuracy and conciseness of the propositional links.

Abollahzade also conducted a cross-cultural study on metadiscourse in 2011. He believes that cross-cultural analysis of metadiscourse is a device to uncover the rhetorical tendencies of academic writers and the methods they use to direct the readers through the text (p. 289). Following such an idea, he investigated the distribution of interpersonal metadiscourse in the conclusion sections of academic research articles. He analyzed 60 applied linguistics research articles from leading applied linguistics journals, 30 articles written in English by native English writers and 30 articles written in Persian by native Persian writers. Texts were analyzed on the basis of Vande Kopple's (1985) classification of metadiscourse to explore the extent of differentiation between Iranian and Anglo-American academic writers regarding the use of metadiscourse. The study was restricted to three markers of interpersonal metadiscourse including hedges, emphatics, and attitude markers since the researcher considered them

as the key features of writer-reader conversation. The entire corpus was analyzed respecting the use of hedges, emphatics, and attitude markers. Considering the multifunctionality of metadiscourse, extracted metadiscourse devices were coded and then an analysis sheet was attached to each extract. With the aim of achieving more reliability, a specialist in linguistics was asked to re-analyze the corpus.

The functional and contextual analysis revealed the different use of interpersonal markers between the two groups of writers. Results showed that all the three mentioned metadiscourse markers were used by both groups, while hedges were the most utilized between the three. According to the findings, English writers used more interpersonal resources, over one and half times, compared to their Iranian peers. It reveals that they have more familiarity with forming a text and needs of their genre and discipline. Abdollahzade (2011) believes that English writers establish a dialogic relationship by indicating respect, humanity, and attitudinal and assertive linguistic features to make the readers accept their arguments.

Regarding the results, there was no significant difference in the use of hedges between the two peers while they employed emphatics and attitude markers considerably different. English academic writers were more committed to the deployment of emphatics and attitude markers compared to Iranian academic writers. Abdollahzade (2011) explains that the reason for indicating certainty and attitude is not the same across these two groups of authors. Findings indicate that emphatics are used by English writers with the aim of 1) underlining the significance of their findings and share them, 2) intensely emphasizing the current knowledge, 3) stressing the results to obtain readers' positive evaluation on results, and 4) highlighting the need for further research to reinforce the base of research. In contrast, emphatic markers were the device

of stressing the results and knowledge, which highlight the writers' findings and support their initial hypothesis (p. 292).

Concerning the attitude markers, results revealed that English writers deployed them to stress some rhetorical functions as follows: 1) personal evaluation of the findings, 2) referencing the reasonability of their assumptions, 3) interestingness of the findings, 4) importance of findings for the researcher(s), and 5) unfulfilled commitments and compulsions of the members of the community. On the other hand, attitude markers are just the devices of expressing interest and significance of the findings for Iranian academic writers. Abdollahzade (2011) concluded that such differentiations are rooted in various factors including the extent to which writers are sensitive and familiar with readers, aim, cultural proclivities and the predispositions of the disciplinary genre.

Abdollahzade (2011) also conducted an intra-group comparison regarding the status interpersonality. Results revealed that in case of English articles, there was no significant difference between the use of emphatics and hedges, nor between attitude markers and emphatics. In contrast, there was a significant difference between the employment of emphatic and hedges, and also between attitude markers and emphatics in Iranian articles. Such a differentiation presents the more sensitivity of English writers to their readers and also the fact that English writers are the better conveyors of objectives rhetorically.

Another example of discovering the cross-linguistics similarities and differences in the use of metadiscourse is the one by Mur-Duenas (2011). Considering the cross-cultural differences in using metadiscourse markers, he compared English and Spanish research articles from the field of business management.

As for analytical framework, Mur-Duenas (2011) adjusted previous taxonomies of metadiscourse on the basis of needs to cross-culturally analyze English and Spanish research articles. His adjusted taxonomy was included both discoursal (new items found in datasets) and typographical (dashes, brackets, etc.) markers and besides, some categories of metadiscourse were redefined. He considered logical markers, code glosses, sequencers, topicalizers, endophoric markers and evidentials as interactive metadiscourse markers, and hedges, boosters, attitude markers, engagement markers and self-mentions as interactional metadiscourse markers.

Zarei and Mansoori carried out another study on metadiscourse in 2011. They compared and contrasted the use of metadiscourse markers of articles from the two disciplines of applied linguistics and computer engineering across the two languages of English and Persian. The selected disciplines are representatives of the two general streams of humanities (applied linguistics) and non-humanities (computer engineering). The English language was selected as an international lingua franca and Persian language was chosen since Zarei and Mansoori (2011) believed that Iranian writers are most likely subject to their L1 inferences, which lead them to misunderstanding. The entire corpus was chosen randomly from the well-known journals published during the period of 2004-2006. All the articles had at least one native writer from the related language. The entire corpus contained 102293 words (50602 words in English and 51691 words in Persian datasets) and was analyzed adopting the Hyland and Tse's (2004) metadiscourse model. Quantitative analysis showed that 6257 words out of the 102293 words had the role of metadiscourse (1 token per 16 words) while English dataset contained slightly fewer metadiscourse markers (2811 and 3446 in English and Persian datasets, respectively). Regarding the disciplines, 1 per 14 words in applied linguistics and 1 per 18 words in computer engineering datasets played the role of metadiscourse. Such a high frequency shows that metadiscourse have a crucial role in

academic texts and reject the idea of Crismore and Farnsworth (1990) about the marginal role of metadiscourse in the texts.

In case of comparing and contrasting English disciplines, results demonstrated that 1 per 15 words in Applied Linguistics articles and 1 per 20 in computer engineering articles had the role of metadiscourse. English Applied linguistics writers employed both interactive and interactional devices more than English computer engineering writers (4.33% vs. 3.41% and 2.21% vs. 1.4%). The analysis of metadiscourse markers showed that writers of the two disciplines prioritize these elements differently. Transitions (1.25% in applied linguistics and 0.85% in computer engineering) and attitude markers (0.08% in applied linguistic and 0.06% in computer engineering) were the most and the least frequent metadiscourse markers in both disciplines, respectively. Zarei and Mansoori (2011) concluded that for the writers of the both disciplines, transitions were the central to academic writing but still, applied linguistic writers employed more transitions to guarantee the audiences can understand their intended meaning. By using few numbers of attitude markers, the writers of the two disciplines showed their desires for detachment and not to have close relationship with their audiences. In applied linguistic articles the second position were given to evidentials while the respective marker relegate to sixth position in computer engineering articles. This indicated that the applied linguistic writers require paving a stronger ground for documentation since they have to deal with less quantitative data. Code glosses and hedges were used similarly in both disciplines. The writers of the both fields took a conservative position by employing the code glosses and hedges equally. As code glosses are responsible for preparing additional information and interpreting the ideational matter, the writers of the two disciplines try not to seem prejudice by the employment of equal amounts of code glosses and hedges to let the hedges soften the force of their interpretations. Applied linguistics writers employed more self-mentions;

hence, English humanities writers have a more powerful voice compared to their non-humanities cognates. Hedges and boosters were used more in applied linguistics articles compared to computer engineering ones. It shows that humanities writers give comment more cautiously on findings compared to their computer engineering counterparts.

Regarding Persian disciplines, similar to English ones, applied linguistics writers used more interactive and interactional resources compared to computer engineering writers (5.23% vs. 4.82% and 1.72% vs. 1.07%, respectively). Moreover, again similar to English articles, evidentials were more frequent in applied linguistics articles compared to computer engineering. However, contrasted to English articles, both Persian applied linguistics and computer engineering writers employed more boosters compared to hedges. Zarei and Mansoori (2011) concluded that Persian academic writers are eager to express more certainty about results even in humanities, in which, results' interpretation is more carefully. Furthermore, computer engineering articles used more engagement markers (0.04% vs. 0.01% for applied linguistics and computer engineering, respectively) and less attitude markers (0.18% vs. 0.09% in applied linguistics and computer engineering, respectively). There was no significant difference in the employment of transitions, code glosses, frame markers and self-mentions in the two disciplines.

As for comparing non-humanities disciplines of English and Persian, interactive resources were more frequent in Persian computer engineering compared to English one (4.82% vs. 3.41%). In contrast, English computer engineering articles contained more interactional resources compared to Persian ones (1.4% vs. 1.07%). Zarei and Mansoori concluded that comprehensibility of the text is of a higher value for Persian writers compared to creating close relationship with their audiences. Persian writers used more transitions compared to their English cognates. For Zarei and Mansoori (2011) this

result supported the idea that accuracy and comprehensibility of the text is override the close relationship between the writers and audiences. English non-humanities writers employed more engagement markers compared to their Persian cognates. Such a result demonstrated that creating a close link with readers is of a high value for English writers. Code glosses were sat in the second position in Persian and the fifth position in English datasets. This demonstrated that Persian writers are more focused on interpreting the results. Boosters were more frequent in Persian articles. This result indicated that Persian writers are more eager to speak openly about their views compared to English ones. Instead, English writers were more focused on documenting their results and cautiously speaking out their ideas by employing more evidentials and hedges. There was not any significant use of self-mentions, frame markers, endophoric markers and attitude markers in both datasets. Zarei and Mansoori (2011) concluded that the two disciplines are significantly different regarding the use of metadiscourse devices.

In case of comparing and contrasting English and Persian Humanities, results demonstrated a significant difference in patterning the metadiscourse devices in two disciplines, except for endophoric markers. Interactive devices were more frequent in both datasets. Transitions (1.25%) and attitude markers (0.08%) were the most and least frequent elements in English dataset, respectively. Persian writers also capitalizes maximally on the transitions (1.70%) but employed more transitions compared to their English counterparts. In contrast to English writers, Persian writers capitalized minimally on engagement markers (0.04%). Infrequency of attitude markers in English datasets demonstrated that English writers leave an open space for their readers to interpret the ideational matter. Evidentials, hedges and engagement markers were more frequent in English dataset while Persian writers capitalized more transitions, code glosses and boosters. Zarei and Mansoori (2011) concluded that “documentation,

caution and the relations of writers and readers" (p. 47) is more focused in English dataset while Persian writers concentrated more on "cohesion, text understandability and writers' resolute expression of ideas". Dissimilar to non-humanities corpus, which contained insignificant employment of self-mentions, this device was frequent in English applied linguistics corpus. Zarei and Mansoori (2011) concluded that the presence of the writer is more critical in English humanities compared to Persian.

Attaran (2014) compared the use of interpersonal metadiscourse of English and Iranian ESP research articles. To this end, she studied the deployment of metadiscourse in the discussion sections of 30 English ESP research articles (15 written by native English and 15 written by Iranian writers) following the Hyland (2005a) model of metadiscourse. The reason for choosing the discussion section for analysis was two-folded. First, the researcher followed the idea of Siami and Abdi (2012) that mentioned metadiscourse markers are mostly employed in the discussion sections of research articles; hence, she limited her analysis to the discussion section. Second, the researcher believed that the longer length of the discussion sections of research articles (compared to introduction section for example), provide a better chance for providing data.

All the articles were published during the period of 2000 to 2011 from the famed journals adopting the random sampling procedure. The reason for choosing the field of ESP was the researcher's familiarity with the field. The corpus was analyzed both automatically and manually due to the context-based culture of metadiscourse. The researcher double-checked the analysis to improve the reliability (rxy=0.84)

As for interactive metadiscourse, results showed that both groups of ESP writers enjoyed interactive metadiscourse in their research articles while Iranian ESP writers used slightly more of these markers compared to their English cognates. This difference was not significant. The most and common interactive metadiscourse markers in both

datasets were transitions and code glosses, respectively. Iranian ESP writers surpassed their English pairs in the deployment of transitions, evidentials and endophoric markers while English ESP writers outweighed Iranians in using frame markers and code glosses. Endophoric markers were used more in Iranian research articles and evidentials were employed more by English writers.

Regarding the interactional metadiscourse markers, analysis showed that the most frequent interactional marker in the Iranian dataset were hedges while there was not any instances of attitude markers and engagement markers. In English articles, hedges and self-mentions were the most repeated interactional markers. There were a few instances of attitude markers and engagement markers in the English research articles but the number was not significant. Self-mentions were employed more in English dataset compared to Iranian one.

2.8.4 Discussion on Past Studies on Metadiscourse

The turf this study is dealing with has been tilled before to some extent. Among the reviewed studies, Abdi (2002) and Abdollahzade (2011) are the most relevant to the current research. They are As argued in the previous section (please refer to subsections 2.7.1 and 2.7.3), both studies involve an investigation of three interactional metadiscourse features, namely, hedges, emphatic markers, and attitude markers. However, Abdi (2002) focused on discussion sections and Abdollahzade (2011) focused on conclusion sections.

The present study made an attempt to cast more lights on the use of metadiscourse in writing research articles in a less focused discipline (dentistry) considering both … markers in the whole body of an academic research article.

CHAPTER 3: METHODOLOGY

3.1 Introduction

As mentioned in chapter 1, the present research is focused on exploring the use of metadiscourse markers in dentistry research articles written by International and Iranian writers. This chapter includes 1) the conceptual framework of the study, 2) the research design, 3) the corpus of the study, 4) the analytical framework, 5) the sampling procedures and, 5) the analyzing procedures.

3.2 Conceptual Framework

The impact of individual writing tradition and culture on different genres has attracted the attention of so many researchers in recent years. This enthusiasm highlights the notion of community in the domain of discourse studies. According to Hyland (2005a), the notion of community is strictly linked with the notion of genre and one determines the domain of the other. In other words, they describe and explain the process of social construction of the meaning. The Research article is a prominent academic genre and highlights the conventions of the writing and norms of any specific discourse community. Since research articles represent the rationales and social beliefs of any different disciplinary community, researchers must be totally familiar with the conventions, rhetorical structures, and goals of their discourse community. This is due to the fact that research articles undergo strict processes of review in order to be published. Therefore, the writers are required not only to be familiar with the culture of the language they write in but also they should understand its linguistic features so as to create a text which is up to the standards of the preferred journal. Metadiscourse is considered as one of the crucial parts of the linguistic features, which plays an important role to build up a persuasive, unfolding and reader-friendly text that could satisfy the expectations of the discourse communities' experts. Thus, the research design was

formed on the basis of the above-mentioned essentials to demonstrate how the corresponding research questions presented in chapter 1 are answered.

Regarding the theories which have influenced the study, the below diagram (Figure 3.1) demonstrates the conceptual framework of the study:

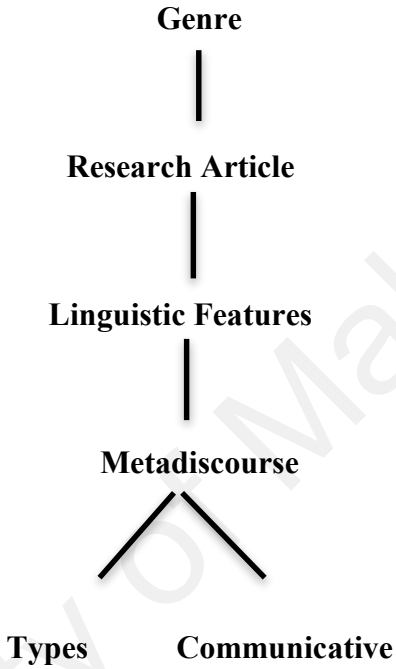

Figure 3.1: Conceptual Framework of the Study

3.3 Theoretical Framework

As mentioned in chapter two, it was Zelling Harris who first introduced the word metadiscourse in 1959 to recommend an approach to "understanding the language in use" in order to show the language producers' effort for assisting "a receiver's perception of a text" (see Hyland, 2005a, p. 3). Later, other scholars elaborate the notion of metadiscourse with the theoretical support of Halliday's (1973) Systemic Functional Linguistics (SFL). SFL attributes three metafunctions to the language: ideational, interpersonal, and textual. The ideational function of language points to expressing ideas and experiences through language and it is similar to propositional content. The

interpersonal function refers to language use for encoding interactions and lets us interact with others. The textual function refers to how language is used to organize the text and make it coherent. In viewing metadiscourse through the SFL lens, metadiscourse distinguishes from propositional matter and categorized as textual and interpersonal (e.g. Crismore et al., 1993; Vande Kopple, 1985). The textual markers of metadiscourse are those features that let us uncover the process of forming a coherent and cohesive text through relating discrete propositions (Vande Kopple, 1985). Interpersonal markers of metadiscourse for Vande Kopple (1985) are those items that through them, the writer signal his/her personal view and reactions toward the propositional matter and control his/her interaction with the reader.

Hyland and Tse (2004), and Hyland (2005a) decline the duality of metadiscourse and claims that all metadiscourse is interpersonal as it evaluates the knowledge of the reader, textual skills, and handling needs. They also reject the Hallidayian distinction between textual and interpersonal levels of discourse and approve that according to Thompson (2001), interactive and interactional sources are two interdependent perspectives of the interaction. So, they consider the whole metadiscourse markers as interpersonal and categorize interpersonal metadiscourse into two groups of interactive and interactional. Interactive markers of metadiscourse are those markers that the writer uses to organize the text coherently with regards to his/her assessment of readers' knowledge about the topic. Interactional metadiscourse engages the reader in the text and introduces the writer perspective about the propositional matter and the audiences. The present study followed Hyland's (2005a) metadiscourse model to analyze the data.

3.4 Research Design

The present study utilized a blend of quantitative and qualitative research approaches to acquire the best advantages of both methods. Wiersma (2000) states that qualitative and quantitative methods perform two markedly different roles in distinguishing the phenomena under study. Krathwohl (1998) adds that qualitative method is responsible for investigating a phenomenon more in words, while quantitative method interprets a phenomenon from a numerical perspective. The qualitative research method is "a research that produces descriptive data, people's own written or spoken words and observable behavior" (Taylor & Bogdan, 1998, p. 7). Furthermore, Marshall and Rossman (1995) point out that qualitative research is responsible for both discovering processes (how) and describing phenomena (what) that are not briefly understandable.

As mentioned above, the present study exploited a mixed approach. Quantitatively, this study investigates metadiscourse in dentistry experimental research articles written in English by International and Iranian writers with the aim of uncovering the likely similarities and differences in terms of type and frequency. Qualitatively, the present study investigates how metadiscoursal features have been employed in English dentistry research articles written by International and Iranian writers.

3.5 The Corpus

The corpus used in this study consists of 20 English dentistry articles (10 by International and 10 by Iranian writers). The whole corpus amounted to 56920 words. All the data are comparable in terms of the ESP (dentistry) and the journals (prestigious ones). Besides, both datasets were published in the period 2011-2015. Regarding the journal selection, both International and Iranian research articles were culled from a pool of representative International and local peer-reviewed dentistry journals in order

to enhance and safeguard the validity of the data selection in particular and the findings in general. The International dentistry research articles were selected from the recognized journals of *Clinical Implant Dentistry and related research* and *Clinical Oral Implants Research*. These are high impact factors and ISI indexed journals which are available online to the international readership. The dentistry articles written by Iranian writers in English were selected from the local renowned journals of *Dental Research, Dental Clinics, Dental Prospects* and *Dental Research*. As with the above international journals, these local journals follow systematic and strict policies for article submission and acceptance. They have the chief, associate, and senior editors and high rate of submission, and thus rigorous and systematic editorial and peer-review policies. In addition, the Ministry of Sciences, Research, and Technology of Iran has ranked these local journals as quality or 'research-based' journals. Overall, both local and international journals are comparable in the view of the vast discourse community they belong to, thus covering a wide range of topics within the discipline. The focus of this study is on comparing and contrasting the language of ISI (International) and local (Iranian) journal publications. ISI articles are used as a comparison as they internationally recognized and are mostly written in perfect English due to the rigorous and systematic editorial and peer-review policies. For this study, the International authors are authors of ISI articles, with nationalities other than Iranian. As for the Iranian (local) articles, the authors comprises solely of native Iranians that are trained and based in Iran. The researcher, who is an Iranian, has double-checked their names and affiliations for authentication.

Table 3.1 illustrates the details of the corpus under study. Abstracts are not included in the current study since they are considered as a distinct genre from the genre of research articles (Dahl, 2004; Lores, 2004)

The researcher considered the ethical issues of research following the Booth, Colomb & Williams (1995, PP. 255-256) principles for ethical researcher (Consider Table 3.2).

Table 3.1 The Corpus

	International	Iranian
No. of research articles	10	10
No. of journals	2	2
Length of articles (range of words)	1829-5102	1400-3826
Linguistic corpus size	33,156	23,764
Total size	**56920**	

Table 3.2: Booth, Colomb & Williams's Principles for Ethical Researcher

Ethical Issues in Research
1. Do not steal by plagiarizing or claiming the results of others.
2. Do not lie by misreporting sources or by inventing results.
3. Do not destroy sources and data for those who follow.
4. Do not submit data whose accuracy they have reason to question.
5. Do not conceal objections that they cannot rebut.
6. Do not caricature those with opposing views or deliberately state their views in a way they would reject.
7. Do not write their reports in a way that deliberately makes it difficult for readers to understand them, nor do they simplify that which is legitimately complex

3.6 Analytical Framework

The present study drew on the Hyland's (2005a) interpersonal model of metadiscourse for data analysis. There are several reasons behind this selection. First, it accounts for the Ädel's (2006) 'broad' approach for metadiscourse analysis. To add on, Ädel (2006) makes a distinction between two different approaches for metadiscourse analysis: broad and narrow. For her, the broad approach considers those language

features used for textual construction (e.g., textual functions) and those utilized for conveying writer's standings and feelings (e.g., interpersonal functions) as metadiscourse. The narrow approach, however, simply counts as metadiscourse those language devices, which serve textual functions. Second, almost all metadiscourse researchers have thus far coded and analyzed their data based on the Hyland's (2005a) taxonomy. Such an overuse reflects the point that his model is highly comprehensive, practical and plausible, especially in case of written discourse analysis. Thus, its adoption into the present research may pave the way to compare the findings of this study with earlier ones. Table 3.3 represents the Hyland's (2005a) interpersonal model of metadiscourse.

Table 3.3: Hyland's (2005a) Interpersonal Model of Metadiscourse

Category	Functions	Examples
Interactive	***Help to guide the reader through the text***	
Transitions	Express relations between main clauses	*But, thus, and*
Frame markers	Refer to discourse acts, sequences or stages	*Finally, to conclude*
Endophoric markers	Refer to information in other parts of the text	*Noted above, in section 3*
Evidentials	Refer to information from other texts	*According to x, Z states*
Code glosses	Elaborate propositional meanings	*Namely, e.g., in other words*
Interactional	***Involve the reader in the text***	
Hedges	Withhold commitment and open dialogue	*Might, perhaps, possible*
Boosters	Emphasis certainty and close dialogue	*In fact, it is clear that*
Attitude markers	Express writer's attitude to proposition	*Unfortunately, I agree*
Engagement markers	Explicitly build relationship with reader	*Consider, you can see that*
Self-mentions	Explicit reference to author(s)	*I, we, my, me, our*

Regarding the functional analysis, the data was examined following, partially, a collection of the previously identified functions (ex. Hyland, 1998; Jalilifar, 2011; Khedri, 2014, Khedri, 2016)

3.6.1 The Analytical Categories

Following the Hyland's (2005a) taxonomy of metadiscourse, the ten interpersonal metadiscourse markers built the category for analysis: *transitions*, *frame markers*, *endophoric markers*, *evidentials*, *code glosses*, *hedges*, *boosters*, *attitude markers*, *engagement markers*, *and self-mentions*. Each marker is explained bellow accompanied by examples extracted from the corpus. Illustrations of the metadiscourse devices are italicized.

According to Hyland (2005a), *Transition markers* include conjunctions and adverbial phrases and are responsible for highlighting the pragmatic connections between different stages of the text. Transition markers are characterized through lexical items like: *in contrast, however*, *likewise*, *equally*, etc.

- *On the contrary*, fixed prostheses in the maxilla are more successful than removable dentures. (I1)

- *Furthermore*, these procedures are less timeconsuming. (P3)

Code glosses, are those lexical devices responsible to provide supplementary data by means of rephrasing, elaborating or explaining the idea. Code glosses signal the writer's anticipation about the readers' level of knowledge through expressions such as *for example, this can be defined as* or punctuation marks, namely, *parenthesis* and *comma* (Hyland, 2005a).

- Today, although synthetic bone substitute materials *such as* hydroxyapatite (HA) or beta-tricalcium phosphate (b- TCP) have been … (I2)

- In ultrasonic cleaner containing cement removal agent *(Removal on-I, Premier Dental products Co, Norriston, PA)* for 30 and 15 minutes, respectively. (P4)

Endophoric markers include those linguistic features, which make reference to some parts of the propositional matter that mentioned earlier or will mention later in the discourse (Hyland, 2005a).

- The objective of *this study* was to assess if the nonremoval of abutments placed at the time of the surgery ... (I7)

- There were no statistically significant differences between groups 1 and 2 *[Table 3]*. (P6)

Evidentials point out those linguistics devices that make reference of information sources from outside the text (Hyland, 2005a).

- In *our previous publications (Roccuzzo et al. 2010, 2012)*, the implant 10-year survival rate varied from … (I8)

- The difference between the experimental and the control groups at 7-day interval were significant, consistent with *the results of other studies*. (P5)

Frame markers are those linguistic devices that highlight the boundaries of the schematic structure of the text and refer to discourse acts or stages. Various linguistic expressions such as *concerning* and *with regard to* function as frame markers in the text (Hyland, 2005a).

- *Overall*, the output torque of a surgical motor decreases gradually … (I10)
- In light of the above, *the aim of* this study was to evaluate the influence of the mandible to find … (P7)

Hedges are those linguistic devices that express probability and uncertainty about the statements. Hedges are typified in the corpus through various lexical words such as *seem, suggest, would, may, can, hypothesize, likely*, etc. (Hyland, 2005a).

- Eriksson and Adell *suggested* that bone temperature *should be* below 47C during drilling. (I10)
- It *seems* there is no study on the effects of the voxel size on measurement of mandibular thickness yet. (P7)

Opposite to the hedges, writers express certainty through *boosters* and close the discussion about the information. Lexical items such as *clearly*, *obviously* and *demonstrate* illustrate booster devices (Hyland, 2005a).

- Finally, a recent paper *demonstrated* that RFA and torque represent two different features of … (I6)

- Some studies *have shown* that ProRoot WMTA actively promotes hard tissue formation by … (P5)

Attitude markers signal the writer's affective attitude towards the propositional content. They can be illustrated through attitude verbs (e.g. *agree*, *prefer*), sentence adverbs (e.g. *unfortunately*, *hopefully*) and adjectives (e.g. *appropriate*, *logical, remarkable*) (Hyland, 2005a, p. 53).

- The measurement of the vertical distance between the implant level and the first point of contact of the bone with the implant surface gave some *encouraging* results. (I7)
- It is *expected* that conditions contributing to the behavior of an RMGI similar to … (P6)

Self-mentions signal the explicit presence of the writer in the text. Writers signal their authorial identity and credibility through linguistic devices such as first person pronouns and possessive adjectives (e.g., *I*, *my*, exclusive *we*, *our*, *ours*) (Hyland, 2005a, p. 53).

- *Our* findings also go along with the more flattened cell morphology observed in … (I9)
- *Our* results in terms of maintained marginal corroborate the long-term results of other … (I1)

3.7 Sampling Procedure

First, a list of online open access ISI international and research-based Iranian dentistry journals were provided by the researcher. Only those journals that their publication started before 2011 and continued so far were listed. From the list, two ISI English and two research-based Iranian journals were chosen randomly. Articles were basically chosen following the random stratified sampling strategy.

3.8 Instruments and Analyzing Procedure

Firstly, the selected articles were saved on the computer and the number of words was counted using Microsoft word application. The entire corpus was carefully read and analyzed manually to detect metadiscourse markers. Considering the multifunctional and context-dependent nature of metadiscourse (Ädel, 2006), functional and contextual meanings were considered to analyze the data.

Data coding procedure was done considering the Hyland (2005a) metadiscourse items' list. The researcher used color markers to code the data and specified one particular color to each metadiscourse marker. Moreover, the abbreviated names of metadiscourse markers were written above the highlighted features. All the

metadiscourse markers recognized one by one and separately. After detecting metadiscourse devices, researcher counted the markers manually for frequency analysis. As soon as frequency analysis completed, the entire corpus analyzed regarding the function of metadiscourse markers. For this purpose, the researcher read the whole corpus again and manually recognized the functions of the previously identified metadiscourse markers following a collection of the previously identified functions (ex. Hyland, 1998; Jalilifar, 2011; Khedri, 2014, Khedri, 2016)

Footnotes, linguistic examples, tables, and quotations were not included in the analysis. Due to the unequal size of the research articles in the corpus, to explore the significance of the cross-linguistic differences, the raw frequency of the employment of metadiscourse markers were normalized to a text length of 1000 words, using the following formula:

Frequency per 1000 words = (raw frequency ÷ number of words in the text) × 1000

To preclude the threat of unreliability in the analysis, to verify the interpretations, and to make the agreement on the method of analysis, a subset of the data (5 articles per dataset) was double-analyzed independently by a second rater. The inter-rater reliability index was then measured through Cohen's Kappa. The obtained Kappa value was 0.89 that indicated a high degree of agreement.

3.9 Conclusion

It is hoped that using a robust methodology can help the results to provide enough support for the arguments of the present study. The results of the study will be presented in the next chapter.

CHAPTER 4: RESULTS

4.1 Introduction

The results of the corpus analysis are illustrated in this chapter. To explore the significance of the cross-linguistic differences, the frequency rate of each marker was determined per 1000 words due to the unequal size of the data in each dataset. The current chapter first represents the size of the both sets of data, the grand total occurrence of interactive and interactional metadiscourse markers in each dataset, and the overall distribution of markers in the corpus. Next, the results of the frequency analysis of markers and their subcategories are illustrated in the separate sections. Then, the results of the functional analysis of metadiscourse markers are represented. Some examples are extracted from the corpus and presented. Illustrations of the metadiscourse markers are bolded and italicized.

4.2 Overall View of Metadiscourse

This section presents the overall frequency of metadiscourse use in the corpus under study. First, the size of the two datasets and the total size of the corpus are illustrated (see Table 4.1). Then, the results of the frequency analysis of interactive and interactional metadiscourse markers in both sets of data are pictured (consider Table 4.2)

Table 4.1: Corpus's Size

	Corpus's size
International	33156
Iranian	23764
Total	56920

Table 4.2: Distribution of Interactive and Interactional Metadiscourse Markers in the Corpus

	International		Iranian	
	Raw	**%**	**Raw**	**%**
Interactive	1648	63.9	1353	67.1
Interactional	930	36.00	663	32.7
Total	2578 (77.7 per 1000 words)	100	2016 (84.8 per 1000 words)	100
Grand total	**4594 (80.7 per 1000 words)**			

Results showed that 4594 lexical items played a metadiscoursal role in the whole corpus under study (56920 words). Regarding Table 4.2, International corpus contained 33156 words, which 2578 extracted words functioned as metadiscourse markers (77.7 instances per 1000 words). The Iranian corpus comprised 23764 words, which 2016 extracted words functioned as metadiscourse (84.8 instances per 1000 words). Considering this rate of frequency, the results indicated that Iranian writers were more eager to use interactive metadiscourse markers (67.1%) compared to their International counterparts (63.9%). Regarding the employment of interactional metadiscourse markers, findings demonstrated that International writers (36%) had more tendency to use interactional metadiscourse compared to their Iranian counterparts (32.7%). Table 4.2 also indicates that interactive metadiscourse markers were more materialized in both sets of data compared to interactional devices.

4.3 Interactive Metadiscourse Markers

This section presents the frequency and distribution of interactive metadiscourse markers in the English dentistry research articles written by International and Iranian writers.

4.3.1 Transitions

4.3.1.1 Distribution of Transitions

As it can be seen in Table 4.3, there are some similarities and differences between the two sub-corpuses regarding how the International and Iranian writers make use of transition markers in English dentistry research articles. The total frequencies indicated that Iranian writers (15.2 instances per 1000 words) used more transition markers compared to their International counterparts (13.2 instances per 1000 words).

Table 4.3: Distribution of Transitions in the Corpus

International		Iranian	
Raw	**Norm**	**Raw**	**Norm**
440	13.2	363	15.2

Table 4.4 illustrates transition markers' subcategories and their frequencies in the corpus. According to Table 4.4, transitions in the corpus are found to create 1) additives (examples 1a-1b), 2) comparatives (examples 2a-2b), and 3) consequentials (examples 3a-3b) links in the discourse. This result is in concordance with the results of the previous studies (i.e. Khedri, 2014; Khedri et al., 2013a; Mur-Duenas, 2011) on the interactive resources of metadiscourse.

Example 1a: ***Furthermore***, the application of autogenous bone is not easy in common medical offices … (I2)

Example 1b: They are ***also*** more resistant to antibiotics and agents capable of destroying planktons. (P1)

Example 2a: ***Conversely***, the smallest 3-D deviation that resulted in a clinical misfit was 59 mm. (I3)

Example 2b: ***On the other hand***, both the control and air-abraded groups had relatively smooth surfaces. (P8)

Example 3a: ***Hence***, it can be speculated that the augmented bone, irrespective of the preoperative ... (I5)

Example 3b: ***Therefore***, the guidelines issued by ADA to reduce infection risk in the elderly, organ transplant patients … (P1)

Based on Table 4.4, additive markers were the most frequent subcategory of transitions in both International and Iranian datasets. However, International writers (66.3%) have used more additive devices compared to their Iranian cognates (56.1%). International and Iranian writers used comparison devices at the same level (23.4%) while Iranian writers (20.3%) surpassed their International cognates (10.2%) in using consequence markers.

The findings also indicated that coordinating conjunctions such as *and* and *also* were the most frequent types of additive markers in both datasets. Regarding comparative devices, *however* and *but* had the highest rate of occurrence in both International and Iranian datasets. As for consequential devices, *therefore* and *thus* in International

research articles and *therefore* and *result in* in Iranian research articles were the most frequent ones.

Table 4.4: Distribution of Subcategories of Transition Markers in the Corpus

	International		Iranian	
	Raw	**%**	**Raw**	**%**
Addition	292	66.3	204	56.1
Comparison	103	23.4	85	23.4
Consequence	45	10.2	74	20.3
Total	440	100	363	100

4.3.1.2 Functional Analysis of Transitions

Results of the functional analysis of transitions in the corpus (consider Table 4.5) showed that International and Iranian dentistry writers deploy transitions to complete various communicative functions. As it is demonstrated in Table 4.5, transitions carry out four functions: 1) providing background information, by which the writer attempts to provide precise background information about the topic (examples 4a-4d); 2) linking the research design with methodological procedures, by which the writer tries to guide the readers easily grasp the information provided regarding the different steps of research practice, and explains how and why the data in her/his study is formed and manipulated (examples 5a-5d); 3) reporting and commenting on results (examples 6a-6d), through which the writer helps the reader better understand the intended interpretation, 4) referring to literature (examples 7a-7d), through which the writer refers to literature to review previous results.

Table 4.5: Functional Analysis of Transitions in the Corpus

	International		Iranian	
Function	**Raw**	**Norm**	**Raw**	**Norm**
Providing background information	74	2.2	79	3.3
Describing the methodological process	177	5.3	221	9.2
Reporting and commenting on results	134	4.0	17	0.7
Referring to literature	45	1.3	125	5.2
Total	440	13.2	363	8.6

Regarding function 1, Iranian writers (3.3 instances per 1000 words) outweighed their International cognates (2.2 instances per 1000 words) in using transitions to provide background information on the study.

Function 2, namely, describing the methodological procedures, deployed more frequently by the Iranian writers (9.2 tokens per 1000 words) compare to the International ones (5.3 tokens per 1000 words). It can be concluded that the International writers were more focused on guiding the readers to easily understand the different stages of the methodological process.

The third function of transitions in the corpus was reporting and commenting on results. This function is just served in International articles (4.0 tokens per 1000 words) and not in Iranian ones (0.7 tokens per 1000 words).

The fourth function is the employment of transitions to referring to literature. Iranian (5.2 instances per 1000 words) writers outweighed their International cognates (1.3 instances per 1000 words) in the deployment of transitions for referring to literature.

Example 4a: ***Moreover***, the implant surface should support the proliferation and the differentiation of ... (I9)

Example 4b: ***Therefore***, in the control of biofilms a general approach should be considered. (P1)

Example 4c: ***On the other hand***, RFA is measured by an electronic device... (I6)

Example 4d: RBC restorations are ***also*** more economic and cheaper than indirect restorations ... (P3)

Example 5a: ***Additionally***, the acrylic base had to be free from porosities ***and*** show well-polished surfaces. (I1)

Example 5b: ***In addition***, one-way ANOVA and a post hoc Tukey test were used to assess differences in ... (P6)

Example 5c: Membranes have not been used, ***but*** a submerged healing was intended for the implants. (I4)

Example 5d: The material was mixed, injected into the mold ***and*** then light-activated according to ... (P6)

Example 6a: ***Nevertheless***, the fact that the defects implanted with the OCP/collagen can be displayed by the ... (I2)

Example 6b: ***Therefore***, it seems that all the experimental groups in the present study could withstand the functional and ... (P3)

Example 6c: Accordingly, when a fixture is stuck in bone during surgery, it is recommended that ... (I10)

Example 6d: ***However***, there were significant differences between either the Geristore group or the ... (P5)

Example 7a: ***Moreover***, the use of new splinting materials like composition resin or light polymerizing acrylic resin resulted in better results (Del'Acqua et al. 2010). (I3)

Example 7b: ***In addition***, Godoy-Bezerra et al. reported that conditioning the enamel with 10% polyacrylic acid ... (P6)

Example 7c: It must be said, ***however***, that in a recent systematic review, prepared for the seventh European Workshop on Periodontology, Renvert et al. (2011) revealed that ... (I8)

Example 7d: Wood ***also*** conducted an animal study to determine factors affecting alveolar bone height measurements from CBCT Images. (P7)

4.3.2 Code Glosses

4.3.2.1 Distribution of Code Glosses

Code glosses are the second category to be analyzed in the area of the interactive metadiscourse markers. Table 4.6 represents the results of the frequency analysis of code gloss markers in both sets of data. As illustrated, International (12.3 tokens per 1000 words) dentistry writers surpassed their Iranian (9.6 tokens per 1000 words) peers in the deployment of code glosses.

Table 4.6: Distribution of Code Glosses in the Corpus

International		Iranian	
Raw	**Norm**	**Raw**	**Norm**
410	12.3	299	9.6

4.3.2.2 Functional Analysis of Code Glosses

As Table 4.7 illustrates, the code gloss markers in the corpus carried out two communicative functions: 1) exemplification (examples 8a-8d), and 2) reformulation (examples 9a-9d). According to the Table 4.7, reformulation and exemplification functions of code glosses were used in the same trend in International and Iranian dentistry research articles.

Table 4.7 Functional Analyses of Code Glosses in the Corpus

	International		Iranian	
Function	**Raw**	**Norm**	**Raw**	**Norm**
Exemplification	51	1.5	37	1.5
Reformulation	359	10.8	262	11.0
Total	410	12.3	299	9.6

Example 8a: The secondary outcome objectives were patient satisfaction for assessment of all functional aspects, ***such as*** phonetics. (I1)

Example 8b: Almost all these cement contain some trace elements ***like*** aluminum. (P5)

Example 8c: This value can be obtained in several ways; ***for instance***, Figure 3 shows the IT curve of an implant... (I6)

Example 8d: In routine daily practice, there are reasons for delaying light activation, ***for example***, in bracket bonding.... (P6)

Example 9a: Likewise, the percentage of remaining implant in the defect ***(r-Imp %)*** was calculated as the area of .... (I2)

Example 9b: To achieve this purpose, dental silorane-based composite resines that ***consist of*** a new organic matrix were marked. (P8)

Example 9c: The linear mixed model allows for adequate consideration of correlations in the study design, since some comparisons are within subjects ***(splitmouth)***, and others are between subjects ***(randomized)***. (I5)

Example 9d: ***In another words***, Geristore and Bioaggregate include more inflammation even after 60 days. (P5)

4.3.3 Endophoric Markers

4.3.3.1 Distribution of Endophoric Markers

Table 4.8 represents the overall distribution of endophoric markers in both datasets. As disclosed, International (7.8 tokens per 1000 words) and Iranian (8.2 tokens per 1000 words) dentistry writers presented a similar trend in patterning the endophoric markers.

Table 4.8: Distribution of Endophoric Markers in the Corpus

International		Iranian	
Raw	**Norm**	**Raw**	**Norm**
261	7.8	197	8.2

Moreover, findings showed that endophoric markers in the corpus could be categorized into two categories. Table 4.9 illustrates the subcategories of endophoric markers in both datasets. The first subtype is forward/backward referencing through expressions such as *Table x*, *Figure x* (see examples 10a-10b). The second subtype is inward referencing, which includes the references to the text itself and is done via patterns such as *this study*, *present study*, etc. (see examples 11a-11b). This result is compatible with Khedri's (2014) study. A more precise glance at the results showed that inward endophoric markers were more frequent in both International and Iranian research articles. Moreover, inward referencing was more frequent in Iranian articles (67%) compared to International ones (53.2%). In contrast, International writers (46.7%) used forward/backward devices more than their Iranian counterparts (32.9%).

Table 4.9: Distribution of Subcategories of Endophoric Markers in the Corpus

	International		**Iranian**	
	Raw	**%**	**Raw**	**%**
Forward/ backwards	122	46.7	65	32.9
Inwards	139	53.2	132	67.00
Total	261	100	197	100

Example 10a: The absolute values of the discrepancies (mean, SD and range) in x-axes, y-axes, z-axes and the total 3-D are presented in ***Table 1***. (I3)

Example 10b: The exposed fiber surface was also filled with composite resin (***Figure 1A***) (P3)

Example 11a: The major goal of ***this study*** was to evaluate cell adhesion on a hydrophilic surface.... (I9)

Example 11b: Therefore, the aim of ***the present study*** was to investigate the effect of delayed irradiation and/or preconditioning of ... (P6)

4.3.3.2 Functional Analysis of Endophoric Markers

Based on the functional analysis, endophoric markers in the corpus served three functions. The first function was presenting the study, through which the writer states the goals, significance, and limitations of the study (see examples 12a-12b). The second function was delineating research designs and methodological process (see examples 13a-13b), and the third one was stating findings of the study (see examples 14a-14b). Table 4.10 presents the results of the functional analysis of endophoric markers in the corpus. As Table 4.10 shows, the communicative function of stating findings accounted for the majority of endophoric markers usage in the corpus, and both International (3.8 instances per 1000 words) and Iranian (4.6 tokens per 1000 words) writers showed similar tendency to use endophoric markers for stating their findings. As for the function of presenting the work, International writers used few instances of the endophoric devices for such a purpose, while Iranian writers did not employ endophoric markers for presenting their study and informing the readers about goals, significance, and limitations of the study. Regarding the function of delineating research designs and methodological process, again, both International (2.5 tokens per 1000 words) and Iranian (1.6 tokens per 1000 words) writers showed similar tendency to use endophoric markers for describing the design and methodological process of the research.

Table 4.10: Functional Analysis of Endophorics in the Corpus

	International		Iranian	
Function	**Raw**	**Norm**	**Raw**	**Norm**
Present the work	38	1.1	28	0.6
Delineating research designs and methodological process	84	2.5	59	1.6
Stating findings	139	3.8	110	4.6
Total	261	7.8	197	8.2

Example 12a: The objective of ***this study*** was to assess if the nonremoval of abutments placed at the time of the surgery ... (I7)

Example 12b: Therefore, the aim of the ***present study*** was to compare the effect of three mechanical surface treatment modalities... (P8)

Example 13a: OCP was prepared by mixing a calcium and phosphate solution as ***described previously***. (I2)

Example 13b: Only active units with working water/air syringes and handpiece outlets were included in ***the study***. (P1)

Example 14a: The distribution of the implant location in the upper and the lower jaw was very homogeneous ***(Table 1)***. (I5)

Example 14b: The results of the ***present study*** showed a low bond strength value for delayed ... (P6)

4.3.4 Evidentials

4.3.4.1 Distribution of Evidentials

Table 4.11 shows the results of the frequency analysis of evidential markers in both sets of data. According to the table, Iranian dentistry writers (16.00 tokens per 1000 words) were more tend to use evidentials compared to their International cognates (11.00 tokens per 1000 words).

Table 4.11: Distribution of Evidentials in the Corpus

International		Iranian	
Raw	**Norm**	**Raw**	**Norm**
365	11.00	382	16.00

Moreover, the recognized subcategories for evidential markers in the corpus and their frequencies of occurrence are pictured in Table 4.12. Regarding the Table 4.12, evidential markers in the corpus could be categorized into two main groups, namely, *Personal* and *Impersonal* citations. Personal devices refer to citing an outsource information by mentioning the name of the author and the date in the sentence itself or at the end of the sentences with using parenthesis (examples 15a-15b). In contrast, by using linguistic expressions like *the study*, *the author*, *the researchers*, etc. (examples 16a-16b) writers impersonally cite an outsource information in their texts. The results are in line with the studies of Khedri (2014) and Mur-Duenas (2011).

Example 15a: The original study population consisted of 72 patients as described in a previous study ***(Zitzman et al., 2001)***. (I5)

Example 15b: In addition, ***Navimipour et al*** demonstrated that the surface treatment of resin modified glass-ionomer with Er,Cr:YSGG laser increased the bond strength of ... (P8)

Example 16a: ***Other studies*** have evaluated the accuracy of the implant impressions by measuring interimplant distances of working casts ... (I3)

Example 16b: The results of ***some studies*** have shown moderate to severe reactions to ProRoot WMTA. (P5)

A more precise look reveals that impersonal devices were more frequent in both datasets, and Iranian (87%) writers had more tendency to use impersonal devices in their texts compared to the International writers (60%). In contrast, International (40%) writers outweighed their Iranian (12%) cognates in using personal devices.

Table 4.12: Distribution of Subcategories of Evidential Markers in the Corpus

	International		Iranian	
	Raw	**%**	**Raw**	**%**
Personal	146	40	46	12
Impersonal	219	60	336	87
Total	365	100	382	100

4.3.4.2 Functional Analysis of Evidentials

As Table 4.13 pictures, evidentials served three communicational functions in the corpus. First, writers used evidentials for signaling reasonable basis and foundation for

the study (see examples 17a-17d). As Table 4.13 shows, Iranian (5.8 tokens per 1000 words) writers, compared to their International peers, were more eager to recount earlier findings in order to convince the readers about the robust research foundation. This is the second frequent communicative function of evidentials in the corpus.

Example 17a: In a 3year follow-up report by ***Hutton et al. (1995)***, the implant failure rate in cases of mandibular implant-supported overdentures was 3.3% ... (I1)

Example 17b: Based on the ***results of some recent studies*** the acid-base and photo-initiated free-radical reactions have a reciprocal ... (P6)

Example 17c: We established ***a method of OCP synthesis in 1991*** on a relatively large scale and found ... (I2)

Example 17d: based on the results of ***some recent studies*** the acid-base and photo-initiated free-radical reactions have a reciprocal inhibitory ... (P6)

Second, writers employed evidentials to explain and justify experimental procedures of the study or previous ones (examples 18a-18d). This is the least interesting function of evidentials in the corpus and used in a similar manner by International (1.9 tokens per 1000 words) and Iranian (1.4 tokens per 1000 words) dentistry writers.

Example 18a: All implants were placed using a standardized surgical procedure ***(Buser et al. 2000). (***I8)

Example 18b: This technique was introduced by ***Torneck in 1966*** and confirmed by ***Olsson et al in 1981***. (P5)

Example 18c: ***Our previous study*** showed that such heating does not affect physical properties... (I2)

Example 18d: ***Mann-Whitney test*** with a ***Bonferroni adjusted significance level*** of 0.001 was used ... (P4)

Lastly, authors used evidentials to support the new findings of their studies (examples 19a-19d). This is the most common function of evidentials in both International and Iranian dentistry articles. According to the results, Iranian dentistry writers (8.8 tokens per 1000 words) showed more interest to bring in intertexual support for proving the authenticity and validity of their new knowledge compared to their International cognates (5.8 tokens per 1000 words).

Example 19a: ***Previous in vitro studies*** comparing splinted with non-splinted impression techniques ... (I3)

Example 19b: In a study on titanium copings over short ITI . (P4)

Example 19c: In ***the review from 2002***, the survival rate of implants placed into sites with augmented ... (I5)

Example 19d: ***Kamburoglu et al.*** assessed the effect of CBCT voxel size (0.1 mm, 0.2 mm, and 0.3 mm) on the diagnosis of occlusal caries. (P7)

Table 4.13: Functional Analysis of Evidentials in the Corpus

	International		Iranian	
Function	**Raw**	**Norm**	**Raw**	**Norm**
Signaling reasonable foundation	105	3.1	138	5.8
Explaining and justifying experimental procedures of the present study or previous ones	66	1.9	34	1.4
Intertextual support for new knowledge	194	5.8	210	8.8
Total	365	11.00	382	16.00

4.3.5 Frame Markers

4.3.5.1 Distribution of Frame Markers

Table 4.14 illustrates the frequencies of the fifth category of the interactive metadiscourse markers, namely, frame markers, in both sets of data. The findings showed that International and Iranian dentistry writers deployed frame markers in a similar pattern.

Table 4.14: Distribution of Frame Markers in the Corpus

International		Iranian	
Raw	**Norm**	**Raw**	**Norm**
172	5.1	112	4.7

4.3.5.2 Functional Analysis of Frame Markers

As Table 4.15 shows, frame markers served four communicative functions in the corpus: 1) sequencing the ideational meaning (examples 20a-20b), 2) announcing the goals and scope of the study (examples 21a-21b), 3) labeling stages of the text (examples 22a-22b), and 4) indicating shift in the topic (example 23a). Results revealed that International and Iranian writers behaved similarly in fulfilling these four functions, except that Iranian writers did not use frame marker devices to indicate the shift in the topic (less than one token per 1000 words).

Example 20a: Patients were not accepted into the study if they met any of the following exclusion criteria: ***1)*** active infection … ***2)*** systematic disease … ***3)*** treatment with radiation … (I7)

Example 20b: In this study application of circumferential and occlusal fibers led to … which can be explained from two accepts. ***First***, according to levers principle the anchorage... ***Second***, in these biaxially braided fibers … (P3)

Example 21a: The ***aim*** of this study was to investigate whether appropriately designed, screw-retained, full-arch prostheses retained by…. (I1)

Example 21b: The teeth were stored in 0.2% thymol solution … and used for the purpose of the present study after informed patient consent was obtained… (P6)

Example 22a: ***In brief***, the implant site was prepared according to standard protocols for the …. (I5)

Example 22b: ***Summarily***, 5the various chemical components of complex materials such as RMGIs might give rise to diverse clinical behaviors. (P6)

Example 23a: ***Coming back to our example***, the VTW of the first curve is 726 Ncm… (I6)

Table 4.15: Functional Analysis of Frame Markers in the Corpus

	International		Iranian	
Function	**Raw**	**Norm**	**Raw**	**Norm**
Sequencing	51	1.5	32	1.3
Announcing goals	37	1.1	33	1.3
Labeling stages	42	1.2	24	1.0
Shifting in topic	42	1.2	23	0.7
Total	172	5.1	112	4.7

4.4 Interactional Metadiscourse Markers

This section presents the frequency and function of the interactional metadiscourse markers in the corpus.

4.4.1 Hedges

4.4.1.1 Distribution of Hedges

Table 4.16 illustrates the results of the frequency analysis of the first category of interactional markers, namely, hedges in the corpus. Findings showed that Iranian dentistry writers (12.8 tokens per 1000 words) use more hedging devices compared to International writers (10.2 tokens per 1000 words). In other words, Iranian writers had more tendency to moderate assertions through using hedging devices in their writings compared to their International counterparts

Table 4.16: Distribution of Hedges in the Corpus

International		Iranian	
Raw	**Norm**	**Raw**	**Norm**
339	10.2	306	12.8

Results also indicated that hedges in the corpus can be categorized into six categories (see Table 4.17): 1) modal auxiliary verbs (hereafter Modaux) such as *may, might, should, can, could, would*; 2) epistemic verbs like *seem, suggest, claim*; 3) epistemic nouns such as *probability, hypothesis*; 4) epistemic adverbs like *sometimes*, *likely*; and 5) approximators like *any*, *few*. These results are in line with Khedri's (2014) study.

According to Table 4.17, modaux were the most frequent hedging device in both International (43%) and Iranian (53.5%) dentistry articles, followed by epistemic verbs (28% in International and 23.5% in Iranian articles). Clauses (2.6% in International and

3.5% in Iranian articles) were the least frequent type of the hedging markers in both datasets.

Table 4.17: Distribution of Subcategories of Hedges in the Corpus

	International		Iranian	
	Raw	**%**	**Raw**	**%**
Modaux	146	43	164	53.5
Epistemic verbs	95	28	72	23.5
Epistemic nouns	23	6.7	16	5.2
Epistemic adverbs	38	11.2	20	6.5
Approximators	28	8.2	23	7.5
Clauses	9	2.6	11	3.5
Total	339	100	306	100

4.4.1.2 Functional Analysis of Hedges

Table 4.18 pictures the results of the functional analysis of hedges in the corpus. As results demonstrate, International and Iranian dentistry writers deployed hedging devices to fulfill four communicative functions. First, they hedged their discourse to make assumptions about the nature of the topic and share some details about the topic with their readers (examples 24a-24d). According to Table 4.18, this function is not realized in the International corpus (0.6 is less than 1).

Example 24a: Implant retained maxillary overdentures ***seem*** to be affected most frequently. (I1)

Example 24b: In such applications, RMGIs ***should*** form an effective bond to tooth structure with the use of dental adhesives ... (P6)

Example 24c: Frictional heat from bone drilling ***can*** cause thermal necrosis of bone.

Example 24d: Retrievability ***may*** be a critical aspect of implant-supported restorations because of ... (P4)

Second, they featured hedges for making reference to the existing literature (examples 25a-25d). Iranian writers were more eager to tentatively report previous works and their findings (2.1 tokens per 1000 words) compare to their International peers (1.6 tokens per 1000 words).

Example 25a: The investigators ***observed*** active secretion of osteoblasts in the coronal part of the alveolar … (I4)

Example 25b: It has recently been ***hypothesized*** that delayed polymerization of RMGIs will improve … (P6)

Example 25c: Moreover, the implant surface ***should*** support the proliferation and the differentiation of osteogenic cells into mature osteoblasts (Martin et al. 1995; Lossdorfer et al. 2004; Qu et al. 2007) (I9)

Example 25d: Recently, a study showed that enamel bond strength of an RMGI restoration ***might*** improve by delaying the light activation ... (P6)

Third, writers employ hedging devices to share their knowledge of research designs and methodological approaches with their readers (examples 26a-26d). As Table 4.18 shows, International (1.4 tokens per 1000 words) and Iranian (1.4 tokens per 1000 words) writers had similar tendency to share their methodological knowledge with their readers.

Example 26a: The final restorations were delivered ***approximately*** 6 months after implant insertion. (I7)

Example 26b: In the present research 37% phosphoric acid was used for 20 s for conditioning the enamel surfaces so that ***it would be possible to*** directly compare it with 20% polyacrylic acid … (62)

Example 26c: Repetitive measurements for all casts ***can*** provide a threshold of clinically acceptable misfit. (I3)

Example 26d: Using water bath ***may*** cause problems for positioning, and ***may*** damage dry mandibles. (P7)

The last communicative function of the hedges in the corpus refers to interpreting and commenting on the results of the study (examples 27a-27d). While this is the most dominant function of hedges in both International and Iranian datasets, Iranian (7.4 tokens per 1000 words) writers exceeded their International peers (6.4 tokens per 1000 words) in this regard.

Example 27a: This difference in the congruency between the threads and the bone preparation shown by the histological; samples ***could*** also explain ***some*** of the unexpected data presented in Table 2. (I6)

Example 27b: … and a 0.3 mm voxel ***appeared*** to be the best protocol… (P7)

Example 27c: Furthermore, considerable confusion in the definition itself of IT ***can*** be found in scientific literature. (I6)

Example 27d: Therefore, the results ***indicate*** that generally, RMGIs do not achieve sufficient and strength without light-initiated resin polymerization, refuting the null ***hypothesis*** of this study. (P6)

Table 4.18: Functional Analysis of Hedges in the Corpus

	International		Iranian	
Function	**Raw**	**Norm**	**Raw**	**Norm**
Making assumptions about topic	20	0.6	42	1.7
Referring to literature	56	1.6	51	2.1
Sharing their knowledge of research designs and methodological approaches	49	1.4	35	1.4
Interpreting and commenting on results	214	6.4	178	7.4
Total	339	10.2	306	12.8

4.4.2 Boosters

4.4.2.1 Distribution of Boosters

Results of the frequency analysis of boosters - the second category of interactional metadiscourse markers to be analyzed - are pictured in Table 4.19. As disclosed, International dentistry articles (16.8 tokens per 1000 words) contained more boosters compared to Iranian ones (14.3 tokens per 1000 words).

Table 4.19: Distribution of Boosters in the Corpus

International		Iranian	
Raw	**Norm**	**Raw**	**Norm**
559	16.8	342	14.3

Moreover, results indicated that International and Iranian dentistry writers boost their propositional matter through various linguistic features (see Table 4.20): 1) lexical adverbs such as *effectively, indeed, clearly, strongly*, etc.; 2) lexical verbs like *establish, evidenced, find, show, determine,* etc.; 3) lexical nouns such as *fact, evidence, significance*, etc.; 4) modal auxiliary verb (Modaux), for example, *will, have to*, *must*, etc.; 5) quantifiers like *all*, *significantly*, *particularly*, etc.; 6) clauses like *it is important*

to, *it must be highlighted that*, *it is an established fact that* etc.; and, 7) superlative adjectives such as *the most significant*, *the most accurate*, etc.

As Table 4.20 illustrates, quantifiers (41.3% in International and 28% in Iranian articles) and lexical verbs (43.8% in International and 55.2% in Iranian articles) were the most frequent subcategories of boosters in the International and Iranian articles. As demonstrated, International writers outweighed their Iranian counterparts in the deployment of quantifiers while Iranian writers surpassed their International peers in the employment of lexical verbs.

Table 4.20: Distribution of Subcategories of Boosters in the Corpus

	International		Iranian	
	Raw	**%**	**Raw**	**%**
Lexical verbs	245	43.8	189	55.2
Lexical adverbs	35	6.2	19	5.5
Lexical nouns	11	1.9	8	2.3
Modaux	14	2.5	9	2.6
Quantifiers	231	41.3	96	28.00
Clauses	9	1.6	7	2.00
Superlative adjectives	14	2.5	14	4.00
Total	559	100	342	100

4.4.2.2 Functional Analysis of Boosters

As Table 4.21 pictured, boosters served four communicational functions in the corpus. As for the first function (examples 28a-28d), writers used booster devices for delineating the existing literature and underlining the findings of previous studies in order to justify their study and convince the readers about the robust basis of the subject

under research. As disclosed in Table 4.21, Iranian dentistry writers surpassed their International peers in using boosters to help the readers understand the extant literature.

Example 28a: Gallucci et al. (2009) ***have concluded*** that fixed-implant prostheses in the edentulous maxilla are ... (I1)

Example 28b: A study ***showed*** that enamel bond strength of an RMGI restoration might improve by delaying the light activation procedure ... (P6)

Example 28c: ***In fact***, direct evidence of the of the presence of OCP ***was found*** in the central part of human ... (I2)

Example 28d: MTA ***has been demonstrated*** to be non-toxic toward living tissues in many investigations ... (P5)

The second function of the boosters in the corpus was to highlight the accuracy, dependency, and preciseness of the exploited methodology in the research (examples 29a-29d). As Table 4.21 shows, Iranian dentistry writers (3.4 instances per 1000 words) were more in favour of this function compared to International writers (5.2 instances per 1000 words).

Example 29a: The study protocol ***was approved*** by the ethics committee for clinical studies of the Medical Faculty ... (I1)

Example 29b: White lesions ***detected*** clinically as leukoplakia, with historical ***evidence*** of epithelial ... (P6)

Example 29c: The absolute deviations (Ncm) of the torque from the baseline ***were determined*** in the order of ... (I10)

Example 29d: KruskalWallis test ***revealed*** a significant difference between the retentive values of the ... (P4)

The third function of certainty markers in the corpus was to emphasize on research outcomes (example 30a-30b). As Table 4.21 pictures, the main purpose of using boosters in both International and Iranian dentistry articles was to make decisive claims on results. From the Table 4.21, it can be concluded that International writers were more disposed towards presenting their personal interpretations explicitly.

Example 30a: The analysis of marginal bone-level data with respect to implant length in this study ***demonstrated*** that shorter implants involve no higher bone loss than longer implants. (I1)

Example 30b: ... the present study ***confirmed*** that inflammation in the BioAggregate group was more severe or equal to the Geristore group, ***especially*** at 7-, 14- and 28-day intervals... (P5)

Example 30c: Between groups analyses ***showed*** that the three groups had a similar output torque in the repeat count of a 40 Ncm input torque. (I10)

Example 30d: The results of the present study ***showed*** a low bond strength value for delayed light ... (P6)

As for the fourth function, writers deploy boosters for underscoring and underlining previous results with the purpose of supporting their own study (examples 31a-31d). According to Table 4.21, International and Iranian writers showed a similar trend in using boosters to fulfill such a communicative function.

Example 31a: Other studies **showed** better results with the non-splinted technique, whereas several others ***have shown*** no difference. (I3)

Example 31b: This finding is consistent with a previous study that ***demonstrated*** glass ionomer cement ***showed*** significantly lower retention than zinc phosphate ... (P4)

Example 31c: It must be said, however, that an unequivocal distinction between severe and aggressive periodontitis is very difficult in the clinical practice (Picolos et al. 2005) (I8)

Example 31d: ***It is well-known that*** spatial resolution of the image is inversely correlated with the voxel dimension and ... (P7)

Table 4.21: Functional Analysis of Boosters in the Corpus

	International		Iranian	
Function	**Raw**	**Norm**	**Raw**	**Norm**
Understanding extant literature	54	1.6	60	2.5
Bolding the accuracy and preciseness of exploited methodology	175	5.2	83	3.4
Emphasizing research outcomes	243	7.3	129	5.4
Boosting previous results	87	2.6	70	2.9
Total	559	16.8	342	14.3

4.4.3 Attitude Markers

4.4.3.1 Distribution of Attitude Markers

Attitude markers are the third category to be analyzed in the area of interactional metadiscourse markers. Table 4.22 illustrates the results of the frequency analysis of the attitude markers in both International and Iranian dentistry research articles. As disclosed, only a few occurrences of this device were found in both sets of data (less than 1 instances per 1000 words considered as 0 instances in this study).

Table 4.22: Distribution of Attitude Markers in the Corpus

International		Iranian	
Raw	**Norm**	**Raw**	**Norm**
2	0.06	5	0.2

4.4.4 Engagement Markers

4.4.4.1 Distribution of Engagement Markers

Table 4.23 presents the overall distribution of engagement markers in the International and Iranian dentistry research articles. From the Table 4.23, neither the International nor the Iranian dentistry writers employed engagement markers in their articles.

Table 4.23: Distribution of Engagement Markers in the Corpus

International		Iranian	
Raw	**Norm**	**Raw**	**Norm**
4	0.1	1	0.04

4.4.5 Self-mentions

4.4.5.1 Distribution of Self-mentions

The results of the frequency analysis of self-mention markers are illustrated in Table 4.24. As disclosed, both International and Iranian dentistry writers were unwilling to use self-mentions in their articles (less than 1 instances per 1000 words considered as 0 instances in this study).

Table 4.24: Distribution of Self-mentions in the Corpus

International		Iranian	
Raw	**Norm**	**Raw**	**Norm**
26	0.7	9	0.3

CHAPTER 5: DISCUSSION

5.1 Introduction

As mentioned in chapter 1, the current contrastive study is an attempt to achieve two main goals. The first objective of this investigation is to look at the similarities and differences between the types and the frequencies of metadiscourse markers used in English dentistry research articles written by International and Iranian writers to see if Iranian authors stick to their own native norms, which reflect their cultural identity, or follow the discourse-oriented norms and conventions when they write in English. The second objective of this study targets at exploring the factor(s) (discourse functions) contributing to the use of metadiscourse in both contexts. To achieve the above-mentioned objectives, a corpus of 20 research articles (10 from each context) was put under contextual analysis adopting the Hyland (2005a) model of metadiscourse. This chapter will answer the two research questions of the present study:

1- What are the similarities and differences between the types and the frequencies of metadiscourse markers used in English dentistry research articles written by International and Iranian writers?
2- What are the functions of metadiscourse markers in English dentistry research articles written by International and Iranian dentistry writers?

5.2 Similarities and Differences between the Type and Frequencies of Metadiscourse Markers in the Corpus

This chapter will answer the first question of the present study "what are the similarities and differences between the types and the frequencies of metadiscourse markers used in English dentistry research articles written by International and Iranian writers?". This chapter first discusses the overall deployment of metadiscourse devices

in both sets of data. Next, the overall distribution of each marker will be discussed separately.

5.2.1 Overall Distribution of Metadiscourse

As mentioned in the previous chapter (see section 4.2), generally, Iranian dentistry writers (84.8 instances per 1000 words) surpassed their International (77.7 instances per 1000 words) cognates in the deployment of metadiscourse devices.

In case of interactive metadiscourse, findings demonstrated that Iranian (67.1%) writers used more of interactive devices compared to International (63.9%) dentistry writers. This shows that Iranian writers place a premium on textuality and therefore, the Persian language is considered less reader oriented compared to the English language. In the study of Rahimpour and Faghih (2009), it was shown that when Iranian write in Persian (51.1%) language, they use more interactive devices compared to their English counterparts (48.9%) and they preserve such a style of writing when they write in English (40.6% and 59.4% in native and non-native English, respectively). In the same vein, Zarei and Mansoori (2007, 2011) found that Iranian writers use more interactive devices when they write in Persian language. It can be concluded that Iranian writers follow their Persian style of writing when it comes to English writing. These results support the interlingual rhetoric differences concerning the deployment of metadiscourse devices to retain solidarity with readers while expressing the intended ideas (Mauranen, 2001; Valero-Graces, 1996; Blagojevic, 2004).

As for the deployment of interactional metadiscourse devices, findings showed that International (36%) dentistry writers were more eager to use interactional devices compared to Iranian (32.7%) ones. It can be concluded that International dentistry writers have more tendency to involve the readers in the text and create a close relationship with them. Previous studies on comparing and contracting native English

and native Iranian articles (Abdi 2009; Zarei and Mansoori 2007, 2011) demonstrated that Iranian writers use fewer instances of interactional devices compared to English writers. It seems Iranian writers follow the same habit of deploying interactional markers when they write in in English. The results of the study by Rahimpour & Faghih (2009), which compared and contrasted the native and non-native (Iranian) English articles confirm this idea.

Results also indicated that interactive metadiscourse markers were more deployed in both sets of data compared to interactional devices. Such a result signals the supremacy of textual congruency over creating explicit interactional links with the readers for both International and Iranian writers in the academic genre and besides, highlights the fact that both International and Iranian dentistry writers are very concerned with guiding the readers through the text and present a coherent and understandable piece of writing. These results are compatible with previous findings (i.e. Mirhashemi, 2013; Rahimpour & Faghih, 2009; Zarei & Mansoori; 2007).

5.2.2 Interactive Metadiscourse

This section discusses the results of frequency analysis of the interactive metadiscourse markers in the corpus.

5.2.2.1 Transitions

According to Hyland (2005a), transitions are the first type of interactive metadiscourse, which includes conjunctions and adverbial phrases. Writers use transitions to pragmatically specify different stages of the text and help the readers understand the discourse. Based on their semantic functions, there are 3 subtypes of transition markers, namely, *Additives*, *Comparatives*, and *Consequential* elements (Hyland, 2005a). Additive markers are responsible for adding elements to the discourse, such as *moreover*, *furthermore*, *and*. Comparatives demonstrate the similarity (*likewise,*

equally, etc.) or differences (*in contrast*, *however*, etc.) of arguments. Consequential elements help the reader to understand the approval (*likewise*, *equally*, etc.) or rejection (*admittedly*, *anyway*, etc.).

Similar to study by Cao and Hu (2014), transitions are limited to the inter-sentential devices in this study since intra-sentential connectors like *because*, *although* and *since* are mainly employed for syntactic purposes.

According to the results (refer to section 4.3.1.1, chapter 4), Iranian (15.2 instances per 1000 words) dentistry writers slightly exceeded their International (13.2 instances per 1000 words) counterparts in the deployment of transition markers. It shows that the Persian language is slightly more reader-oriented and Iranian writers are more focused on shaping a more coherent and comprehensible text and help the readers understand the propositional matter. They do not put the responsibility of recognizing pragmatic links between different stages of discourse on the shoulders of readers. These results are in concordance with the previous studies (Attaran, 2014; Bahrami, 2012; Zarei & Mansoori, 2007) which indicate that Iranian writers are more tend to use transition markers compared to International ones.

Results also indicated that transition markers in the corpus could be categorized in 3 sub-categories: *Additives* (see examples 1a-1b, chapter 4), *comparatives* (see examples 2a-2b, chapter 4), and *consequentials* (see examples 3a-3b, chapter 4). Regarding Additives, the results showed that International (66.3%) writers used more additive devices compared to their Iranian (56.1) pairs. According to the results, International and Iranian dentistry writers used comparison devices in a similar way (23.4%). Hyland (2004, p. 138) states that comparative devices help writers "to maneuver themselves into line with what they expect reader may think to head off objections or counterclaims". With comparative devices, writers attempt to gain more acceptances of

readers on their perspectives. As for the third category of transitions, Iranian dentistry writers (20.3%) exceeded their International cognates in the deployment of consequence devices. It can be concluded that Iranian dentistry writers are more concerned about guiding the readers through consequential connections between different stages of the discourse.

It seems that International and Iranian dentistry writers follow the similar pattern of using transitions in the corpus. In case of the deployment of subcategories of transitions, International writers used more additive devices compared to their Iranian cognates. Regarding comparative devices, International and Iranian dentistry writers followed the similar pattern in using additives and comparatives but Iranian writers used consequentials twice more than International writers. The most frequent subcategory of transitions was additive devices in International and consequential devices in Iranian articles. It seems Iranian writers should be more careful in the employment of additives and consequential devices in their articles. They should deploy more instances of additives and fewer instances of consequential devices to follow the International writers' pattern of using subcategories of transitions.

5.2.2.2 Code Glosses

The second category of interactive metadiscourse, namely code glosses, are those lexical devices responsible to provide supplementary data by means of rephrasing, elaborating or explaining the idea. This additional information helps the readers to better grasp the argument (Hyland, 2005a). Code glosses signal the writer's anticipation about the readers' level of knowledge through expressions such as *for example, this can be defined as* or punctuation marks, namely, *parenthesis* and *comma*.

Frequency analysis (consider section 4.3.2.1, chapter 4) revealed that International writers (12.3 instances per 1000 words) used slightly more code glosses compared to

Iranian (9.6 instances per 1000 words) ones. It can be concluded that International writers are moderately more concerned with providing explicit information and avoid vague propositional matter compared to Iranian writers. They provide slightly more explicit information by describing or adding more details to enable the readers recognizing the intended meaning. Therefore, Iranian writers are supposed to use moderately more code glosses to be the follower of International writers' pattern in using code glosses. These results are in concordance with the study of Attaran (2014).

5.2.2.3 Endophoric Markers

Endophoric markers include those linguistic features, which make reference to some parts of the propositional matter that mentioned earlier or will mention later in the discourse. Writers employ endophoric markers to direct the readers towards the information presented in another part of a piece of writing.

Based on the results presented earlier, International (7.8 instances per 1000 words) and Iranian (8.2 instances in 1000 words) dentistry articles presented a similar trend in the deployment of endophoric markers and ensure that readers can better refer to the different parts of the discourse. Mirhashemi (2013) and Zarei and Mansoori (2011) also did not find any significant difference in the use of endophoric devices between English and Iranian research articles.

According to the results (refer to section 4.3.3.2, chapter 4), endophoric markers in the corpus can be categorized into two categories, namely, *forward/backward* (see examples 10a-10b, chapter 4) and *inward* (see examples 11a-11b, chapter 4) devices. As mentioned in chapter 4, inward referencing devices were more frequent in both sets of data compared to forward/backward devices while Iranian (67%) writers surpassed their International (53.2%) pairs in the deployment of such devices. It seems that Iranian writers have the inclination to introduce their study and compare their work with the

related literature through expressing the aims and focuses of the study. As for forward/backward devices, International writers (46.7%) exceeded Iranian writers (32.9%) in the employment of such devices. It implies that International writers are more focused on guiding the readers through making references inside the text. Moreover, International articles may contain more tables, figures or graphs, so writers need to use more inward devices to make reference to them.

It can be concluded that Iranian writers should use more forward/backward and less inward devices to keep the balance of the subcategories of endophoric devices in their articles.

5.2.2.4 Evidentials

Evidentials point out those linguistics devices that make reference of information sources from outside the text (Hyland, 2005a). Mentioning those outside sources, writers highlight the disciplinary orientation and besides, they note that their statements are a reaction to previous statements, and their statements are also open to receive statements from others (Hyland, 2005a).

Frequency analysis (refer to section 4.3.4.1, chapter 4) showed that Iranian writers (16.00 tokens per 1000 words) were more eager to credit their propositional information by citing the outside sources compared to their International cognates (11.00 tokens per 1000 words). It can be concluded that Iranian dentistry writers sense a stronger obligation to provide support for their subject matter and convince their readers that they are familiar enough with the related literature.

Moreover, results revealed that evidentials in the corpus could be categorized into two main groups, namely, personal (see examples 15a-15b, chapter 4) and impersonal (see examples 16a-16b, chapter 4) citation devices. Personal devices refer to citing an

outsource information by mentioning the name of the author and the date in the sentence itself or at the end of the sentences with using parenthesis. In contrast, by using linguistic expressions like *the study*, *the author*, *the researchers*, etc. writers impersonally cite an outsource information in their texts. Results indicated that there was a significant difference in using evidentials between International and Iranian dentistry articles. While the personal devices were more frequent in both datasets, International writers used much more of such a device in their articles. In case of impersonal citation devices, Iranian writers surpassed their International cognates in using these devices. Iranian writers should be more careful in using subcategories of evidentials. In other words, they should use significantly more personal and less impersonal citation devices in their articles.

5.2.2.5 Frame Markers

Frame markers are those linguistic devices that highlight the boundaries of the schematic structure of the text and refer to discourse acts or stages (Hyland, 2005a). By employment of frame markers, writers help the readers to understand the organization of the text, hence, increase the explicitness of the propositional content. Various linguistic expressions such as *concerning* and *with regard to* function as frame markers in the text.

The earlier frequency analysis (see section 4.3.5.1, chapter 4) presented a similar trend of using frame markers in both sets of data. It means that the explicit organization of the text and classify it to consistent pieces has similar importance for International and Iranian dentistry writers. Zarei and Mansoori (2011) also found no significant differences in the deployment of frame markers between International and Iranian research articles.

5.2.3 Interactional Metadiscourse Markers

The current section investigates the frequency and distribution of interactional metadiscourse markers in the corpus.

5.2.3.1 Hedges

By definition, hedges are those linguistic devices that express probability and uncertainty about the statements. Hedging is of central importance in the academic genre since there is a need to cautiously express unassessed new ideas, and writers are responsible for conveying their degree of commitment about any argument. In other words, hedging is defined by the absence of certainty and commitment of the writer about the stated ideas (Hyland, 1998). Hedging devices enable writers to express epistemic modality and decrease the illocutionary force of speech act on account of politeness (Holmes, 1988). Hedges are typified in the corpus through various lexical words such as *seem, suggest, would, may, can, hypothesize, likely*, etc.

According to the results of frequency analysis (see section 4.4.1.1, chapter 4), Iranian writers (12.8 tokens per 1000 words) slightly surpassed their International peers (10.2 tokens per 1000 words) in the deployment of hedging devices. It seems that Iranian writers are moderately more concern with leaving an open space for the possible opposite results compared to their International cognates. This result is compatible with some of the previous studies (Atai and Sadr, 2006; Attaran, 2014).

Based on the disclosed results, hedges in the corpus can be divided into six subcategories: 1) Modaux, 2) epistemic verbs, 3) epistemic nouns, 4) epistemic adverbs, 5) approximators, and 6) clauses. The most frequent type of hedges in the corpus were Modaux in both International (43%) and Iranian (53.55) datasets while Iranian writers used more modaux as hedges compare to their International peers. The second frequent subcategories of hedges in both datasets were epistemic verbs. The third frequent

subcategories of hedges were epistemic adverbs in the International and approximators in the Iranian dentistry articles. It seems that Iranian dentistry writers should use less modaux and more epistemic adverbs in their dentistry articles.

5.2.3.2 Boosters

By definition, boosters are those linguistic devices that "give emphasis to writers' confidence" (Khedri, 2014) and express the certain statements of the writers. Through boosters, writers signal their commitment to the truth of their statement and besides, they express that there is no space for alternative ideas by highlighting their assurance about the statement. Various linguistic expressions such as *show*, *the highest*, *particularly,* etc. can function as boosters.

The frequency analysis of the corpus (see section 4.4.2.1, chapter 4) showed that International writers (16.8 tokens per 1000 words) used more boosters compared to Iranian ones (14.3 tokens per 1000 words). It seems that the International dentistry writers are more aware of boosters' role in the academic writing. They prefer to express their statements more compellingly and in a more assertive tone compared to their Iranian counterparts. The present results are in line with some previous studies, including Attaran (2014), Mirhashemi (2013) and Rahimpour and Faghih (2009).

Moreover, the results signified that boosters in the corpus appeared in 8 main subcategories. The most frequent subcategory of boosters was lexical verbs in both datasets (43.8% in International and 55.2% in Iranian articles). The second frequent subcategory of boosters was quantifiers in both International (41.3%) and Iranian (28.00%) articles. Iranian writers used more lexical verbs and fewer quantifiers compared to their International counterparts. They followed a similar trend in the deployment of other subcategories of boosters. It seems that Iranian writers should use

less lexical verbs and more quantifiers in order to adopt the discourse community's norms.

5.2.3.3 Attitude Markers

Attitude markers are those rhetorical devices that enable writers to express their authoritative viewpoints towards the ideational matter. By using such a device, authors are able to express their opinions or judgments through the feelings such as surprise, agreement, obligation, etc. (Hyland & Tse, 2004). Attitudinal devices can be represented by various parts of speech such as attitude verbs (*prefer*, *disagree*), adverbs (*interestingly*, *surprisingly*) and adjectives (*dramatic*, *essential*).

Results of the frequency analysis (consider section 4.4.3.1, chapter 4) showed that both International (0.06 instances per 1000 words) and Iranian (0.2 instances per 1000 words) dentistry articles did not contain attitude markers (less than 1 instances per 1000 words considered as 0 instances in this study). It seems that neither International nor Iranian dentistry writers tend to express their subjectivity and feelings about the propositional matter due to the nature and conventions of the academic writing. Such a result is in concordance with previous findings by Salek (2014) and Zarei and Mansoori (2011).

5.2.3.4 Engagement Markers

Engagement markers are the fourth category of interactional metadiscourse and help the writers to determine the degree of readers' presence in the discourse. Writers use such devices in order to create a relationship with readers, address them explicitly and draw them in the discourse (Hyland, 2005a; Hyland & Tse, 2004).

Results of the frequency analysis (refer to section 4.4.4.1, chapter 4) demonstrated that both International (0.1 tokens per 1000 words) and Iranian (0.04 tokens per 1000

words) dentistry research articles contained no instances of engagement markers (less than 1 instances per 1000 words considered as 0 instances in this study). It is obvious that both International and Iranian dentistry writers are not in favour on building a dialogic discourse with readers and addressing them through the text.

5.2.3.5 Self-mentions

The fifth and last category of interactional metadiscourse devices, namely self-mentions, enable writers to explicitly present themselves in the discourse. The degree of writer' explicit presence in the discourse is totally based on writers' conscious decision. This presentation is done through first-person pronouns and possessive adjectives (*I, me, mine*...) (Hyland 2005a, p.53).

According to the results of frequency analysis (see section 4.4.5.1, chapter 4), there were no instances of self-mentions in both International (0.7 instances per 1000 words) and Iranian (0.3 instances per 1000 words) dentistry articles. It is clear that both International and Iranian dentistry writers prefer not to control the research credibility directly by their own authorial power. In other words, they create space for linguistic objectivity instead of imposing on their propositional matter.

5.3 Functions of Metadiscourse Markers in the Corpus

This section answers the second research question of the current study: "How International and Iranian dentistry writers employ metadiscourse functionally in International research articles?"

5.3.1 Interactive Metadiscourse Markers

5.3.1.1 Transitions

As mentioned in chapter 4, transitions in the corpus employed to fulfill 5 communicative functions: 1) providing background information (refer to examples 4a-

4d, chapter 2), by which the writer attempts to provide precise background information about the topic; 2) describing the methodological procedures (refer to examples 5a-5d, chapter 4), by which the writer tries to guide the readers easily grasp the information provided regarding the different steps of research practice and explains how and why the data in her/his study is formed and manipulated; 3) reporting and commenting on results (consider examples 6a-6d, chapter 4) through which the writer helps the reader better understand the intended interpretation, and 4) referring to literature (consider examples 7a-7d, chapter 4), through which the writer refers to literature to review previous results.

Results of the functional analysis (refer to section 4.3.1.2, chapter 4) demonstrated that Iranian writers (3.3 instances per 1000 words) surpassed their International pairs (2.2 instances per 1000 words) in using transitions to describe background information of the study. It seems that Iranian dentistry writers are more concerned about convincing their readers on the well-established area of the topic.

Regarding the second function, describing the methodological procedures, Iranian writers (9.2%) surpassed their International counterparts (5.3%) in using transitions to explain the methodological process. It seems Iranian dentistry writers tend to explain the methodological process of their research and guide the readers through the steps of conducting their study.

Deployment of transitions for reporting and commenting on results was seen just in International dataset (4.0 tokens per 1000 words). It can be concluded that International writers are more aware of transitions' role in presenting their results and making claim on them.

The use of transitions for referring to the literature was higher in Iranian dentistry articles (5.2 instances per 1000 words) compared to International ones (1.3 instances per 1000 words). It seems that Iranian writers, compared to their International peers, are more aware of the importance of comparing and contrasting their findings with the earlier results in order to validate their new contributions.

5.3.1.2 Code Glosses

Regarding the results of the functional analysis (see section 4.3.2.2, chapter 4), code glosses in the corpus served 2 communicative functions: 1) exemplification (see examples 8a-8d, chapter 4), and 2) reformulation (refer to examples 9a-9d, chapter 4). Writers use exemplification devices to provide examples in order to help the readers to better grasp the meaning of propositional material. Some of the exemplification devices recognized in the corpus are *for example*, *including*, *such as*, and *namely.* Reformulation devices are those through which the writer reformulates the ideational matter to provide more clear information for readers. This can be done through 1) lexical words or phrases like *that is*, *in other words*, *specifically*, etc., and 2) punctuation markers such as comma or parenthesis (Hyland, 2007). This categorization is in line with the studies of Khedri (2014) and Hyland (2007).

The results demonstrated that reformulation devices were more frequent in both International (10.8 tokens per 1000 words) and Iranian (11.00 tokens per 1000 words) dentistry articles compared to exemplification devices. It seems that both International and Iranian dentistry writers are similarly concerned about reformulating and reworking the previous statements to provide more opportunities for readers to grasp and understand the discourse.

Exemplification devices are used in a similar trend in both datasets. Besides, they are not as frequent as reformulation devices in the corpus (1.5 instances per 1000words). It

seems that both International and Iranian writers follow the same trend of using code glosses in their articles.

5.3.1.3 Endophoric Markers

According to the results of the functional analysis (see section 4.3.3.2, chapter 4), International and Iranian writers employed endophoric devices to fulfill three different communicative purposes: 1) presenting the study, 2) delineating research designs and methodological process, and 3) stating findings of the study.

Regarding the first function, writers employed endophoric markers to introduce the goals, significance, and limitation of the study (see examples 12a-12b, chapter 4). Results demonstrated that endophoric devices in the International corpus had just one occurrence per 1000 words for such a purpose. Regarding Iranian corpus, no endophoric device was used for presenting the work.

As for the second function, writers used endophoric devices to determine the design of the research and its methodological process (see examples 13a-13b, chapter 4). According to the results, International (2.5 instances per 1000 words) and Iranian (1.6 instances per 1000 words) writers employed endophoric devices for such a purpose in a similar trend.

Regarding the third function, stating finding, writers used endophoric devices to report the new findings of their study (see examples 14a-14b, chapter 4). The use of endophoric devices for such a function had a similar pattern in both sets of data (International 3.8 and Iranian 4.6 tokens per 1000 words).

The above-mentioned findings illustrate that Iranian dentistry writers followed the same pattern of using evidential markers as their International cognates. The judicious employment of these intra-textual devices prevent the inessential repetition of the

sentences (Abdi et al. 2010) and helps the reader better understand the writer's intended meaning by providing references for the unfolding parts of the discourse (Hyland, 2005a).

5.3.1.4 Evidentials

The results of the functional analysis of the evidentials in the corpus (see section 4.3.4.1, chapter 4) indicated that such a markers were used to accomplish three communicational purposes in the discourse: 1) signaling reasonable foundation for the study (consider examples 17a-17d, chapter 4), 2) explaining and justifying experimental procedures of the study or previous ones (consider examples 18a-18d, chapter 4), and 3) supporting the new findings of the study (see examples 19a-19d, chapter 4).

As for the first function, writers deployed evidential markers to present a satisfactory and acceptable basis for their study. According to the results, Iranian (5.8 instances per 1000 words) writers used more endophoric devices to accomplish such a purpose in the discourse compare to International ones (3.1 instances per 1000 words). As for the deployment of the second function, explaining and justifying experimental procedures of the study, International (1.9 tokens per 1000 words) and Iranian (1.4 tokens per 1000words) dentistry writers showed a similar trend. This is the least frequent function of evidentials in both datasets. Regarding the third function, writers employed evidentials to support the new findings of their study by providing references to previous studies. Results revealed that although this is the most frequent function of evidential markers in both datasets, Iranian dentistry writers were more eager to provide external references to support the validity and credibility of their findings.

It can be concluded that Iranian writers do not exactly follow the International writers' in the functional deployment of evidentials. It seems that Iranian writers should

use less evidential devices to signal reasonable foundation for their study and to provide Intertextual support for their new findings.

5.3.1.5 Frame Markers

The results of the functional analysis disclosed that frame markers meet four communicative purposes in the corpus: 1) sequencing the ideational meaning consider examples 20a-20b, chapter 4), 2) announcing the goals and scope of study (see examples 21a-21b, chapter 4), 3) labeling stages of the text (refer to examples 22a-22b, chapter 4), and 4) indicating shift in topic (see examples 23a-23b, chapter 4). All these four functions were patterned similarly in International and Iranian datasets. It can be concluded that Iranian dentistry writers follow the International writers' pattern of functional deployment of frame markers in their articles.

5.3.2 Interactional Metadiscourse

5.3.2.1 Hedges

The results specified that hedges in the corpus served four communicational functions: 1) making assumptions about the topic, 2) referring to the literature, 3) sharing their knowledge of research designs and methodological approaches, and 4) interpreting and commenting on results. The most frequent communicational function of hedges in both International and Iranian articles was interpreting and commenting on results. International and Iranian dentistry writers utilized hedges for referring to literature and sharing the knowledge of research designs and methodological approaches in a same manner. Iranian dentistry writers did not use hedges for making assumptions about topic and this function was not also very frequent in the International articles (1.7 instances per 1000 words). It can be claimed that International and Iranian dentistry writers had a similar linguistic tendency in using hedges for the mentioned purposes.

5.3.2.2 Boosters

As results illustrated, International and Iranian dentistry writers employed boosters in the corpus to fulfill four communicational functions: 1) help readers to understand the extant literature, 2) bolding the accuracy and preciseness of exploited methodology, 3) emphasizing research outcomes, and 4) boosting previous results. The most frequent function of boosters in both International and Iranian datasets was emphasizing research outcomes. The second frequent function of boosters in both datasets was bolding the accuracy and preciseness of exploited methodology. The third and fourth frequent communicational functions of boosters in the corpus were boosting previous results, and understanding the extant literature, respectively. It can be concluded that International and Iranian writers presented the same partiality on using boosting devices functionally.

CHAPTER 6: CONCLUSION

6.1 Introduction

This final chapter will bring forth an overview of the current study. This is followed by the summary of findings, the pedagogical implications, and limitations of the study.

6.2 Overview of the Study

The study of metadiscourse may enable us to recognize how authors employ specific rhetorical factors to capture the readers' attention and involve them in the discourse following the discipline- and language-specific norms (Mansoori et al., 2016). Regarding the importance of proper deployment of metadiscourse devices in creating an unfolding and reader-friendly text, it was supposed that improper use of such markers could be lead to the phenomenon of article rejection. To this end, the researcher analyzed a corpus of 20 English dentistry research articles, 10 written by International and 10 written by Iranian writers following the Hyland's (2005a) metadiscourse model to see if Iranian dentistry writers stick to their own native norms or follow the discourse-oriented norms when they write in English.

6.3 Findings Summarized

The whole corpus analysis revealed that in the corpus of 56920 words, 4594 words played the role of metadiscourse. Metadiscourse elements were deployed 77.7 per 1000 words in International and 84.8 per 1000 words in Iranian datasets. The large frequency of metadiscourse devices in the corpus indicates the importance of these elements in academic discourses and highlights the need for the writer to take them into critical concern when they aspire to publish their articles in the representative local and International journals. Results of the frequency analysis demonstrated that Iranian writers used more metadiscoursal elements than their International counterparts. This

result highlights that there are more writers-responsible dimension of Persian language compared to the English language.

Advanced analysis of the corpus points out that interactive metadiscourse (please refer to Table 4.2) elements, compared to interactional ones, were more frequent in both International (63.9 instances per 1000 words) and Iranian (67.1 instances per 1000 words) datasets. Such a result expresses the importance of textual congruity through creating an impersonal relation with readers and besides, rationality and coherence of the presented material in a convincing way.

According to Table 4.2, Iranian dentistry writers used more of interactive and slightly less of interactional devices compared to their International cognates. It can be concluded that Iranian writers are more focused on presenting coherent materials than establishing a close interaction with audiences. The slightly more deployment of interactional devices by International writers (36.00 instances per 1000 words), compared to their Iranian pairs (32.7 instances per 1000 words), indicates the more concern of International dentistry writers to involve their audiences in the discourse, attract their attention to the propositional meaning and create a closer relationship with them. In general, it can be said that the English language is more reader-responsible compare to Persian language.

Results of the frequency analysis revealed that International writers feel slightly less responsible for explicating and clarifying the pragmatic links in the discourse compared to Iranian writers due to using fewer instances of transition devices in their articles. Iranian writers use slightly more transition devices. This makes them to seemingly more responsible in making the pragmatic connections more clearly for their readers. International writers used more instances of code glosses in their discourse so it can be concluded that they are more willing to help readers grasp and understand the intended

meaning by providing more examples or interpreting and paraphrasing the presented information. Regarding the evidentials, Iranian dentistry writers showed more tendency in documenting and providing outside references to support their statements and convince their readers about the validity of their statements compared to their International counterparts. International and Iranian dentistry writers showed a similar tendency in guiding the readers through the text by using the same frequency of endophoric devices in their articles. They also followed a similar trend in topic shifting or refer to the different stages of the discourse because of the equal use of frame markers in their articles.

As for interactional metadiscourse devices, Iranian dentistry writers used more hedging and fewer boosting devices compared to their International cognates. Therefore, it can be said that Iranian writers prefer not to present their ideas in a certain way and as a fact; they leave some open spaces for other voices. On the contrary, International dentistry writers have more tendency for signaling certainty about the propositional meaning and blocking off the alternative ideas. Attitude markers, engagement markers, and self-mentions were absent in both International and Iranian dentistry articles. It seems there is no space for emotional standpoints, considering readers as participants in the discourse, and direct writers' presentation in the dentistry academic research articles.

Functional analysis of the corpus also revealed some similarities and differences in the communicative functions of metadiscourse markers used in the International and Iranian dentistry articles. In the case of transition markers, the most common communicative function in both datasets was describing the methodological process. The second common function of transitions in the International articles was reporting and commenting on results (4.0 instances per 1000 words) while this function was not

detected in the Iranian dataset. Instead, referring to literature (5.2 instances per 1000 words) was the second frequent function of transitions in Iranian datasets while it is the less frequent one in the International dataset.

In the case of code glosses, both International and Iranian writers used more of their code glosses to reformulate the statements in order to help the readers to understand the intended meaning.

As for endophoric markers, both International and Iranian dentistry writers used these devices mostly for stating findings. The second frequent function in both datasets was delineating research designs and methodological process. The least frequent function of endophoric markers was presenting the work and this function was not detected in Iranian dataset.

Regarding evidentials, the most frequent function of these devices in both datasets was supporting the new knowledge intertextually (5.8 and 8.8 instances in International and Iranian datasets, respectively). The second frequent function of evidentials in both datasets was signaling reasonable foundation for study. The least frequent function of evidentials in both datasets was explaining and justifying experimental procedures of the present study or previous ones.

In case of frame markers, both International and Iranian dentistry writers used the functions of sequencing, announcing goals, and labeling stages with the same frequency but frame markers did not use for topic shifting in Iranian articles.

Regarding hedging devices, both International and Iranian writers used these devices mostly for interpreting and commenting on results (6.4 and 7.4 instances per 1000 words in International and Iranian articles, respectively). Other functions of hedging

devices were not very frequent in both datasets. Besides, Iranian writers did not use hedging devices to make assumptions about the topic.

As for boosting devices, both International and Iranian dentistry writers used boosters mainly for emphasizing research outcomes (7.3 and 5.4 instances per 1000 words, respectively). The second frequent function of boosters in both datasets was bolding the accuracy and preciseness of exploited methodology.

All in all, for securing engagement in the dentistry discourse community and for preventing article rejection by the representative journals' editors, Iranian dentistry writers are suggested to use metadiscourse devices more carefully. In the case of interactive metadiscourse markers, they are recommended to use more code glosses, and fewer transitions and evidentials. Regarding interactional metadiscourse markers, they are proposed to employ fewer hedging and more boosting devices. Iranian writers are also suggested to consider using the most frequent communicative functions of each metadiscourse marker and following the norms and conventions of the discourse community in their articles.

Following this norm of metadiscourse employment in the dentistry articles, it is hoped that Iranian dentistry writers become more able to minimize the risk of article rejection when it comes to publication in representative local and International journals.

6.4 Pedagogical Implications of the Study

Metadiscourse is one of the important language features in writing a persuasive and unfolding piece of text, including academic research articles. Research has shown that the appropriate deployment of metadiscourse in texts is an indispensable part of constructing a cohesive and persuasive discourse (cf. Intaraprawat & Steffensen, 1995). Bearing in mind the culture-sensitive nature of metadiscourse and the influence of L1

on L2 writing (Kaplan, 1966; Marandi, 2003), use of metadiscourse features should be an inseparable part of any ESP course. The results of the current study may have significant influence on dentistry writers' awareness of the way International dentistry writers organize theirs texts. This awareness is critical when it comes to communication with International discourse community since we cannot create an effective dialogue with any discourse community unless we realize their ways of organizing a text. Metadiscourse prepares us such knowledge in part. Furthermore, considering the results of the current study, language instructors may suggest effective approaches of teaching interactive and interactional metadiscourse to students and enable them to properly use these features in their research articles to reduce the phenomenon of article rejection. One of such approaches can be involving students in metadiscourse analysis of the research articles from the related discipline. This approach will help the students to understand how the writers of the selected discourse community use metadiscourse features in their academic writing. The students' awareness of using metadiscourse markers will enable them to write a more reader-friendly and interactive texts.

The findings of the current study may help Iranian dentistry writers to understand how International dentistry writers use metadiscourse features in their research articles and enable them to follow the norms of the dentistry discourse community.

6.5 Limitation of the Study

The corpus of the current study was limited to 20 dentistry articles (10 written by International and 10 written by Iranian writers). Such a limited corpus does not provide adequate findings to allow generalization to the entire International and Iranian dentistry research articles. There is a need to further studies with a larger corpus in order to obtain more generalizable results. The second limitation of the present study is related to selecting International research articles. Not all the International articles were written

by native English writers. Another study is needed to compare native English and native Iranian academic writing to provide more reliable results.

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