A Contrastive Study of Hedging in English and Farsi Academic Discourse

by

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ABSTRACT

This study examines the distribution of forms and functions of hedging in academic research articles (RAs) in two languages (English and Farsi), three disciplines (medicine, chemistry, and psychology), and between two rhetorical sections of RAs (Introduction and Discussion).

Data consist of 24 research articles, 12 in English and 12 in Farsi. The RAs were in three disciplines: medicine, chemistry, and psychology (four RAs in English and four in Farsi from each discipline). The total number of words in the two sections in English and Farsi RAs were 25,983 and 19, 872, respectively.

Data were analyzed in terms of both forms and functions of hedges. Findings showed that the English RAs were 61.3 % more hedged than Farsi RAs. Moreover, the distribution of hedging devices was shown to be different across disciplines. The English psychology and Farsi medicine RAs were found to be the most heavily hedged disciplines. The results also showed that the Discussion sections of RAs, in general, favor more hedges than the Introduction sections. The Discussion sections were also found to contain more writer-oriented hedges and fewer accuracy-oriented hedges compared to Introduction sections. The findings suggest that hedges are used differently across languages and disciplines.

Examiners:

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Dedication

To My Dearest Family

Chapter One

INTRODUCTION

This research examines and compares the forms and functions of hedging in research articles in English and Farsi and across three disciplines. Hedging is a basic feature in academic discourse (Rounds, 1982) that enables academic writers to show their certainty and doubt towards their statements, to show the amount of confidence they put on their claim, and to start a dialog with their readers. Hedging is also used to show the lack of certainty in truth value of the proposition stated by the writers. Through using hedges, writers leave some room for their readers to judge the truth value of the assertion. Some examples of hedging are *may, assume*, *unclear,* and *probably.*

Crismore and Farnsworth (1990) argued that hedging is "the mark of a professional scientist, one who acknowledges the caution with which he or she does science and writes on science" (p. 135). Vande Kopple and Crismore (1990), in their investigation of readers' reactions to hedges, concluded that students read hedged texts more evaluatively and with more enthusiasm than unhedged texts. Varttala (1999) has also emphasized the functions of hedging in research articles as the indicator of textual precision and interpersonal relationship.

Research articles (RA) are the main means of communication in academic discourse (Swales, 1990). Therefore, they have been the focus of many studies on genre analysis in recent years (Bhatia, 1991; Holmes, 1997; Hopkins & Dudley-Evans, 1988; Samraj, 2002; Varttala, 2001; Williams, 1999). However, these studies mainly deal with the rhetorical functions of RA sections and the rhetorical categories used in different RA

sections. These studies have tried to show the variation of rhetorical categories across disciplines and RA rhetorical sections.

Due to the significant role of hedging in academic writing, this research examines the forms and functions of hedging in academic research articles by comparing frequency of hedging across three disciplines (medicine, chemistry, and psychology) and between English and Farsi.

1.1 Significance of the Study

The significant role of hedging in academic writing and research articles is well documented in different studies (Hyland, 1994, 1996a, 1996b, 1998, 1999; Salager-Meyer, 1994; Schefter, 1996; Vande Kopple & Crismore, 1990; Varttala, 2001). Hedging expressions can be used in describing methods and results, discussing findings, drawing conclusions from the evidence, persuading readers, and establishing interpersonal relationships between readers and writers. Hedging devices show that the researchers do not intend to discuss the findings and conclusion of their research categorically. Through using hedges, writers also attempt to improve the chance of persuading their readers by taking a cautious perspective in their statements. Such a non-categorical perspective will invite the readers to evaluate the writer's claim for themselves and make their own judgment regarding its validity.

According to Shapin, as cited by Swales (1990), Boyle has considered hedging as one of the strategies through which writers can persuade their readers to accept the claim or assertion made without observing or replicating the experimental scene. While the literature emphasizes the importance of hedging, Hyland (1998) has stressed that we know little about its use, frequency, and distribution in different disciplines or genres.

The neglect of the study on hedging in the past years is reported by Crystal (1995, p. 120) who attempted to shed light on the areas in English language studies which have not received enough attention.

Despite its major role in academic discourse, hedging has received most attention in the context of casual and oral discourse (Coates, 1987; Horman, 1989; Nittono, 2003; Stubbs, 1986). There have not been many cross-linguistic and cross-disciplinary studies on hedging in research articles. The limited number of studies which are conducted in this area have shown that there are some variations in the use of hedges across languages (Clyne, 1991; Crismore et al., 1993; Vassileva, 2001; Yang, 2003) and across disciplines (Varttala, 2001). The cross-linguistics studies on hedging have mainly focused on those languages which belong to western culture. This study examines hedging in non-western European languages like Farsi to see if there are any differences in the distribution of forms and functions of hedges in this language and English.

The three disciplines of this study are also selected to address the scarcity of studies on hedges in these areas. The selection of these disciplines will also help the Iranian students who receive reading assignment in English in these disciplines.

1.2 The Purpose of the Study

The purpose of this research is to identify and compare the forms and functions of hedging in academic research articles across three disciplines, and between English and Farsi. Moreover, this study compares the distribution of forms and functions of hedging across two rhetorical sections of the RAs, namely the Introduction and the Discussion sections.

Two sets of data from 24 RAs in three disciplines were selected: medicine, chemistry, and psychology (eight articles in each discipline, four in English and four in Farsi). The total number of words in the two sections of the articles examined in English and Farsi was 25, 983 and 19, 872 words, respectively.

Data were analyzed both in terms of forms and functions of hedges. In the first analysis the lexical items acting as hedges were identified and classified. Some of this decision was making a distinction between "epistemic" and "root" meanings of the lexical devices which had these two meanings.

In the second analysis, the functions of the hedging forms were examined and analyzed. Hyland's (1998) scheme for the functions of hedges was used for the purpose of the study. He has classified the hedging functions into two main categories: content-oriented and reader-oriented. He further categorizes the content-oriented hedges into accuracy-oriented and writer-oriented hedges. This study is focusing on accuracy and writer-oriented functions of hedges.

1.3 Research Questions

This study addresses the following six research questions:

Q1: What is the frequency of forms of hedging used in the RAs of two languages (Farsi versus English)?

Q2: What is the frequency of forms of hedging in the RAs of three selected disciplines in Farsi and English?

Q3: Are hedging devices (forms) equally distributed across the rhetorical sections of Introduction and Discussion of RAs?

Q4: What is the frequency of functions of hedging used in the RAs of two languages (Farsi versus English)?

Q5: What is the frequency of functions of hedging in the RAs of three selected disciplines in Farsi and English?

Q6: Are hedging functions equally distributed across the rhetorical sections of Introduction and Discussion of RAs?

1.4 Definition of Terms

The main terms used in this study are presented here and a very brief definition of each is given.

Genre: Genre is defined as "a class of communicative events, the members of which share some set of communicative purposes" (Swales 1990, p. 58). It can be regarded as a type of text which is formed according to social or cultural expectations and conventions. According to this definition, research articles (RA), business letters, and grant proposals all belong to different genres.

Hedge: Hedges are defined as "the means by which writers can present a proposition as an opinion rather than a fact: items are only hedges in their epistemic sense, and only when they mark uncertainty" (Hyland 1998, p. 5). Hedges can be either lexical (e.g., *assume, may, possible*) or structural (e.g. passive form) devices through which writers can show their uncertainty towards the proposition. They can also have two main functions, namely content-oriented and reader oriented hedges.

Form: Form refers to lexical categories such as main verbs, adjectives, adverbs, nouns, and modal auxiliaries which exist as the main linguistic categories in most languages. In

this research, forms are limited to those which have epistemic functions in the academic discourse and can be used as hedging devices.

Function: Function refers to the writer's intention in using the hedging forms. This may be of two main types: content-oriented and reader-oriented. Content-oriented hedges mainly concern accuracy and its representation in real world, whereas reader-oriented hedges mainly deal with the interpersonal relationship and the rules of conduct between writer and reader. Content-oriented is further categorized into accuracy-oriented and writer-oriented hedges. Accuracy-oriented hedges refer to writer's intention in expressing propositions with greater precision. Hyland (1998, p. 163) states that this can be done either by "marking a departure from an ideal" or "indicating that a proposition is based on plausible reasoning or logical deduction in the absence of full knowledge." Writer-oriented hedges mostly imply the lack of commitment to the propositional truth by the writers. Their main function is to protect writers' face against any possible falsification of their claims. Due to the methodological problems which will be explained in Chapter 3, the reader-oriented hedges are not considered in this study.

Modality: Modality refers to speaker's attitude towards the truth of a proposition expressed by a sentence and to the situation or event described in that sentence (Simpson, 1990). The communicative force of modality is realized in two ways: epistemic and non-epistemic (root). The epistemic modality realizes a continuum ranging from "possibility" to logical "necessity" as the core which is concerned with speaker's assumptions or assessment of possibilities. It also indicates the speaker's confidence in the truth of the proposition expressed, such as the core meaning of *may*. The root modality covers a range of meaning, of which "obligation" and "permission" represent the core (e.g., *must*).

Chapter Two

REVIEW OF THE RELATED LITERATURE

2.1 Introduction

The present study examines hedging in an academic context, namely research articles. Hedging is a strategy by which writers show their attitudes and the degree of confidence that they have over the truth value of their statements. It is also used for establishing an interpersonal relationship between the readers and writers.

The study of hedges and how they are used in RAs can show how knowledge is created and how scholars carry out this work. According to Hyland (1996a), sociological studies of scientific knowledge consider that "the accreditation of knowledge is a social process, and research is perceived as a quest for collective agreement rather than a search for truth" (p. 252). The main objectives of scientific writers are to convince readers of the truth value of the claims, and to "conceal the contingency of knowledge" (p. 252). The scientific writers, by using some expressions of doubt and uncertainty (hedging), try to show the precision of their statements. Additionally, the writers, by showing the tentative nature of their assertions, invite the readers, as intelligent individuals, to join and decide the truth value of the statement. They also consider the face of others while stating a claim or criticizing the works of their peers.

The first reason for choosing the RAs as the context of this study is that hedging is abundantly used in RA genre (Adams Smith, 1984; Hyland, 1996a, 1996b; Salager-Meyer, 1994; Varttala, 1999, 2001). These studies show that the RA writers stick to this strategy quite frequently in their writing.

The second reason for choosing RAs in this study is because of their significant role in academic discourse. The abundant number of studies conducted on RAs supports their importance in academic writing. Samraj (2002), for example, in her study on 24 RA introduction sections from two different fields investigated the communicative functions and the linguistic features of research articles. The study showed that the elements of persuasion and promotion are more strongly present in conservation biology papers than wildlife behavior texts. Thompson (1994), in another study, concludes that the rhetorical functions of RA Introduction sections are structured for more persuasive purposes compared to introductions in lectures.

Salager-Meyer et al. (1989), in their study, focused on three sub-genres of the medical English (ME) discourse: the research paper (RP) or RA, the case report (CR), and the editorial (ED). In this study, passive voice was shown to be more associated with CRs and RPs whereas EDs represent frequent use of *must*. Moreover, *may* is stated to be the modal which most marks the difference among the three different ME sub-genres.

There are some other studies which are mainly focused on hedging in academic discourse (Hyland, 1996; Varttala, 2001; Vassileva, 2001; Yang, 2003). The analysis of academic written materials has proved to be useful in revealing the pragmatic importance of hedging in different areas such as medical discourse (Salager-Meyer, 1994), molecular biology (Myers, 1989), and text books (Holmes, 1988; Hyland, 1994; Vande Kopple & Crismore, 1990).

In addition to the application of such a study for discourse analysis, the study of hedging can have some pedagogical implications for those working on teaching writing skills. These skills have been a challenging aspect of second language acquisition in the

last two decades or so (Kroll, 1990; Raimes, 1994). Despite their notorious and complex nature, writing skills have been a major focus of researchers and scholars in educational settings. Hyland (2003) has mentioned two reasons for why the teaching of writing has gained such a central role in recent years. The vital role that writing skills play in professional and academic achievement, Hyland states, can be considered as the first reason for giving such a status to writing. The ability to get one's ideas across and communicate effectively is heavily dependent on having good writing skills.

The second reason, as Hyland states, is because of the latest development for writing made in applied linguistics, which is mainly rooted in the works of scholars such as Kaplan (1966), Swales (1981, 1990), and Conner (1996) in the fields like composition studies, second language writing, and contrastive rhetoric.

Contrastive rhetoric was started by Kaplan (1966) as an approach to examine the discourse and rhetoric. This approach has provided insights into the differences across cultures by studying the texts in English and other languages and looking for the differences.

Swales has made a significant contribution to the area of genre analysis by examining and analyzing the academic discourse. The analysis of academic discourse, as stated by Swales (1990), has been historically undertaken in quantitative studies. These studies simply focused on the occurrence of lexical forms in scientific English aiming at providing an account of distributional frequencies of the lexical items in the target language. Due to the shortcomings of this view in accounting for the multi-layered structure of the text, the genre-centered approaches to the analysis of written and spoken discourse took the place of its ancestor and became dominant in this area. This approach,

according to Swales, considers some factors such as "communicative purpose, addresser-addressee relationships and genre conventions" in analyzing a language (p. 3).

In examining the range and frequency of the linguistic devices used in a genre such as research article, an understanding of the hierarchical schematic structures, or move, as Swales (1990) labels them ,of the RA rhetorical sections will be illuminating. Nwogu (1997) defines move as "a text segment made up of a bundle of linguistic features (lexical meaning, propositional meaning, illocutionary force, etc.) which give the segment a uniform orientation and signal the content of discourse in it" (p. 122). Each move in turn can be broken down into a number of "constituent elements or slots" as Nwogu labels them. Swales calls these constituent elements "steps."

Due to the significance of contrastive studies and genre analysis in L1 and L2 contexts (Conner, 1996; Swales, 1990), language teachers and course developers have become more interested in incorporating the findings of research on genre analysis into their syllabi and curricula.

The study on genre analysis can also shed more light on the use of hedging as a significant feature of RA. Bhatia (1993, p. 13) defines genre as a:

> 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 purposes.

Genre analysis has been carried out in academic domains (Anderson & Maclean, 1997; Anthony, 1999; Brett, 1994; Nwogu, 1991; Salager-Meyer et al., 1989; Thompson, 1994) as well as professional domains (James et al., 1994; Henrey & Rosebery, 2001;

Santos, 2002). The purposes of these studies have been to make decisions concerning the target needs of the learners, what should be taught, what should be avoided, and what the learner can be encouraged to transfer from L1. Moreover, they had some contributions to language teaching through helping to develop tools for instructions in English for Academic Purposes (EAP) / English for Specific Purposes (ESP) classes. Swales (1981, 1990) has been one of the leading figures in the application of this approach in an EAP environment. He has attempted to determine the generic structure and linguistic features of research articles as an academic genre in English. His main motivation for focusing on RA as an academic genre is due to the very prominent role which this genre plays in scholarly environment.

Due to the lack of studies conducted on the use, frequency, and distribution of hedges in different disciplines and across languages (Crystal, 1995; Hyland, 1998), this study investigated hedging in academic research articles by comparing different forms and functions of hedging across three disciplines and between English and Farsi. Most of the studies conducted on hedging have either focused on western languages (Clyne, 1991; Crismore et al., 1993), or they have been done in the context of casual or oral discourse (Coates, 1987; Horman, 1989; Nittono, 2003; Stubbs, 1986).

In order to create the necessary ground for the present study, a brief historical background of hedging is presented in the next section.

2.2 Historical Background

The use of the term "hedge or hedging" dates back to Lakoff's (1972) paper entitled "Hedges: A study in meaning criteria and the logic of fuzzy concepts" (Hyland, 1996a; Mauranen, 1997; Meyer, 1997). Contrary to the prevalent idea among logicians at

that time who believed that the sentences of natural languages are either true or false, or lacking a truth value, Lakoff proposed that "natural language concepts have vague boundaries and fuzzy edges", and sentences can often be false or true to some extent (p. 183). Lakoff was not interested in the pragmatic application of hedges but was mainly concerned with the logical properties of words and phrases like *rather, largely, in a manner of speaking, very*, and their ability "to make things fuzzier or less fuzzy" (p. 195). Since then, the concept has been expanded to be used in other disciplines such as Speech Acts Theory (Brown & Levinson, 1987), and oral discourse (Holmes, 1982; Horman, 1989), and has been adopted by language pragmatists and academic discourse analysts (Butler, 1990; Markkanen & Schroder, 1997).

The research has provided various definitions for "hedging" or "hedges". Zuck and Zuck (1986) define hedges as "the process whereby the author reduces the strength of what he is writing" in case the reported news turn out not to be true (p. 172). They try to extend the scope of hedging in a way that it draws on pragmatic uses of the term in language. The interpersonal aspect of hedging and how it can be used in a communicative situation is their orientation in the use of hedging.

Brown and Levinson (1987), define hedges as " a particle, word or phrase that modifies the degree of membership of a predicate or a noun phrase in a set; it says of that membership that it is *partial* or true only in certain respects, or that it is *more* true and complete than perhaps might be expected"(p. 145). They extend the boundaries of hedging to "negative" politeness which is used for avoiding threats to the face of the participants. Hedging in their model is still limited and mostly applied within the scope of speech acts theory and interpreted as a sign of politeness.

The theory of speech acts has been used by Fraser (1974) in the study of hedging. This theory (Austin, 1962) maintains that language is not only used for saying things, but also for doing things with words. This justifies the use of the term "act" in the theory (to perform action). In this theory, there are three different types of acts involved in or caused by an utterance: (1) a *locutionary* act is when we say something which is meaningful and we mean what we say; (2) an *illocutionary* act with an *illocutionary* force is using an utterance to perform a function and (3) a *perlocutionary* act is the actual results or effects that are produced by means of what we say. According to this theory, the same *locutionary* act can have different *illocutionary* forces. For example, the sentence "you should study harder"(*locutionary* act) may be intended as an order, piece of advice, or a threat (*illocutionary* forces).

Searle (1969), in presenting a new theory of speech acts, maintains that "speaking a language is a matter of performing speech acts according to systems of constitutive rules" and he considers Austin's theory as lacking the required rules (p. 38). According to Searle (1971), as cited by Diller (1992), "the semantics of a language can be regarded as a series of systems of constitutive rules and that illocutionary acts are acts performed in accordance with these sets of constitutive rules" (p. 42). These rules represent necessary and sufficient conditions for the performance of a speech act. These rules, Searle states, are more powerful generalizations of Grice's cooperative principles and maxims (quality, quantity, relation, and manner). Accordingly, Searle (1979, p. 62) proposed four semantic and pragmatic rules which can be used as a base for classifying assertive speech acts:

1. The essential rule: the maker of an assertion commits himself to the truth of the expressed proposition.

2. The preparatory rule: the speaker must be in a position to provide evidence or reasons for the truth of the expressed proposition.
3. The expressed proposition must not be obviously true to both the speaker and the hearer in the context of the utterance.
4. The sincerity rule: the speaker commits himself to a belief in the truth of the expressed proposition.

The theory of speech acts was used by Fraser (1974) in the study of hedging. In his study, Fraser investigated some sentences that he called "hedged performatives". These sentences, he asserts, can be considered as the "performance of the illocutionary act" which are hedged through the main verbs. Fraser was mainly concerned with the illocutionary force of a statement. In his study, Fraser drew a distinction between "strongly performative" such as (1a), (1b), and (1c) and "weakly performative" like (1d), and (1e). In a sentence like (1b) the modal *must* relieves the speaker of the responsibility.

(1a) I can promise you that we will be there on time.

(1b) I must advise you to remain quiet.

(1c) I have to admit that you have a point.

(1d) I have to promise you that we will be there on time.

(1e) I must authorize you to leave now. (Fraser 1974, p. 1)

Fraser uses "principles of conversation", following the sense of Grice (1976), to explain the difference between "strong" and "weak" performatives. "According to Fraser, some sentences, like (1d) and (1e), cannot be regarded as a performative act because of the different effects that modals have in these two sentences.

In addition to the idea of hedged performatives, the concept of hedging became wider when Hubler (1983) drew a distinction between two types of hedges - "understatements" and "hedges" (p. 20). There are, he asserts, two manipulative non-direct sentence strategies of "saying less than one means" in order to gain more chance of getting the idea ratified by the hearer. Understatements affect the phrastic correspondence conditions (propositional content of a sentence) like "I am *sort of* tired", whereas hedges affect the neustic validity or the claim to the validity of the proposition a speaker makes, such as "you are tired, *I suppose*." In spite of this distinction made between the two concepts, Hubler is still using "hedges" in a very strict sense since it does not deal with the interpersonal and pragmatic aspect of hedges.

Prince, Frader & Bosk (1982), as cited by Morkkanen and Schroder (1997), discussed two types of hedges in their study of physician-physician discourse: approximator and shield. They state that there are at least two kinds of fuzziness: One is fuzziness within the propositional content (e.g. His feet were *sort of* blue.), the other fuzziness is "the relationship between the propositional content and the speaker (e.g. *I think* his feet were blue), that is the speaker's commitment to the truth of the proposition conveyed." Therefore, they discuss two types of hedges: those that affect the truth-conditions of proposition, which Prince et al. call approximator, and those which do not affect the truth-conditions, but reflect the degree of the speaker's commitment to the truth-value of the whole proposition called shield. Hubler's and Prince et al.'s categories are parallel in the way that Hubler's understatement and hedge stand for Prince et al.'s approximator and shield, respectively.

Hyland (1998) defines hedges as "the means by which writers can present a proposition as an opinion rather than a fact: items are only hedges in their epistemic sense, and only when they mark uncertainty" (p. 5). In this study, the definition by Hyland (1998) will be employed. The authors, through using hedging devices and showing uncertainty, try to show the amount of accuracy of their statements. At the same time, they attempt to save face in case of any possible falsification of their judgments. Through using hedges and attributing the ideas to oneself, writers also invite readers to evaluate the truth value of the proposition as an independent and intelligent individual. Hyland's point of departure from Hubler's and Prince et al.'s definition is that his approach and classification to hedging puts special emphasis on the pragmatic aspect of the strategy. An examination of Hyland's definition shows that the interpersonal aspect of the strategy, such as writer-reader relationship, is emphasized in this definition. Due to the significant role of pragmatic aspect in this definition and its special role in RAs, Hyland's conceptualization of hedging is used in this study.

2.3 Empirical Studies on Hedging

Hedging has proved to be a problematic aspect of language for L2 learners. Robberecht and Van Peteghem (1982) have reported on some difficulties which French and Dutch students faced in using and interpreting epistemic modality in English. They have emphasized that non-native students do not use English modal verbs as frequently as native speakers do in expressing epistemic modality. Blum-Kulka and Levenston (1987) have also reported this source of difficulty for native speakers of Hebrew learning English. Variation across languages and disciplines has been reported to be the main reason for its complexity (Hyland, 1998; Varttala, 2001; Vassileva, 2001; Yang, 2003).

Sections 2.3.1 and 2.3.2 will address these two issues respectively and provide some studies conducted on these areas.

2.3.1 Hedging across Languages

The variation of hedges across languages and cultures has been explored by different studies. Clyne (1991), in a study of discourse patterns employed in academic texts by German and English scholars, shows some cultural differences in the use of hedges. In his study, he focused on three types of texts, namely, English written by English speaking authors and German and English written by German speaking authors. The analysis of this study shows that the greatest use of hedging in academic texts was by Germans, no matter which language they were using. Clyne's findings show the modal auxiliaries as the main device for hedging in both German and English. His finding is different from Holmes' (1988) study in which she has identified a wide variety of lexical items such as main verbs, adjectives, adverbs, and nouns in addition to modal verbs for expressing doubt and certainty in written and spoken discourse,

In a study on the use of metadiscourse by American and Finnish university students, Crismore, Markkanen and Steffensen (1993) compared the argumentative writing of the students in their respective languages. This study shows that there are great similarities in the use of metadiscourse between the two groups of writers although they showed some differences when it came to the subcategories of metadiscourse. Similar to the German scholars in Clyne's study, the Finnish students hedged the propositional content and expressed their attitudes about it more than the U.S. students. Moreover, Finnish students used hedges five times more often than they did certainty markers and the U.S. students used hedges less (three times less often) but still more than

certainty markers. Crismore et al. suggest that expressing certainty is probably inversely related to the use of hedges by students. Many people in the United States, the researchers claim, view certainty as a sign of strength and hedging as a sign of weakness, perhaps because certainty is related to assertiveness and self-confidence. The differences between the U.S. and the Finnish students in the use of hedges and certainty markers is also in keeping with the results of the questionnaire, according to which the Finns evaluate their own competence and confidence as writers lower than Americans (the range of scores for Finns was 3.3-5.6; for Americans 3.3-6.0).

Markkanen and Schroder (1992) in their study of hedging in German, English and Finnish philosophical texts tried to investigate how the writer's cultural and linguistic background can affect the amount and degree of hedging in scientific texts. Choosing the corpus of their study from three articles which are approximately the same length and written by the authors who come from competing paradigms, they attempt to examine the influence of this variable as well. The analysis of the corpus shows that these authors show different ways of hedging their assertions and claims. In agreement with the findings of Clyne's (1991) study, the researchers show that one of the main characteristics of the German article is the use of multiple hedging. The use of modal auxiliaries is identified to be the main hedging device used by the English writer. This idea, however, does not support the findings of Holmes' (1988) study. The authors emphasize that due to the small size of the corpus used in this study, the use of the specific hedging devices may be considered as idiosyncratic to the writers and not generalizable to other situations.

Yang (2003) in a quantitative and comparative study of hedges in English and Chinese academic discourse investigated the frequency and distribution of hedges across the two languages and the rhetorical sections of RAs. The results of this study show that hedges are used three times more in English RAs than Chinese RAs. Yang has also stated that Result and Discussion sections are the most heavily hedged sections in Chinese RAs whereas Introduction, Discussion, and Result sections are the parts which contain the most hedges in English RAs. She has also mentioned that the frequency of hedges in all the Chinese RA rhetorical sections, except for Method section, is almost evenly distributed. The epistemic adverbs, adjectives, and nouns are also reported to be the most frequent epistemic categories in Chinese RAs.

Vassileva (2001) has conducted research on English and Bulgarian academic English trying to examine the similarities and differences in the degree of hedging devices used in these two languages. Focusing on texts in English, Bulgarian and Bulgarian English, she found that the degree of hedging devices was the highest in English and the lowest in Bulgarian English, while Bulgarian came somewhere in between. She also found both Introduction and Discussions sections of English texts more hedged than the other sections. The significant finding of her research shows that once the Bulgarian writers make a claim, they stay committed to their initial claim notwithstanding any possible deviations from the expected results which may appear in the course of the investigation. Vassileva raises this issue to argue for the variation in the distribution of hedges and boosters (intensifiers) in English and Bulgarian across different RA section. The Bulgarian writers seem to be different from English scholars

who are much more indirect in stating their claims, but quite confident in final results and conclusions.

These studies show that the rhetorical conventions may vary from one language to another. Some languages prefer a more assertive style (e.g. Chinese, Yang 2003), whereas some other language favor a more tentative style (e.g. Finnish, Crismore et al. 1993). In section 2.3.2 the role and influence of discipline in using hedging devices is discussed and the related studies to this topic are reviewed.

2.3.2 Hedging across Disciplines

The conventions of the discipline in question may also have their role in scientific writing. Researchers have found that hedging is used differently across different disciplines. Varttala (2001), for example, in his study on hedging in three disciplines of economics, medicine, and technology has reported that the incidence of hedging in economics is the highest and the overall number of hedges in medicine and technology is about one third lower. He considers the object of the study, the different types of material and method used to study these objects, and the general nature of disciplines as the main reasons for such variations. This study also shows that the Discussion section is the most heavily hedged section in RAs followed by Introduction. The findings also indicate that hedges are more evenly distributed in technology RAs than in the other two disciplines.

Salager-Meyer (1994) in her study on hedges in medical English written discourse has focused on the distribution of five pre-established hedging categories (i.e., shields, approximators, authors' personal doubt, emotionally-charged intensifiers, and compound hedges) in different rhetorical sections of two fundamental medical English genres - case report (CR) and research paper (RP). In spite of the fact that her classification of the five

categories seem to be overlapping and not quite distinct, her study is quite revealing in showing the different distribution of hedging categories across rhetorical sections of the two genres. The results of this study show that the three most frequently used hedging devices in both genres (shields, approximators, and compound hedges) account for 90 % of the total number of hedges used in the medical texts. Salager-Meyer's study also shows that the Discussion sections in the RP and Comment section (equivalent of Discussion section in RP) contain the most hedges whereas the Methods sections are the least-hedged rhetorical sections.

Hedging is also studied in modern economics to examine how it can modify claims in research articles. Bloor and Bloor (1993) used a set of eleven economic texts to extend the empirical evidence on hedging in this field. Their main objectives in the study were to investigate the way in which economists make knowledge claims in RAs and also to see how far their claims are modified. The authors of this study state that the amount of hedging that researchers use in their RAs is closely connected to the type of claims that they make in their study. In this research they focus on different kinds of claims, namely field central, critical and meta-textual claims. They also mention that economics texts are less hedged than biology articles.

Hyland (1994), in an attempt to examine hedging in EAP (English for Academic Purposes) and EST (English for Science and Technology) textbooks, examined a corpus of 24 textbooks which were representative of a range of writing material intended for L2 students. In his analysis of the corpus of the study, he concludes that the general interest in modality which exists in the research literature is not widely reflected in the pedagogic

materials. Moreover, he finds EAP writing texts as dealing more with the issue of modality compared to ESP materials.

Hyland (1996a), in his later study, aimed at both characterizing the role of hedging in cell and molecular biology RAs and providing a baseline data for subsequent studies in other fields. In this study, he worked on a corpus of 75,000 words taken from 26 English research articles in the field. As a part of the findings of the study, he stated that hedging expressions have considerable variability in the RA genre and they are functionally indeterminate and polypragmatic. The findings of his study show that hedging is principally a lexical phenomenon, with 79 % of hedges realized by main verbs, adjectives, adverbs, and modals. Epistemic adverbs are ranked second after main verbs for expressing hedging in his corpus.

From these studies it can be concluded that there might be different disciplinary cultures for using rhetorical features like hedging devices. Another speculation is that the distribution of hedging expressions can vary across different rhetorical sections of RAs.

2.4 Hedging and Modality

Due to the wide range of meaning expressed by hedging, there are different linguistic concepts which may come close to hedging, having the same function and use. One of these linguistic concepts which is closely related to hedging is modality. Researchers have provided different definitions for modality. Halliday (1970) considers modality to be related just to those linguistic items which are concerned with the assessment of probability and possibility, whereas according to Simpson (1990) modality refers broadly to "a speakers' attitude toward or opinion about the truth of a proposition expressed by a sentence and toward the situation or event described by a sentence" (pp.

66-67). Modality is divided into two main categories: root and epistemic (Coates, 1983, 1992; Heine, 1992). Coates (1983, 1992) considers epistemic modality as the "speaker's assumptions or assessment of possibilities" which can show the speaker's confidence or lack of confidence in the truth of the proposition expressed (p. 55). Lyons (1977, p. 797) defines epistemic modality as "any utterance in which the speaker explicitly qualifies his commitment to the truth of the proposition expressed by the sentence he utters." Perkins (1983) states that epistemic modality can be expressed through the use of some lexical and structural devices (e.g., passive structure). His classification for lexical devices includes modal auxiliaries (e.g., *may* and *could*), adjectives (e.g., *possible*), adverbs (e.g., *usually*), nominal expressions (e.g., *possibility*), and epistemic main verbs (e.g., *suggest*).

Root or non-epistemic modality, on the other hand, is "concerned with the necessity or possibility of acts performed by morally responsible person" (Lyons 1977, p. 823). Coates asserts that root modality covers a range of meanings such as "permission and obligation and also possibility and necessity"(p. 55).

Hedging is associated with the epistemic modality since both epistemic modality and hedging express the degree of speakers' confidence in the proposition expressed. Hyland (1998) has emphasized the link between hedging and epistemic modality by stating that "the writer or speaker's judgments about statements and their possible effects on interlocutors is the essence of hedging, and this clearly places epistemic modality at the center of our interest" (p. 2).

Markkanen and Schroder (1997) propose that epistemic modality can be considered as one of the sub-functions of hedging. Since hedging conveys a range of meanings such as modification of the commitment to the truth value of proposition and

also interpersonal meanings, considering hedging as an umbrella term with regard to epistemic modality seems to have some support.

The lexical category which is mostly associated with epistemic modality is modal auxiliaries (Coates, 1983; Palmer, 1990). Due to the wide range of meanings of modal auxiliaries (e.g., possibility, permission, necessity, and obligation), they may cover a range of meanings which can be associated to hedging, but in different degrees. The following two examples taken from Coates (1983, p. 132) are provided to show how one modal auxiliary (e.g., *may*) can be used in different meanings in various context.

(1) I *may* be a few minutes late.

(2) I am afraid this is the bank's final word. I tell you this so that you *may* make arrangement elsewhere if you are able to.

In example (1), the auxiliary *may* is used in its epistemic possibility meaning because it shows tentativeness and the speaker's lack of confidence in the truth of proposition. One of the most important characteristics of the epistemic *may* is its use as a hedge. However, in the following example (2), the auxiliary *may* is used in its root or non-epistemic meaning which is not linked to hedging. In (2), this auxiliary *may* is associated with root possibility which usually implies willingness or intention. In addition to the main distinction made between epistemic and root possibility, Coates (1983) made a distinction between epistemic and root necessity. The following examples taken from Coates (1983) show such a distinction.

(3) This *must* be one of the finest views on the whole processional route (p. 44).

(4) Clay pots *must* have some protection from severe weather (p. 35).

The above examples exemplify epistemic and root necessity, respectively. In (3), the speaker is showing his confidence in the truth of what he is saying based on a logical

process of deduction from facts known to him. According to Coates (1983) in interpreting the epistemic *must*, two elements of meaning should be taken into account: "first, logical inference, and secondly, the extent to which the speaker expresses his confidence in the truth of this inference" (p. 41). The example (4) above can be interpreted as "it is necessary for . . ." which shows necessity and obligation.

It should be mentioned that the hedging effect of the two auxiliaries *may* and *must* is not the same. *May* shows more tentativeness and has a higher degree of hedging effect, whereas *must* expresses less tentative meanings. Since the semantic scopes of these two auxiliaries fall very close to each other (showing tentativeness), they can be both categorized as epistemic modal auxiliaries which can function as a hedge.

In addition to *must*, there are also some other modal auxiliaries which may show epistemic necessity. Coates (1983) mentions *should* as being associated with epistemic meaning as well. She states that epistemic *should* expresses a tentative assumption. However, Coates makes a distinction between *must* and *should* by stating that *must* means "I am sure" whereas *should* means "I think it's probable" (p. 64). The following example taken from Coates (1983) shows this meaning of *should.*

(5) The trip *should* take about sixteen days. (p. 64)

In this example, the speaker is proposing a logical assumption indicating some degree of uncertainty by using the modal auxiliary *should.* This sentence can be paraphrased as "I think it is probable that our trip will take sixteen days."

From these examples it can be noticed that the epistemic possibility and necessity can be considered as a continuum having different degrees and range with two ends (*may*

on one end and *must* on the other end) and having some modal auxiliaries falling in between (e.g., *should, could*).

The domain of modality has been defined differently by some scholars. Halliday (1970) uses the terms "modality" versus "modulation" which, to some extent, correspond epistemic and root meaning, respectively. He defines modulation as linguistic devices which "express various types of modulation of the process expressed in the clause; modulation in terms of permissions, obligations and the like" (p. 336). So modality in Halliday's definition stands for the epistemic modality which is used more commonly. Halliday (1994), as cited by Hyland (1998), argues that modality falls within the interpersonal system of the language which acts on the role between writer and reader. Halliday argues that since modality is not subject to distinctions of tense and polarity, it cannot be a part of the ideational aspect of the clause, hence assigning it to the interpersonal component (macro function of the language). He argues that modality "mediates the role between writer and reader and thus represents the personal involvement of the writer in the text."

Hyland (1998), contrary to Halliday, assumes that modality performs both interpersonal and ideational (informational) functions. He uses the interpersonal functions of modality to arrive at a model for the functions of hedges.

Using the distinction made for modality by Lyons (1977), Hyland argues that subjective modality locates the uncertainty in the speaker's mind whereas objective modality locates it in "an unverifiable state of external affairs" which is rooted in the imprecision of the state of affairs. Lyon (1977) further states that epistemic modality is usually regarded as subjective by linguists. Since epistemic judgments are always made

by the speakers in natural languages, it is reasonable to consider the epistemic modality as subjective.

The association of hedging with epistemic modality and possibility is established in the above discussion. Due to the significant role that modal auxiliaries play in English as hedging devices (Adams Smith, 1984; Butler, 1990; Hyland & Milton, 1997), each of them is briefly discussed in the following section. The abbreviations "psych, chem, and med" used in the following section and the numbers (1- 4) refer to the three disciplines (psychology, chemistry, and medicine) and the related number of article from which some excerpts are taken for further clarification.

2.5 Modals in English

2.5.1 May/Might

According to Coates (1983), *may* and *might* are the primary modals used for epistemic possibility which can express the speaker's lack of confidence in the proposition expressed. Both modals can equally indicate assessment of possibility. *May* can be used in different senses. But the major distinction is normally made between epistemic and root possibility of *may*. The epistemic *may* shows that the occurrence of an event is not certain whereas root *may* shows the possibility of an event in terms of natural facts. However, such a distinction between these two senses is not always straightforward:

(6) Further research that focuses on a continuous approach *may* contribute to this area of investigation by . . . . (Psych 2, p. 171)

This sentence can be interpreted in either of following ways:

"it is possible that further research contribute to this area of investigation" or

"it is possible for further research to contribute to this area of investigation."

There may be some indicators in the context which could be used in recognizing epistemic *may* from root possibility. The underlined expressions in the following sentences indicate that the writers do not intend to express full confidence in their statement. This lends support to interpreting *may* as epistemic rather than root possibility.

(7) Our results *may* suggest that personality disorders *may* be important to consider, especially among patients with moderate or severe depression. (Psych 2, p. 172)

(8) Although the role of T lymphocytes in this process has not been well defined, it has been speculated that they *may* not contribute to the clearance of the bacteria and *may* be damaging to the host. (Med 1, p. 210)

(9) However, the results presented in this study indicate that property enhancements through fiber reinforcement *may* be sufficient to warrant renewed interest in phenolic foam for structural sandwich panel core. (Chem 1, p. 947)

The presence of some epistemic main verbs such as *suggest, speculate, and indicate* in examples (7), (8), and (9) can help to identify the epistemic role of *may* in these sentences.

Perkins (1983, p. 50) has made a distinction between "primary" (can, may, must, will, and shall) and "secondary" (could, might, ought to, would, and should) modals in terms of some common semantic features that are not present, at least in the same degree, in the "primary" group. He has argued that the secondary modals, e.g. *might*, express more tentativeness compared to the primary modals such as *may*.

2.5.2 Can/Could

Perkins (1983, p. 37) stated that *can* and *may* have the same core meaning. However, *can* only happens with epistemic meaning in interrogative or negative sentences. Example (10) below shows that the modal auxiliary *can* shows some degree of uncertainty when used in a negative sentence.

(10) Further, it *cannot* totally be that the instructions and item-format similarity drove these relations because there were some differences in instructions and the general format of the HAT Scale and the formats of the Ho and BDHI.(Psych 3, p. 489)

As it was stated previously, *may* is mainly favored for epistemic purposes whereas *can* occurs mostly for "ability and legitimacy" uses. The majority of the occurrences of *can* includes its use with "legitimacy and ability" types as shown in the following example:

(11) The micrograph shows a foam fragment at the fracture surface containing aramid fiber tips, from which we *can* deduce that the fiber had been initially pulled out of its phenolic sheath and then bent during fracture. (Chem 1, p. 945)

The use of *can* in example (11) implies that the deduction arrived at in the study is legitimate. Although *can* does not favor the epistemic meaning very much, *could* happens to be very similar to *may* and *might* for expressing epistemic possibility (Hyland 1998, p. 109). The co-occurrence of *could* and *may* in academic papers lends some support to the idea that their epistemic function coincides. This means that these two auxiliaries serve almost the same epistemic function and show the same level of certainty in the context. The following example taken from chemistry article is provided for further clarification.

(12) Even though the tetrahedral Ti sites are present in both types of samples, it *may* be reasonably proposed, on the basis of better catalytic performance in the epoxidation reaction, that the uncalcined catalysts have more isolated tetrahedral Ti active sites. During the calcination, the mobility of bi- and monopodally anchored Ti species *could* lead to oligomerization. Also, calcination *may* result in migration of the titanium centers into the support framework. This process *could* be facilitated by the siloxide ligands of the precursor, which are converted to new silica centers on the surface. This "new silica" *may* remain closely associated with the titanium centers and render them less accessible and more like framework Ti centers. (Chem 2, p. 8386)

The sequence of *may* and *could* in the above example indicates the approximation of semantic and epistemic area between these two modals. Coates (1983, p. 113) has mentioned two other uses of *could*: one is the use of it as the past tense form of "root

possibility" *can* and the other is the hypothetical form to express root possibility in unreal conditions. However, the main controversy is the distinction of root and epistemic possibility from each other. She recognizes the "enabling" or "disabling" conditions as the distinguishing criteria for the occurrence of root meanings. However, epistemic possibility refers to the assessment made in the writer's mind regarding the possibility of an event. The following two excerpts exemplify the epistemic and root meanings of *could*, respectively.

(13) This imbalanced relationship between epithelial damage and repair *could* be related to atrophic changes reported in the gastric mucosa of high-risk population. (Med 1, p. 210)

(14) We also wanted to indicate the degree of accuracy to which individuals with depression *could* be classified into their respective severity group as a function of their unique characteristics. (Psych 2, p. 163)

The modal auxiliary *could* in sentence (13) shows epistemic possibility whereas in sentence (14) it indicates the enabling situation of classifying individuals into their respective severity group which is related to its root meaning.

2.5.3 Would

The principle epistemic function which is reported for *would* is showing *tentativeness* or *hypotheticality* (Coates, 1983 ;Huddlestone, 1971).This modal, when used in this sense, is usually followed by some verbs such as *seem, appear*, and *expect* (passive). These verbs have tentativeness as part of their own meaning and their occurrence with *would* reinforces this aspect of meaning. The following example shows this point.

(15) It *would* then *appear* that the infecting bacterial load is high and the exposure was *probably* repeated over time because of the very high prevalence of infection in the community. (Med 1, p. 210)

A close examination of academic texts shows that a major proportion of epistemic *would* is used when writers intend to state the hypotheses of their study. Writers try to modulate the categorical assertions which make the basis of their hypotheses through using *would* when stating the hypothesis of the study. However, this does not imply that, as Hyland states, writers do not intend to exert all their commitment to the propositions. Through using some "softening" modals like *would*, writers try to "avoid forcing the reader to accept a forthright insistence on the recognition of the claim." The following examples are provided for further clarification of this point.

(16) . . . we hypothesized that particular personality disorders (such as borderline, histrionic, avoidant, dependent, and self-defeating) *would* be moderately to strongly correlated with depression severity. Second, we hypothesized that each level of depression severity *would* have its own unique pattern of personality characteristics according to the MCMI-II. Last, we expected such unique patterns of personality characteristics to emerge as a linear discriminant function, which could be used to classify depressive severity groups at a rate greater than expected by chance. (Psych 2, p. 164)

(17) It was hypothesized that those who experienced loss of either kind *would* score lower on the measures of well-being, and report higher levels of depression. (Psych 4, p. 184)

Coates (1983, p. 208) has also mentioned another epistemic use of *would* namely past tense of will which is used for showing past "confident assertion or prediction." Despite the abundant use of epistemic *would* in academic texts, Coates (1983) has reported the rare occurrence of root forms of *would* in scientific writing.

2.5.4 Shall /Should

The diversity of *shall* in its root meaning rather than in its epistemic meaning can be one reason for finding it less in its latter meaning in written academic materials. Coates (1983) has reported just one epistemic meaning for *shall,* the "weak 'futurity'

sense of prediction." In this sense, it can be equivalent to "I predict that . . . / it is predictable that . . . ." Huddleston (1971) has discussed the epistemic use of *shall* under the label of "logical necessity." *Shall* usually prefers first person plural subject when used as an alternative to will.

Hypothetical *should* shows some similarities in its use to hypothetical epistemic *would*. Hyland (1998) attributes the more tentative nature of *should* to its futurity. The epistemic *should*, hence, can express "less confident assessment of probability based on facts known to the writers" when compared with epistemic *would*. In the following example the epistemic modal *should* shows some degree of tentativeness in the statement made by the writer.

(18) Much better index contrast *should* be *possible* if the low and high index components of a material are not formed simultaneously via the same chemistry. (Chem 4, p. 1432)

Hyland (1998) discusses that epistemic *should* links "subjectivity (i.e. the writer's attitude to proposition, what he or she believes is probable) and logical assumption (what is known from the known facts)" (p. 114). The second meaning of epistemic *should,* as cited by Coates (1983), is hypothetical meaning expressing unreal conditions with a negative implications. The following example is taken from Coates (1983, p. 221) for further illustration:

(19) But in my view we *should* be better employed in embarrassing the Government in this matter.

Sentence (19) implies that embarrassing the Government at present is not materialized. Section 2.6 deals with different functions of hedging.

2.6 Functions of Hedging

In addition to forms of hedging, functions of hedging constitute another main focus of this study. In this section the two main approaches taken in different studies towards hedging functions will be explained (see questions 4, 5, and 6 of the study). First the functions of hedging in politeness model will be discussed in section 2.6.1 and then its functions in polypragmatic model will be addressed in section 2.6.2. The latter approach is adopted in this study.

2.6.1 Hedging Functions in Politeness Model

Hedging has been treated as a sign of politeness by Brown and Levinson (1987) in their unified model of politeness in spoken context. According to this model, hedging is a strategy which is employed to reduce the risk of confrontation in social interactions. In this model, hedges are one type of linguistic device through which negative politeness strategies can be realized. Negative politeness, according to Brown and Levinson, refers to addressee's "want to have his freedom of action unhindered and his attention unimpeded. It performs the function of minimizing the particular imposition that the face threatening act (FTA) unavoidably effects"(p. 129). Since the primary aim of this model has been to account for politeness in face-to-face interaction, their examples are all embedded within a spoken context:

(20) *I wonder* if you could help me with lifting this box.

According to them, the italicized verb in sentence (20) is used to hedge the illocutionary force of the statement. This shows that the speaker does not want to impose an undesirable request to the listener, recognized as negative politeness strategy.

Normally hedges are a characteristic of negative politeness (Brown & Levinson 1987, p. 116), but they can also be used in positive politeness strategies as well. According to Brown and Levinson, positive politeness is "redress directed to the addressee's positive face, his perennial desire that his wants (or the actions/ acquisitions/ values resulting from them) should be thought of as desirable" (p. 101). Unlike negative politeness, in positive politeness the scope of redress is stretched to the appreciation of addressee's desires and wants as shown in sentence (21):

(20) You really should *sort of* study harder.

This model may be criticized based on the lack of distinction between negative and positive politeness. It seems that the line between the two kinds of politeness is not as clear as it is indicated by Brown and Levinson's study.

Myers (1989) used this model in an academic discourse context and interpreted hedging as a politeness feature in his study on biology articles. He states that the hedging expressions which are used in the interaction between writers and readers in scientific articles can be interpreted as the politeness markers. The following example further clarifies this point:

(22) The findings *suggest* a common origin of some nuclear and mitochondrial introns and common elements in the mechanisms of their splicing. (Myers 1989, p. 14)

According to Myers, the italicized verb in (22) can be interpreted as a hedge and it indicates politeness. He argues that the writer, by using an epistemic verb (e.g., *suggest*), tries to imply that the results of the study are tentative. This can be regarded as negative politeness towards the readers. Despite the explanatory power of politeness model for hedging in spoken discourse, it seems that this model is not able to account successfully for the multiple meanings of this functional category in academic discourse. Hyland

(1998, p. 69) states his disapproval over the use of this model for interpreting hedging in academic discourse and argues that:

> We therefore have to reject the politeness view as an adequate explanation for the use of hedging in science and conclude that discourse community norms are likely to play a larger part than credited by the Myers/Brown and Levinson model. To be "polite" is to abide by the rules of a relationship established by the scientific discourse community. It involves adherence to an empirical viewpoint and action as if one trusted all other scientists to do likewise, without such trust, the edifice of scientific knowledge production would collapse. Contributing to a scientific debate involves the writer entering into an interactional contract with specific rights and obligations, among which are limits on self-assurance and norm concerning the deference due to views of other researchers. Adherence to such an interactional contract may exert a stronger influence on scientists than considerations of face, and may prove to be a more insightful means of analyzing the interpersonal use of hedges in scientific prose.

Due to the inappropriateness of this model to account for hedging in academic discourse, Hyland (1998) builds up a functional classification of hedges which is discussed in the next section. This approach is adopted in the present study.

2.6.2 Hedging Functions in Polypragmatic Model

Starting from Zadeh's (1972) theory of fuzzy sets, Hyland established a polypragmatic model of hedging. Noticing that the traditional linguistic principles such as (epistemic) modality cannot fully account for the various functions of hedging, and the mismatch between the surface-form realizations of hedging (e.g., *reference to the limited knowledge* or *passive voice*) and the epistemic modality representations from the other side, Hyland devised a model to account for the multi-functional nature of hedging. The mismatch here refers to the fact that a structural category, e.g., passive, can be used for different functions one of which can be expressing epistemic modality or hedging.

Due to the polysemous and polypragmatic nature of hedging devices, Hyland confirms that assigning specific meanings exclusively to particular forms is not possible.

Hedging categories always contain traces of meaning which are conveyed by the other. Instead of having some categories with "firm boundaries and clear criteria of membership", prototypes model of categories "suggests that members do not necessarily share the same discrete attributes but can be linked by family resemblance. Categories are not homogeneous but have a prototype, good and bad members and fuzzy borders" (Hyland 1998, p. 159). According to this model, hedges can cover an array of purposes such as "weakens force of statements, contains modal expressions, expresses deference, signals uncertainty, and so on" (p. 160). Hyland by proposing this scheme tries to capture the multi-functional nature of the hedges which enables them to have a range of meanings at the same time.

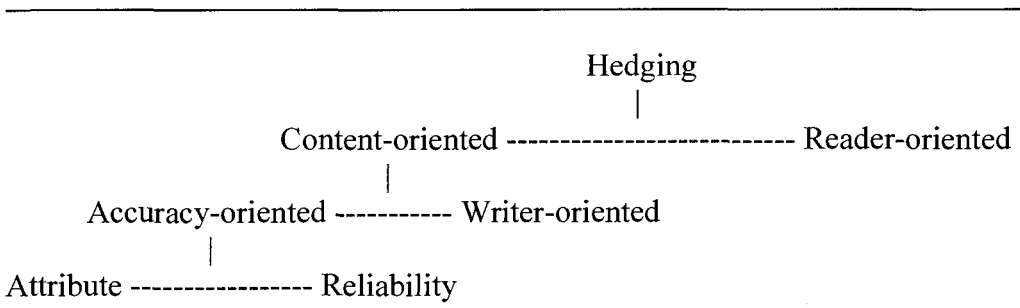

FIGURE 1
A Model of Scientific Hedging (Hyland 1998, p. 156)

Hyland (1998) divides the hedges in the context of academic discourse into two main categories: *content-oriented hedges* and *reader-oriented hedges*. According to him, content-oriented hedges "serve to mitigate the relationship between propositional content and a non-linguistic mental representation of reality; they hedge the correspondence

between what the writer says about the world and what the world is thought to be like" (p. 162).

He further divides the content-oriented hedges into *accuracy-oriented* and *writer-oriented* hedges. The accuracy-oriented hedges refer to "writer's desire to express proposition with greater precision" which are further divided into *attribute* and *reliability* hedges (p. 162). Attribute hedges help writers to specify more accurately how far their results "approximate to an idealized state" and reliability hedges indicate the amount of writers' certainty or uncertainty in a proposition (p. 164). For further clarification of this taxonomy, illustrative examples are provided in Table 1 in Chapter 3.

The writers' main motivation for using writer-oriented hedges is to make a shield for the self against any probable falsification of the proposition. This end is achieved through minimizing their involvement in the proposition and keeping a distance from it. The main distinction between writer-oriented and accuracy-oriented hedges is that writer-oriented hedges mostly concern the writer's presence in the text rather than increasing precision which is the main concern of accuracy-oriented hedges. It should be noted here that this distinction, as Hyland states, is not very distinct and a certain hedges can have multiple meanings at the same time.

The second main category which is distinguished by Hyland is *reader-oriented* categories. The main distinction between this category and content-oriented is that reader-oriented hedges mostly deal with the interpersonal interaction between readers and writers. Hyland argues that ignoring the readers in the text by the writers will present "claims as ex-cathedra assertions" which "displays an unacceptable deviant persona" (p. 178). Certainty and categorical markers do not invite the readers into a negotiation and

imply that the assertion made by the writer is the only possible interpretation of the phenomenon. Ignoring the readers in the text means that the statement made by the writer needs no feedback. Reader-oriented hedges make the readers involved in a dialog and addresses them as a thoughtful individual to respond and judge regarding the truth value of the proposition.

In addition to this interpersonal dimension, Hyland (1998) considers a normative aspect of reader-oriented hedges which "represents conformity to research community expectations concerning deference due to colleagues in presenting information" (p. 178). Hyland considers the personal attribution and reference as the main indicator of reader-oriented hedges. These references can be marked by some indicators such as *I, we, my,* and *our*. Through using these markers, writers try to show that the propositions stated are their "personal opinions, allowing the readers to choose the more persuasive explanation" and have their own judgment (p. 182). Due to the methodological difficulties which will be explained in Chapter 3, the reader-oriented hedges are not taken into consideration in the analysis of the data.

Due to the problems which have been mentioned for using politeness model to account for hedging in academic discourse, this study employs the polypragmatic model which allows for a more insightful analysis of the interpersonal uses of hedges and the various functions which they can play in academic contexts.

This review of literature was provided to build the necessary ground for this study. A survey of historical background of hedging and how its meaning has been evolved was presented. The main empirical studies in this area were also reviewed and the main models for interpreting hedging were also discussed. The next chapter will focus

on the data of the study and the procedures and methods used for analyzing them will be explained.

Chapter Three

METHODOLOGY

This study compares and analyzes a specific feature of discourse analysis, namely hedging across three disciplines of medicine, chemistry, and psychology and also between two languages - English and Farsi. The analysis is based on the comparison between the epistemic lexical forms such as main verbs, adjectives, adverbs, nouns, and modal auxiliaries in 12 English research articles versus the same number of articles in Farsi in three disciplines. The study also compared the two functions of hedging, namely accuracy-oriented and writer-oriented, across the two languages and three disciplines. This study also sought to determine the distribution of hedging forms and functions across two rhetorical sections of Introduction and Discussion in RAs

3.1 Research Questions

In general, I will answer the following six research questions in this study:

Q1: What is the frequency of forms of hedging used in the RAs of two languages (Farsi versus English)?

Q2: What is the frequency of forms of hedging in the RAs of three selected disciplines in Farsi and English?

Q3: Are hedging devices (forms) equally distributed across the rhetorical sections of Introduction and Discussion of RAs?

Q4: What is the frequency of functions of hedging used in the RAs of two languages (Farsi versus English)?

Q5: What is the frequency of functions of hedging in the RAs of three selected disciplines in Farsi and English?

Q6: Are hedging functions equally distributed across the rhetorical sections of Introduction and Discussion of RAs?

3.2 Data and the Data Selection Criteria

This study is based on two sets of English and Farsi data composed of 24 research articles (RA), 12 in English and 12 in Farsi. The RAs were from medicine, chemistry, and psychology, key disciplines for both L1 and L2 students. From each discipline, four RAs were in English and four in Farsi. The total number of words in the two sections in English and Farsi RAs were 25, 983 and 19, 872, respectively (see Appendix A for lists of English and Farsi RAs).

This study focused on two rhetorical sections of the RAs, namely Introduction and Discussion. Due to different rhetorical functions of each RA section, these two parts are considered to be the main sections which contain hedging devices (Hyland, 2000; Varttala, 2001; Vassileva, 2001). In these two sections, writers mainly establish the significance of the study and make generalizations regarding the major findings. Bazerman (1988, p. 243), as cited by Hyland (1998), states that these two rhetorical sections are the ones which physicians read first when scanning a paper in order to get a general idea regarding the content of the paper and to evaluate the article. The previous studies conducted on Introduction and Discussion sections of English RAs have either failed to compare the results of the study to another language (Varttala, 2001) or have focused on a different language rather than Farsi (Yang, 2003; Vassileva, 2001). For the purpose of this study, all the footnotes, long quotations, and abstracts which appeared in

the RAs were deleted from the two sets of data. These are not considered to be part of the main rhetorical sections of RAs.

This study chose articles similar in content in each discipline and language. This was done based on three criteria. One of the major criteria is the approximation of the topics in English and Farsi RAs. Approximation of the topics refers to the similarity of the content of the RAs which could be tested through searching key words, titles, type of study, and also list of references.

The English and Farsi medical RAs which are chosen for the purpose of this study fall into three categories. Four medical articles (two in English and two in Farsi) deal with clinical trials where two separate groups of patients receive different treatments to see their different effects: one receives the treatment which is new and under study (e.g., a new drug) and the other group receives a placebo. The next two articles (one in English and one in Farsi) could be labeled as epidemiologic studies, where the information about the demography of an ailment is reviewed. In this kind of study no actual clinical trial takes place. The last two articles examined as the medical RAs are diagnostic in nature, where some signs and symptoms of an ailment were examined in different groups of patients.

From the eight psychology RAs in the study, six of them (three in English and three in Farsi) dealt with the interrelationships and impacts of a social experience (e.g., loss of parents) on subjects' behavior (e.g., well-being or school success). The last two psychology RAs (one in English and one in Farsi) were related to developing and assessing a measuring scale for an abnormal behavior in the area of social psychology. In addition to this similarity, key words were also taken into account for selecting and

matching the RAs. In choosing the psychology RAs some key words such as "health and well-being, satisfaction, depression, behavioral measurement and scale, and parental loss" were also taken into account.

The chemistry articles came from different sub-disciplines: organic, non-organic and physical chemistry. The related areas as well as some key-words were used as the main criteria for choosing chemistry RAs. Some common key words used in chemistry in both English and Farsi RAs such as "phenolic foams, silica, calcium, epoxy resin" were used as a base for choosing the articles in chemistry and ensuring their approximation.

The second criterion was having the traditional IMRD (Introduction, Method, Results, and Discussion) sections in the RAs. Since this study was focusing on two rhetorical sections of Introduction and Discussion, it was important to have them among the rhetorical sections of RAs. Due to the different conventions which both English and Farsi chemistry RAs follow and contrary to the other two disciplines, the Result and Discussion sections in all chemistry articles (except one) were integrated and appeared under the same section (Results and Discussion sections). An utmost care was exercised at this point of research to separate the Results from the Discussion. Since all Results sections generally contain some amount of comments and discussion in them, having some minor parts which deal with discussing the results deleted while separating the Discussion from Results in the chemistry articles, was assumed not to change the content of the resultant Discussion sections in chemistry RAs. Thus, all the RAs in the two sets of data had comparable rhetorical sections of Discussion.

The third criterion was the date of RA publication. The English and Farsi RAs were all limited to those published within the last ten years. It is assumed that time influences the style of the writers and with this time limit this factor has been taken into account.

Once the research articles in English and Farsi were selected, they were analyzed in terms of the hedging forms and functions. The methods and procedures used for analyzing the data are discussed in the next section of this chapter.

3.3 Procedures

One of the main objectives of this study is to identify and classify the linguistic devices which act as hedges. Another aim is to examine the functions of hedges and to see whether the incidence of hedging forms and functions varies across English and Farsi, the three disciplines of medicine, chemistry, psychology, and the two rhetorical sections of RAs - Introduction and Discussion. In order to meet these goals, epistemic expressions such as main verbs, adjectives, adverbs, nouns, and modal auxiliaries that show uncertainty and tentativeness in the two sets of data were identified. The list of items expressing doubt and uncertainty provided by Hyland (2000, see Appendix B) for English and the list of these expressions for Farsi (see Appendix C) provided by the researcher of this study were used as a guideline. Due to the different interpretations that can be made from hedging devices, decisions were made upon the epistemic meaning of the devices. For example a decision was made whether the modal auxiliary *may* or adjective *possible* in English and the main verb توا نستن (may) in Farsi could be interpreted as having tentative and epistemic meaning. This is because of the fact that some of the expressions could be used in their non-epistemic (root) meanings as well.

The following examples (23) and (24) in English and (25) taken from Farsi data illustrate this point:

(23) The examination of depressive severity group BR standard deviations *suggests* that the derived means of a sample *may* be a poor indicator of personality disorder severity. (Psych 2, p. 172)

(24) One *possible* source of these adventitious carbon contaminants *could* be a dispersing agent such as sodium polyacrylate. (Chem 3, p. 2449)

(25) از این رو، مطا لعه شاد ی و رضامندی خصوصا در جامعه دانشجویی ایرانی از ویژگیهای خاصی در مقایسه با فر هنگهای دیگر *میتوانند* بر خوردار باشد.

Therefore, the study of happiness and well-being, especially among the Iranian university students, *may* have different features from the same study conducted within different culture. (Farsi Psych 1, p. 11)

In examples (23) and (24), the modal auxiliary *may* and adjective *possible* and in example (25) the main verb توا نستن (may) are used in their epistemic meaning. This shows that the writers do not intend to invest full confidence and they show some uncertainty in their statement.

In the following three examples, these expressions have been used not to express uncertainty but rather to show feasibility and practicality of doing something in terms of natural facts:

(26) Depending on the instructions given to respondents, as we have noted previously, the HAT scale *may* be employed as a state, trait, or situation-specific marker of hostile automatic thoughts. (Psych 3, p. 488)

(27) On the basis of this result, it is *possible*, in practice, to design a pretreatment stage to treat $CaCO_3$ filler with phosphate before it is added to the pulp suspension. (Chem 3, p. 2448)

(28) با توجه به شیوع بالای سرطان و لوسمی در کودکان و نوجوانان *میتوان* به اهمیت روشهای درمانی روان شناختی برای پیشگری از عوارض و مشکلا ت روانی آن پی برد.

Considering the high rate of cancer and leukemia among children and adolescents, we *may* recognize the significance of psychological treatment for preventing the psychological impacts of the disease. (Farsi Psych 2, p.118)

The distinction between epistemic and non-epistemic (root) meanings was not problematic in most cases. However, there were some instances in which such a distinction was not straightforward. Such inderterminate cases between epistemic and root modality were not considered as hedges in the study. The following two examples show how some lexical devices could be interpreted in either way:

(29) If these health-compromising behaviors continue into adulthood, they *may* also explain the impact of parental divorce on adult health. (Psych 4, p. 184)

(30) محرومیت از پدر یکی از شرایط خاص خانوادگی است که *میتواند* به عنوان یک متغیر مهم محیطی بطور مستقیم و غیر مستقیم اثرهای ویژه ای بر رشد عمومی و ابعاد مختلف رفتار کود ک به خصوص در زمینه سلا مت روانی، سلا مت جسما نی و عملکرد تحصیلی داشته باشد.

The loss of father in a family as a significant environmental variable is a critical determinant which *may* directly or indirectly have special impacts on the general growth and different aspects of the children, especially their mental and physical health, and their educational progress. (Farsi Psych 4, p. 68)

These two sentences can be paraphrased either into "it is possible that . . ." or "it is possible for. . . ." This shows that the modal auxiliary *may* in (29) and the main verb *توانستن* in (30) can be interpreted in either way in these two examples.

Main verbs were divided into two categories: "epistemic judgmental" verbs and "epistemic evidential" verbs. According to Hyland (1998), epistemic judgmental verbs "reflect appraisals by the speaker of the factive status of events" and are subcategorized into "speculation" and "deduction" (p. 120). Speculative verbs such as *indicate* and *suggest* show that the stated proposition is based on some conjecture. Deduction verbs like *estimate* and *calculate* show some "inferential reasoning or theoretical calculation" (p. 121).

Epistemic evidential verbs are the main verbs which "refer to evidentiary justification, either based on the reports of others, the evidence of the writer's sense, or the feasibility of matching evidence to goals" (p. 124). The subcategories of evidential verbs are quotative (e.g., *report*, *note*), sensory (e.g., *appear*, *seem*), and narrators (e.g., *attempt*, *seek*). A list of main verbs providing examples for these categories are provided in Appendix D.

This study focused just on lexical hedges and structural hedges were not taken into account. The decision whether the structural categories considered to have hedging functions proved to be more complex than lexical categories. For example, passive forms are the structural categories commonly mentioned to be connected to hedging in academic discourse. However, there is not general agreement over its true function. Lachowicz (1981) argues for the association of passive forms with hedging only when they occur and are accompanied with modals. Hyland (1998) who has advocated the hedging functions of the passive forms has provided some examples in which passive forms are accompanied by some other epistemic forms to create a hedging effect. So it is not clear if the hedging effect is due to the passive structure or the accompanying epistemic expressions. The following example is taken from Hyland (1998) to further illustrate this point:

(31) The BS fraction <u>is assumed to</u> originate from the center of the . . . . (Hyland, 1998, p. 172)

The co-occurrence of some other hedging expressions within the passive forms, like *assume* in (31), undermines their hedging function. There are some other studies which have attributed the function of passive to some other strategies rather than hedging. Varttala (2001) has argued that the remarkable high occurrence of passive forms in the

Method sections of RAs is an indication of writer's tendency "to emphasize what is important at a particular stage of research described" rather than reflecting the author's wish to avoid full commitment or hedging (p. 48).

Even though passive forms may carry some hedging value, the differentiation between the passives which are intended to produce such an effect and the ones which do not proved to be almost impossible. In addition to the difficulties mentioned for passive forms, one may also argue that the functions specified for this structural category in English may not be applicable to other languages, thus making this category not appropriate for contrastive studies. Therefore, this study focused only on lexical hedges and structural hedges were not taken into account.

After identifying the hedging forms in the two sets of data, the researcher provided possible contextual interpretations of the hedging devices to identify their functions. At this point, a distinction was made between two sub-categories of content-oriented hedges, namely accuracy-oriented and writer-oriented hedges, as two functions of hedges. According to Hyland (1998), the motivation for using these two hedges is the writer's interest in "stating propositional accord with reality" or "seeking self protection from the negative consequences of poor judgment" (p. 162). He further explains that the accuracy-oriented hedges refer to the "writer's desire to express proposition with greater precision" (p. 162). Writer-oriented hedges, according to him, are related to the degree of commitment that the writers wish to invest for their knowledge claims. In addition to the main category of content-oriented hedges, Hyland has also provided another main category, namely reader-oriented hedges. These mainly deal with the interpersonal purposes requiring writers to attend to the "social relationship between writer and reader"

(p. 177). According to Hyland, they also represent "conformity to research community expectations concerning deference due to colleagues in presenting information" (p. 178).

The main feature which distinguishes reader-oriented hedges from content-oriented hedges is the writers' presence and agentivity in the text which implies that writers' statement is a personal interpretation and they do not intend to generalize their proposition for interpersonal reasons, but rather invite the readership in making their conclusions and inferences. Due to the challenges faced in distinguishing accuracy and writer-oriented hedges as two sub-categories of content-oriented hedges from reader-oriented hedges, the latter type is not included in the categorization of the hedging functions.

Varttala (2001) has also argued that the line between reader-oriented hedges and the other two sub-categories of content-oriented hedges in Hyland's scheme is unclear. The scope of the notion of writer agentivity as well as attributing the hedging value to the choice of a personal subject are the main problematic points in Hyland's classification as mentioned by Varttala. He argues that the use of items showing writers' agentivity such as *I, we, my*, and *our* may simply be a "means of indicating where the focus is on the actions of the authors as opposed to other researchers in the same field" rather than showing epistemic qualification (pp. 88-89). The following examples taken from the English data of the study are provided to show this point:

(32) By examining the pathways through which divorce or death impacts well-being in mid-life, *we* may be able to intervene and help children change negative behaviors and interaction styles before they become long-term problems. (Psych 4, p. 189)

(33) Given that *we* reasoned an automatic nature to the hostile thoughts sampled in the HAT Scale, and *we* asked *our* research participants to focus on their past week, the present instructions tapped a set that is somewhere beyond state ("right now"), but not quite an enduring trait. (Psych 3, p. 488)

In the above examples, the use of the pronoun *we* by no means can show epistemic qualification, but rather they can be either interpreted as a generic term (32) or as referring to the doer of an action (33).

Another difficulty in coding the data was making a distinction between writer-oriented hedges and reliability hedges (a sub-category of accuracy-oriented hedges), which seemed to be overlapping. According to Hyland (1998), reliability hedges are mainly related to the writer's desire to "clarify the state of knowledge", whereas writer-oriented hedges act as a shield for the writer against any probable falsification of their assertion (p. 167). The classification proposed by Hyland assumes different functions for the epistemic main verbs and modal verbs, namely writer-oriented and reliability hedges. In order to distinguish the appropriate function of these expressions, some other features in the context, such as their co-occurrence with some other epistemic words which could imply either of functions were taken into account. Therefore, the lexical clues have been the main criteria for determining the appropriate epistemic function of these words. For example, the co-occurrence of the epistemic verb *appear* with *probably* in (34) is interpreted as a reliability (accuracy-oriented) hedge, whereas the occurrence of epistemic verb *appear* in an empty subject sentence, like (35), is interpreted as a writer-oriented hedge.

(34) It would then *appear* that the infecting bacterial load is high and the exposure was *probably* repeated over time because of . . . . (Med 1, p. 210)

(35) It *appears* that parental divorce lead to lower education and income attainment . . . . . (Psych 4, p. 188)

Hyland's (1998) distinction for writer-oriented against accuracy-oriented (reliability) hedges is based on the type of claim. He states that "writer-oriented hedges are often associated with higher level claims than accuracy-oriented ones" (p. 170). This means that when the writer is making claims regarding the major findings of the study (higher level claims), the associated hedges with this type of claim are considered as writer-oriented hedges. In contrast, the hedges used with lower level claims or minor findings of the study are considered as accuracy-oriented hedges. However, such a distinction was not practical and useful in analyzing the data of this study. Drawing a distinction between major findings (higher level claims) and the minor issues which are in the periphery of the research (lower level claims) proved not to be difficult. However, there were some other claims falling between these two categories. For example, the claims made regarding the previous studies or the methodology of research fall somewhere between the main two categories (high and low level claims), hence making such a distinction hard to apply. Varttala (2001) has also reported this problem with Hyland's scheme in his study.

The following Table provides some examples from the accuracy-oriented and writer-oriented hedges of this study. The categories and subcategories provided in Table 1 are taken from Hyland (1998, p. 186). The examples are selected from the English RAs of the study.

TABLE 1
Devices Used to Express Accuracy-oriented and Writer-oriented Hedging Functions
(continued on the next page)

Accuracy-oriented	**Example**
Attribute type	
Precision adverbs: content disjuncts	Their use is associated with hypotension, electrolyte abnormalities, worsening renal function, and possibly increased mortality. (Med 4, pp. 1963-1964).
style disjuncts	Furthermore, increasing fiber loading and fiber length generally increases the toughness, ... (Chem 1, p. 944)
downtoners	As a consequence, phenolic foam has rarely been used as a core material in . . . . (Chem 1, p. 941)
Reliability type	
Epistemic lexical verbs	It would then appear that the infecting bacterial load is high and the exposure was probably repeated over time because of . . . . (Med 1, p. 210)
Modal verbs	Clearly, parental death and divorce have the potential to impact social relationships which otherwise might buffer the effects of future stresses. (Psych 4, p. 184)
Epistemic adjectives	. . . Axis I disorders other than depression are also likely to coexist with personality disorders. (Psych 2, p. 172)
Epistemic nouns	Given this possibility, we have initiated a detailed investigation into the use of this approach for preparing epoxidation catalysts based on titanium. (Chem 2, p. 8381)
Content disjunct adverbs	The observed catalytic properties of these materials presumably reflect the high concentration of isolated, tetrahedral titanium sites . . . . (Chem 2, p. 8381)
Limited knowledge	The nature of the initial instability is unclear, but with a suitable matrix it . . . . (Chem. 4, p. 1438)

Writer- oriented	Example
Epistemic lexical verbs: judgmental	The present study suggests that loss or separation of parents in childhood does have a negative impact on health problems and . . . . (Psych 4, p. 188)
evidential	These fragments were found to attach to the GCC, as well as to the impure clay particles, but did not seem to fully cover the surface of the particles. (Chem. 3, p. 2450)
Impersonal expressions: passive voice	These results suggest that prominent neutrophilic infiltrate in humans may be caused by previous exposure to H. pylori antigens. (Med 1, p. 211)
abstract rhetors	The coefficients of variability in excess of .20 suggest high variability across respondents. (Psych 3, p. 489)
empty subjects	It appears that parental divorce lead to lower education and income attainment. . . . (Psych 4, p. 188)
Modal verbs thematic epistemic device	This may help explain the low maximum loading of titanium onto . . . . (Chem 2, p. 8382)
attribution to literature	Discriminant analysis may also be more appropriate for investigation nonlinear relations (Huberty, 1994). (Psych 2, p. 171)
Impersonal reference to method model experimental conditions	Although the measure appear reliable and valid, the use of multiple informants (e.g., teachers, parents) should provide a more complete assessment. (reference to method) (Psych 1, p. 180)

Another difficulty with coding the data was the level of knowledge required to comprehend fully the academic texts not related to the researcher's field. To remove this difficulty, experts from the fields were contacted to discuss the content of scientific RAs, especially medicine and chemistry. This procedure was undertaken to raise the

researcher's general understanding, as a non-specialist reader, of the content of these academic texts. For example, sentence (36) below shows that having some background information regarding the known and effective treatments of helicobacter pylori will help the readers to determine the epistemic status of توا نستن (may) in example (36).

(36) . . . ریشه کنی هلیکو باکتر پیلوری با رژیمها ی مختلف *میتوانند* سرعت بهبودی زخم را بالا برده و میزان بروز عود زخم را کاهش دهد.

> The eradication of helicobacter pylori with different treatment regimens *may* increase the healing speed and reduce the infection (Farsi Med 3, p. 31).

The expert confirmed that the use of different therapy regimens for eradicating helicobacter is a well-known treatment. Therefore, the verb توا نستن (may) is considered to be used in its root meaning. This means that this verb is used to indicate the feasibility of an event in terms of natural facts rather than showing uncertainty or possibility.

In order to check the reliability of the data coding, two other raters coded some of the RAs in the study. One native speaker of English and one native speaker of Farsi coded 15 % of the data separately to establish an inter-rater reliability value. Two Introduction and two Discussion sections from each set of the data in the study (English and Farsi) were randomly selected and the objectives of the study as well as the data coding procedures, the coding scheme and the lists of hedging devices were discussed with the two coders. Since none of the coders were specialists in the selected disciplines of the study, it could be assumed that all the coders, including the main researcher, had a similar level of knowledge regarding the fields of RAs. Each rater reported three scores for each rhetorical section (12 scores all together). These three numbers indicated the frequency of all hedging forms, accuracy-oriented hedges and writer-oriented hedges in each rhetorical section. The 12 scores reported by each rater were correlated with the

results found by the main researcher using MINITAB Release 14 software. The values for inter-rater reliability for the frequency of hedging in English and Farsi RAs were .87 and .92, respectively. These two values show reasonable amount of reliability in coding the data of this study.

The incidence of forms and functions of hedging were recorded separately for the two languages, three disciplines, and the Introduction and Discussion sections of RAs. The frequency of hedging forms in this study is calculated per "word." Due to the difficulty and impracticality of using T-unit, clause, etc. as the unit of measurement, the majority of the studies conducted in this area have applied "word" as the unit of showing the distribution of hedging devices in the study (Butler, 1990; Coates, 1983; Holmes, 1988; Hyland, 1998, 1999; Varttala, 2001; Yang, 2003). Since these units, such as clause, may have different sizes, hence containing different number of words, they may not provide a consistent means for measurement.

In order to show the distribution of hedging forms across languages, disciplines and also between the two rhetorical sections of the RAs, the researcher decided to consistently use a standardized size of 2,000 words to show the frequency of hedging devices across disciplines and rhetorical sections of RAs. Since the size of RAs in each discipline and across Introduction and Discussion sections varied, converting the raw scores into meaningful figures and calculating the frequency of hedging per 2,000 words provides a basis for comparison. The scale of 100 was avoided since the scale of 2,000 will provide bigger numbers which can show the differences more distinctively.

The procedure for calculating the relative frequency per 2,000 words is as follows: first the raw frequency (count) of the device in the intended section of the RA(s)

in the specified language was determined. The raw frequency (F) was multiplied by 2,000 and the result was divided by the total number of words in the specified section of RAs. For example, in order to calculate the relative frequency of the total hedging forms per 2,000 words in the Farsi RAs, first the raw frequency of the total hedging forms in all Farsi RAs was determined (total number of hedges = 258). Then this number was multiplied by 2,000 and the result was divided by 19,872 (total number of words in Farsi RAs). According to this procedure, the relative frequency of the hedging forms in all Farsi RAs is 25.97. In order to show the final results in the tables, the figures were rounded off to the first two decimals. This means that if the third decimal was 5 or above it, the value of .01 was added to the second decimal in the figure.

The MINITAB Release 14 for Microsoft Windows software has been utilized to compare the proportions of two samples and also to calculate the correlation coefficient used for estimating inter-rater reliability value. This software was mainly used to see if there is statistical difference between the distribution of hedging forms or functions in two different rhetorical sections, three disciplines, and the two languages.

Chapter Four

ANALYSIS AND RESULTS

To analyze the data, first the number and frequency of words in each section of RAs were calculated. Table 2 below provides the frequency of the words in RAs of the three disciplines in English and Farsi across Introduction and Discussion sections.

TABLE 2
Number of Words in English and Farsi RAs across the Two Sections and Disciplines

Discipline	**Medicine**		**Chemistry**		**Psychology**	
Rhetorical Section	English	Farsi	English	Farsi	English	Farsi
Introduction	1,302	962	2,672	2,103	4,302	6,469
Discussion	4,431	4,305	8,651	1,775	4,625	4,258
Total	5,733	5,267	11,323	3,878	8,927	10,727

Table 2 shows that the number of words in English chemistry RAs is 11, 323 followed by psychology (8,927), and medicine (5,733), respectively. The Psychology RAs in Farsi contain 10,727 words followed by medicine (5,267), and chemistry (3,878). The addition of the total number of words in RAs shows that English and Farsi RAs have 25, 983 and 19, 872 words, respectively

4.1 Distribution of Forms of Hedging

4.1.1 Hedging Forms across Languages and Disciplines

The frequency of hedging forms was calculated and distributed based on their categories. The three main categories of "main verbs, non-main verbs, and modal

auxiliaries (just used for English RAs)" were used to show the distribution of hedging forms in this study. Main verbs were further divided into "judgmental and evidential" verbs. Non-main verbs were also sub-categorized into "adverb, adjective, and noun". Table 3 presents the results of the hedging categories across three disciplines in English.

TABLE 3
Frequency of Hedging Forms in English RAs

Form of Hedge	Medicine		Chemistry		Psychology	
	F	Per 2,000	F	Per 2,000	F	Per 2,000
Main Verb	21	7.33	63	11.13	58	12.99
Judgmental	11	3.84	35	6.18	35	7.84
Evidential	10	3.49	28	4.95	23	5.15
Non-main Verb	64	22.33	111	19.60	74	16.58
Adverb	30	10.47	73	12.89	36	8.07
Adjective	26	9.07	33	5.83	23	5.15
Noun	8	2.79	5	0.88	15	3.36
Modal Auxiliary	29	10.12	33	5.83	82	18.37
Total	**114**	**39.77**	**207**	**36.56**	**214**	**47.94**

* The figures in this table are rounded off to the first two decimals
Key to Table: F = Frequency

As Table 3 shows, the frequency of hedging in English psychology RAs is 47.94 (n = 214) per 2,000 words followed by medicine (39.77, n = 114) and chemistry (36.56, n = 207). The result of the two-proportion sample test (MINITAB Release 14 software) showed that the difference between the proportion of total hedges recorded in English psychology and chemistry RAs is statistically significant (Z= 2.77, $p < .05$).

The three disciplines show different tendencies for hedging categories. Main verbs are mostly used in psychology RAs (12.99, n = 58) followed by chemistry (11.13, n = 63), and medicine (7.33, n = 21) RAs per 2,000 words. The two sub-categories of judgmental and evidential verbs are also mainly present in psychology RAs. The highest incidence of epistemic adverbs is in chemistry RAs (12.89, n = 73) followed by medicine

(10.47, $n = 30$), and psychology (8.07, $n = 36$) RAs per 2,000 words. The results of this study support Varttala's (2001) findings which have shown adverbials as the most frequent hedging devices in technology (11.14 per 2,000 words) as compared to medicine and economics RAs. Hyland (1996a) has reported the frequency of adverbs as the second rank after main verbs in English RAs. This study shows the rank of adverbs in English RAs as third after modal auxiliaries and main verbs.

As for epistemic adjectives, medicine RAs show the highest frequency of this category (9.07, $n = 26$) followed by chemistry (5.83, $n = 33$), and psychology (5.15, $n = 23$). "Possible" as an expression belonging to adjective category has both root and epistemic meanings which were distinguished by using the familiar phrases "possible for" and "possible that." The distribution of epistemic *possible* in the corpus was half of the total (total $n = 16$) in the English RAs. The incidence of epistemic nouns in English RAs is not very high. The English RAs, in general, favor other epistemic devices over epistemic nouns.

The results of Table 3 also show that there is a considerable disciplinary variation in the distribution of modal auxiliaries in English RAs. The occurrence of epistemic modal auxiliaries in English psychology RAs is 18.37 ($n = 82$) followed by medicine (10.12, $n = 29$) and chemistry (5.83, $n = 33$) RAs per 2,000 words. The results of the two-proportion sample test (MINITAB Release 14 software) showed that the difference between the proportion of epistemic modals recorded in psychology and medicine ($Z = 3.00, p < .05$), and psychology and chemistry ($Z = 5.55, p < .05$) was statistically significant.

Table 4 below exhibits the frequency of hedging forms in Farsi RAs and their incidence per 2,000 words.

TABLE 4
Frequency of Hedging Forms in Farsi RAs

Form of Hedge	Medicine		Chemistry		Psychology	
	F	Per 2,000	F	Per 2,000	F	Per 2,000
Main Verb	49	18.61	18	9.28	47	8.76
Judgmental	17	6.46	9	4.64	35	6.53
Evidential	32	12.15	9	4.64	12	2.24
Non-main Verb	38	14.43	29	14.96	77	14.36
Adverb	25	9.49	15	7.74	66	12.31
Adjective	0	0.0	1	0.52	0	0.0
Noun	13	4.94	13	6.70	11	2.05
Total	**87**	**33.04**	**47**	**24.24**	**124**	**23.12**

* The figures in this table are rounded off to the first two decimals
Key to Table: F = Frequency

As Table 4 shows, the incidence of hedging forms in Farsi medicine RAs is 33.04 (n = 87) per 2,000 words which is the highest among Farsi disciplines. Farsi chemistry and psychology RAs show a very close distribution to each other and follow medicine RAs with the frequency of 24.24 (n = 47) and 23.12 (n = 124) per 2,000 words, respectively.

The Farsi RAs, like English RAs, show different tendencies for hedging categories. Medicine RAs contain the highest amount of main verbs (18.61, n = 49) per 2,000 words followed by chemistry (9.28, n= 18) and psychology (8.76, n = 47). The highest amount of epistemic adverbs happens to be in Psychology (12.31, n = 66) followed by medicine (9.49, n = 25) and chemistry (7.74, n = 15) RAs per 2,000 words.

Contrary to English RAs, Farsi RAs favor epistemic nouns over epistemic adjectives. The highest incidence of epistemic nouns in Farsi RAs happens to be in

chemistry (6.70, $n = 13$) followed by medicine (4.94, $n = 13$), and psychology (2.05, $n = 11$) RAs per 2,000 words.

The difference found for the frequency of hedges in the three disciplines across the two languages could be somehow attributed to the lack of modal auxiliaries in Farsi. Table 4 shows that Farsi psychology RAs is the least hedged discipline among Farsi RAs. As Table 3 shows, the highest amount of modal auxiliaries happens to be in English psychology RAs. If one adds up the frequencies of the modal auxiliaries in the three English disciplines to their corresponding Farsi RAs, the pattern for the distribution of hedging forms in the three disciplines across languages will be similar.

The comparison of the total results presented in Table 3 and Table 4 shows that English RAs are more hedged than Farsi RAs. The relative frequency of total hedges in English RAs (41.18) compared to that of Farsi RAs (25.97) per 2,000 words shows that English RAs are 61.3 % more hedged than Farsi RAs. The relative frequency of total hedges for each language was calculated by using the total number of hedges in three disciplines in each language (e.g., the total number of hedges in English RAs, 114 + 207 + 214 = 535). This figure was multiplied by 2,000 and the result was divided by the total number of words in the related language (e.g., the total number of words in English RAs = 25, 983). The results of the two-proportion sample test (MINITAB Release 14 software) performed showed that the difference between the total proportion of hedges across all disciplines in English and Farsi RAs is statistically significant ($Z = - 6.38$, $p < .05$).

The lower incidence of hedges in Farsi compared to English indicates that Farsi is similar to some languages like Chinese (Yang, 2003), which are more assertive and use

fewer hedges compared to English. Moreover, it indicates that Farsi is different from some other languages like Finnish (see Crismore et al., 1993) and German (see Clyne, 1991) which make greater use of hedges compared to English. The results of Table 3 and Table 4 also show variations in the occurrence of epistemic categories. Among the non-main verb categories, the predominant occurrence of epistemic adverbs in both English and Farsi data was quite noticeable. Among the three disciplines, English chemistry RAs and Farsi psychology RAs showed the highest incidence of adverbs.

The distribution of adjectives and nouns is considerably lower than that of adverbs in both English and Farsi. The highest frequency of adjectives in English is 9.07 (n = 26) per 2,000 words in medicine RAs whereas this figure comes to 0.52 (n = 1) for Farsi chemistry RAs. Adjectives are highly preferred in English over nouns whereas they switch their roles in Farsi RAs.

An examination and comparison of the Table 3 and Table 4 shows the preference of the English writers to use "judgmental" verbs over "evidential" verbs. From the total number of judgmental verbs in the English RAs (n = 81), almost all of them are "speculative" (e.g., *indicate*, *suggest*, *propose*) rather than "deductive" (e.g., *estimate*, *calculate*). Hyland (1998) has suggested that such a tendency can indicate a writer's preference in taking a cautious position in the RAs, rather than emphasizing the evidence that is used to support them.

Table 4 shows that Farsi RAs do not always indicate the same preference as English writers in using "judgmental" verbs over "evidential" verbs. The relative frequency of evidential verbs in Farsi medicine RAs is 12.15 (n = 32) which happens to be higher than judgmental verbs (6.46, n = 17) per 2,000 words. The Farsi chemistry RAs

also show equal distribution for the two categories of verbs (4.64, n = 9) per 2,000 words. From the total number of evidential verbs (n = 53) in Farsi RAs, 38 of them are "quotative" verbs (گزارش کردن, *report*).

This indicates that Farsi writers make relatively greater use of previous research, but contrary to English writers, tend to use relatively fewer speculative judgmental verbs (e.g., *suggest, indicate, propose*) in their writing. There may be different explanations for this fact. One may assume that Farsi RA writers do not favor taking a stance against the claims made by other researchers in their studies. The other speculation which seems to conform to the data of this study is that the Farsi RA writers use a different degree of precision for their proposition. If we assume that Farsi writers tend to be more categorical and less speculative in their writing, then the existence of a lower number of hedging using judgmental verbs in Farsi RAs compared to English RAs can be partially accounted for.

4.1.2 Hedging Forms across Introduction and Discussion Sections

Table 5 shows the distribution of hedging forms across the two rhetorical sections of Introduction and Discussion in English and Farsi.

TABLE 5
Frequency of Hedging Forms across Introduction and Discussion Sections in English and Farsi RAs

Forms of Hedge	English				Farsi			
	Introduction		Discussion		Introduction		Discussion	
	F	Per 2,000	F	Per 2,000	F	Per 2,000	F	Per 2,000
Total	165	39.87	370	41.79	102	21.40	156	30.18

* The figures in this table are rounded off to the first two decimals
Key to Table: F = Frequency

The incidence of hedging forms in the Discussion sections of English and Farsi is 41.79 (n = 370) and 30.18 (n = 156) per 2,000 words, whereas frequencies for the Introduction sections happen to be 39.87 (n = 165) and 21.40 (n = 102), respectively. Table 5 shows that the Discussion sections of RAs in English and Farsi are more hedged than the Introduction sections. The comparison of distribution presented in Table 5 shows a bigger difference in the use of hedging forms in Introduction and Discussion sections of Farsi. The results of the two-proportion sample test (MINITAB Release 14 software) performed showed that the difference between the proportion of hedging forms in Farsi Introduction and Discussion sections was statistically significant (Z = -2.75, $p < .05$).

The higher distribution of hedges in the Discussion section supports the findings of previous studies which have shown Discussion section as more hedged than Introduction section (Hyland, 1998; Salager-Meyer, 1994; Varttala, 2001). One can explain that the different sections of an RA work towards various rhetorical functions and different linguistic features appear in the various sections to realize these functions.

Table 6 below illustrates a detailed distribution of hedging forms in Introduction and Discussion sections of English and Farsi medicine RAs.

TABLE 6
Frequency of Hedging Forms across Introduction and Discussion Sections in English and Farsi Medicine RAs

Form of Hedge	English				Farsi			
	Introduction		Discussion		Introduction		Discussion	
	F	Per 2,000	F	Per 2,000	F	Per 2,000	F	Per 2,000
Main Verb	3	4.61	18	8.12	4	8.32	45	20.91
Judgmental	3	4.61	8	3.61	1	2.08	16	7.43
Evidential	0	0.0	10	4.51	3	6.24	29	13.47
Non-main Verb	14	21.51	50	22.57	4	8.32	34	15.80
Adverb	7	10.75	23	10.38	4	8.32	21	9.76
Adjective	6	9.22	20	9.03	0	0.0	0	0.0
Noun	1	1.54	7	3.16	0	0.0	13	6.04
Modal Auxiliary	2	3.07	27	12.19				
Total	**19**	**29.19**	**95**	**42.88**	**8**	**16.63**	**79**	**36.70**

* The figures in this table are rounded off to the first two decimals
Key to Table: F = Frequency

Table 6 shows that the frequency of hedges in the Discussion section of English medicine RAs is 42.88 ($n = 95$) versus 29.19 ($n = 19$) per 2,000 words in the Introduction section. The Discussion section of Farsi medicine RAs shows a frequency of 36.70 ($n = 79$) versus 16.63 ($n = 8$) per 2,000 words in the Introduction section. The total relative frequencies presented in Table 6 indicate that the Discussion sections in both English and Farsi medicine RAs are more hedged than the Introduction sections. However, this difference in Farsi RAs is more than that in English RAs. The results of the two-proportion sample test (MINITAB Release 14 software) performed showed that the difference between the proportion of hedging forms in the Farsi medicine Introduction and Discussion sections was statistically significant ($Z = 2.82$, $p < .05$).

TABLE 7
Frequency of Hedging Forms across Introduction and Discussion Sections in English and Farsi Chemistry RAs

Form of Hedge	English				Farsi			
	Introduction		Discussion		Introduction		Discussion	
	F	Per 2,000	F	Per 2,000	F	Per 2,000	F	Per 2,000
Main Verb	11	8.23	52	12.02	7	6.66	11	12.39
Judgmental	3	2.25	32	7.40	4	3.80	5	5.63
Evidential	8	5.99	20	4.62	3	2.85	6	6.76
Non-main Verb	35	26.20	76	17.57	12	11.41	17	19.15
Adverb	21	15.72	52	12.02	7	6.66	8	9.01
Adjective	11	8.23	22	5.09	1	0.95	0	0.0
Noun	3	2.25	2	0.46	4	3.80	9	10.14
Modal Auxiliary	2	1.50	31	7.17				
Total	**48**	**35.93**	**159**	**36.76**	**19**	**18.07**	**28**	**31.55**

* The figures in this table are rounded off to the first two decimals
Key to Table: F = Frequency

Table 7 shows that the frequencies of hedging forms in the Discussion and Introduction sections of English chemistry RAs are 36.76 (n = 159) and 35.93 (n = 48) per 2,000 words, respectively. The Discussion section of Farsi chemistry RAs exhibit a frequency of 31.55 (n = 28) versus 18.07 (n = 19) for the Introduction section. As for the results presented in Table 6, the Discussion sections of both English and Farsi chemistry RAs are more hedged than their corresponding Introduction sections. However, the difference between the frequency of hedges in English Discussion and Introduction sections is not very big.

TABLE 8
Frequency of Hedging Forms across Introduction and Discussion Sections in English and Farsi Psychology RAs

Form of Hedge	English				Farsi			
	Introduction		Discussion		Introduction		Discussion	
	F	Per 2,000	F	Per 2,000	F	Per 2,000	F	Per 2,000
Main Verb	30	13.95	28	12.11	32	9.89	15	7.05
Judgmental	18	8.37	17	7.35	22	6.80	13	6.11
Evidential	12	5.58	11	4.76	10	3.09	2	0.94
Non-main Verb	33	15.34	41	17.73	43	13.29	34	15.97
Adverb	16	7.44	20	8.65	36	11.13	30	14.09
Adjective	9	4.18	14	6.05	0	0.0	0	0.0
Noun	8	3.72	7	3.03	7	2.16	4	1.88
Modal Auxiliary	35	16.27	47	20.32				
Total	**98**	**45.56**	**116**	**50.16**	**75**	**23.19**	**49**	**23.02**

* The figures in this table are rounded off to the first two decimals
Key to Table: F = Frequency

According to Table 8, the Discussion and Introduction sections of English psychology RAs show a frequency of 50.16 (n = 116), and 45.56 (n = 98) per 2,000 words, respectively. The Farsi psychology RAs, as shown in Table 8, are the only cases in which the frequency of hedges in the Introduction section is 23.19 (n = 75), and with that is slightly larger than that of the Discussion section (23.02, n = 49) per 2,000 words. The performance of the two-proportion sample test (MINITAB Release 14 software) did not show significant difference between these two sections for English (Z = - 0.71, p < .05) and Farsi (Z = 0.04, p < .05) psychology RAs.

The results presented in Tables 6, 7, and 8 show that the medical RAs in English and Farsi exhibit the greatest difference in holding hedges in Introduction and Discussion sections. According to these Tables, the least difference for frequency of hedges between the two rhetorical sections in English is found in chemistry RAs and for Farsi is in psychology RAs.

4.2 Distribution of Functions of Hedging

4.2.1 Hedging Functions across Languages and Disciplines

The two main functions of hedging, namely accuracy-oriented and writer-oriented hedges were determined and counted in the data of this study. The main function of accuracy-oriented hedges is to express propositions with greater precision and writer-oriented hedges mostly function as a protection for a writer's face.

Table 9 below presents the distribution of these two functions of hedging across three disciplines in English RAs.

TABLE 9
Frequency of Hedging Functions in English RAs

Function of Hedge	Medicine		Chemistry		Psychology	
	F	Per 2,000	F	Per 2,000	F	Per 2,000
Accuracy-oriented	55	19.19	73	12.89	81	18.15
Writer-oriented	21	7.33	32	5.65	56	12.55
Total	**76**	**26.51**	**105**	**18.55**	**137**	**30.69**

* The figures in this table are rounded off to the first two decimals
Key to Table: F = Frequency

According to Table 9, English psychology RAs show an incidence of 30.69 (n = 137) per 2,000 words for the hedging functions, which is the highest among the three English disciplines. The relative frequency of hedging functions for English medicine and chemistry RAs happens to be 26.51 (n = 76), and 18.55 (n = 105), respectively.

In terms of the two main categories of hedging functions, psychology and chemistry RAs show a frequency of 12.55 (n = 56) and 5.65, (n = 32) per 2,000 words for writer-oriented hedges, respectively. They exhibit the highest and the lowest occurrence of this function in English RAs. This may be accounted for by considering the more tentative nature of psychology as a discipline which requires writers to use more writer-oriented hedges to protect their face against any possible falsification of their statements.

The writers in chemistry, on the other hand, can directly measure and manipulate the variables of the study which reduces the falsification of their claims.

TABLE 10
Frequency of Hedging Functions in Farsi RAs

Function of Hedge	Medicine		Chemistry		Psychology	
	F	Per 2,000	F	Per 2,000	F	Per 2,000
Accuracy-oriented	28	10.63	23	11.86	56	10.44
Writer-oriented	21	7.97	11	5.67	10	1.86
Total	**49**	**18.61**	**34**	**17.53**	**66**	**12.31**

* The figures in this table are rounded off to the first two decimals
Key to Table: F = Frequency

Table 10 shows that Farsi medicine RAs contain the highest incidence of hedging functions (18.61, $n = 49$) followed by chemistry (17.53, $n = 34$) and psychology (12.31, $n = 66$) RAs per 2,000 words. In contrast to English RAs, psychology RAs happen to have the lowest frequency of writer-oriented hedges (1.86, $n = 10$) among Farsi disciplines followed by chemistry (5.67, $n = 11$), and medicine (7.97, $n = 21$) RAs per 2,000 words. The three disciplines in Farsi do not show great difference in their incidence of accuracy-oriented hedges.

Table 9 and Table 10 illustrate that the incidence of the two functions of hedging namely accuracy-oriented and writer-oriented in English RAs is higher than in Farsi RAs. The relative frequency of these two functions in English is 24.48 ($n = 318$) versus 15.00 ($n = 149$) per 2,000 words in Farsi. This is consistent with the results found for hedging forms presented in section 4.1 of this chapter. These Tables also show that the incidence of accuracy-oriented hedges in both English and Farsi is higher than writer-oriented hedges. The relative frequency of accuracy-oriented and writer oriented hedges in English is 16.09 ($n = 209$) and 8.39 ($n = 109$) per 2,000 words, respectively. The relative distribution of accuracy-oriented hedges in Farsi (10.77, $n = 107$) is also higher than that

of writer-oriented (4.23, $n = 42$). The performance of the two-proportion sample test showed significant difference for the distribution of accuracy versus writer-oriented hedges in both English ($Z = 6.19, p < .05$) and Farsi ($Z = 5.34, p < .05$).

Disregarding the general higher frequency of the hedging functions in English, a comparison of Table 9 and Table 10 shows that the English writers favor writer-oriented hedges, as compared to accuracy-oriented hedges, more than Farsi writers. This difference can be accounted for by assuming greater tendency for English writers to have more generalization in the Discussion section of the RAs. It can also be interpreted that Farsi writers do not prefer to state higher level claims in the Discussion section which will lead to using more writer-oriented hedges.

4.2.2 Hedging Functions across Introduction and Discussion Sections

Table 11 shows the distribution of hedging functions across the two rhetorical sections of Introduction and Discussion in English and Farsi.

TABLE 11
Frequency of Hedging Functions across Introduction and Discussion Sections in English and Farsi

Function of Hedge	English				Farsi			
	Introduction		Discussion		Introduction		Discussion	
	F	Per 2,000	F	Per 2,000	F	Per 2,000	F	Per 2,000
Accuracy-oriented	72	17.40	137	15.47	52	10.91	55	10.64
Writer-oriented	34	8.22	75	8.47	14	2.94	28	5.42

* The figures in this table are rounded off to the first two decimals
Key to Table: F = Frequency

Table 11 shows that the frequency of accuracy-oriented hedges in English Introduction and Discussion sections is 17.40 ($n = 72$), and 15.47 ($n = 137$) per 2,000 words, respectively. The incidence of writer-oriented hedges in English Introduction and

Discussion sections is 8.22 (n = 34), and 8.47 (n = 75) per 2,000 words, respectively. Table 11 shows that the incidence of accuracy-oriented hedges in both English and Farsi RAs is higher than writer-oriented hedges. It also shows that the Discussion sections in both English and Farsi contain more writer-oriented hedges and less accuracy-oriented hedges compared to their corresponding Introduction sections. The relative frequency of accuracy-oriented hedges in Farsi Introduction and Discussion sections is 10.91 (n = 52), and 10.64 (n = 55) per 2,000 words, respectively. However, the density of writer-oriented hedges for the same sections in Farsi is switched. The incidence of writer-oriented hedges in Farsi Introduction is 2.94 (n = 14), which is less than that of Discussion section (5.42, n = 28).

The different functions of the rhetorical sections of the RAs can account for such a difference. The Introduction section of RAs is mainly concerned with establishing a basis for the research. This section of the RAs normally does not contain the main generalizations that are made by the writer. Stating generalizations usually requires the writers to use writer-oriented hedges to shield themselves against possible falsification of their claims. Tables 12, 13, and 14 which follow illustrate a detailed distribution of accuracy-oriented and writer-oriented hedges across Introduction and Discussion section in the three disciplines in English and Farsi.

TABLE 12
Frequency of Hedging Functions across Introduction and Discussion Sections in English and Farsi Medicine RAs

Function of Hedge	English				Farsi			
	Introduction		Discussion		Introduction		Discussion	
	F	Per 2,000	F	Per 2,000	F	Per 2,000	F	Per 2,000
Accuracy-oriented	8	12.29	47	21.21	8	16.63	20	9.29
Writer-oriented	3	4.60	18	8.12	5	10.40	16	7.43
Total	**11**	**16.90**	**65**	**29.34**	**13**	**27.03**	**36**	**16.72**

* The figures in this table are rounded off to the first two decimals
Key to Table: F = Frequency

Table 12 shows that the incidence of accuracy-oriented and writer-oriented hedges in the English Introduction section is 12.29 (n = 8), and 4.60 (n = 3), respectively. The frequency of these two hedging functions in the corresponding Discussion section is 21.21 (n = 47), and 8.12 (n = 18), respectively. The ratio of the two hedging functions in both English and Farsi Introduction and Discussion sections shows a greater tendency for Introduction sections to hold accuracy-oriented hedges. This also shows the greater tendency for Discussion section to hold writer-oriented hedges.

TABLE 13
Frequency of Hedging Functions across Introduction and Discussion Sections in English and Farsi Chemistry RAs

Function of Hedge	English				Farsi			
	Introduction		Discussion		Introduction		Discussion	
	F	Per 2,000	F	Per 2,000	F	Per 2,000	F	Per 2,000
Accuracy-oriented	24	17.96	49	11.33	12	11.41	11	12.39
Writer-oriented	4	2.99	28	6.47	5	4.76	6	6.76
Total	**28**	**20.96**	**77**	**17.80**	**17**	**16.17**	**17**	**19.15**

* The figures in this table are rounded off to the first two decimals
Key to Table: F = Frequency

The results presented in Table 13 show similar patterns and tendencies in the distribution of hedging functions in the two rhetorical sections of RAs as shown in Table 12. The frequency of writer-oriented hedges in English Introduction and Discussion

sections is 2.99 (n = 4), and 6.47 (n = 28), respectively. The frequency of this function in the two sections of Farsi chemistry RAs is 4.76 (n = 5), and 6.76 (n = 6). Comparing these figures with the ones presented in Table 12, one may conclude that the English and Farsi chemistry RAs show to favor less writer-oriented hedges in both the Introduction and Discussion sections compared to medicine RAs. This difference can be accounted for by considering the different nature of these two disciplines. The following Table exhibits the results of hedging function in psychology RAs.

TABLE 14
Frequency of Hedging Functions across Introduction and Discussion Sections in English and Farsi Psychology RAs

Function of Hedge	English				Farsi			
	Introduction		Discussion		Introduction		Discussion	
	F	Per 2,000	F	Per 2,000	F	Per 2,000	F	Per 2,000
Accuracy-oriented	40	18.60	41	17.73	32	9.89	24	11.27
Writer-oriented	27	12.55	29	12.54	4	1.24	6	2.82
Total	**67**	**31.15**	**70**	**30.27**	**36**	**11.13**	**30**	**14.09**

* The figures in this table are rounded off to the first two decimals
Key to Table: F = Frequency

According to Table 14, the incidence of writer-oriented hedges in the Introduction and Discussion sections of English psychology RAs is 12.55 (n = 27), and 12.54 (n = 29), respectively. This shows that English psychology RAs favor writer-oriented hedges more than other disciplines. However, the results presented in Table 14, in general, supports the general pattern shown in Table 12 and Table 13.

The frequency of writer-oriented hedges in Farsi RAs in the Introduction and Discussion sections is 1.24 (n = 4), and 2.82 (n = 6) per 2,000 words, respectively. This shows that Farsi psychology RAs, contrary to English psychology RAs, do not favor writer-oriented hedges very much.

This chapter presented the results of this study. It was shown that English RAs exhibited more hedging forms than Farsi RAs. Discussion sections of RAs in English and Farsi contained more hedging forms than the Introduction sections. Discussion sections also contained more writer-oriented hedges compared to Introduction sections. Some disciplinary differences were also found in terms of the distribution of hedging forms and functions. In the next chapter, the discussion and conclusions of the study will be presented.

Chapter Five

CONCLUSIONS AND DISCUSSION

This chapter discusses the conclusions of this study and provides a comparison to findings of other studies. The pedagogical implications of this study will be discussed in the last section of this chapter.

The conclusions and discussion will address the research questions of the study as summarized here:

1. Those related to the distribution of hedging forms and functions in English and Farsi data (research questions 1 and 4).
2. Those which deal with the distribution of hedging forms and functions across Introduction and Discussion sections of RAs (research questions 3 and 6).
3. Those which are concerned with the cross-disciplinary distribution of hedging forms and functions in both English and Farsi data (research questions 2 and 5).

5.1 Hedging in English and Farsi

The distribution of the hedging forms and functions used in the English and Farsi data shows that the two languages have different rhetorical preferences. English RAs exhibited 61.3 % more hedging forms than Farsi RAs. English RAs also contained more hedging functions than Farsi RAs. These results suggest that English writers are more tentative in putting forward claims and in rejecting or confirming the ideas of others than Farsi writers. In other words, the Farsi writers tend to "overstate", whereas English scholars "understate."

The findings of this study support other studies which have shown variations across languages. Farsi writers, like Chinese writers (Yang, 2003), favor less detachment to

their ideas compared to English writers. In contrast, German (Clyne, 1991) and Finnish (Crismore et al., 1993) scholars showed they use considerably more epistemic devices compared to English and some other languages.

In order to account for such a difference in the frequency of hedges in English and Farsi, an explanation can be provided by referring to the significance for using these devices in academic discourse. Hedges can have both epistemological and interpersonal significance in academic discourse. The epistemological use of hedges, as stated by Hyland (1998), refers to the ways through which they are used and manipulated by writers to express their judgment regarding the truth value of the claims. The writers, through using hedging, can indicate that the proposition may not be categorically accurate. The main motivation for the writers to indicate accuracy can be either to specify precision or to shield themselves against any criticism. However, the writers may also use hedges to make their assertion less precise when providing exact information is not important. The latter case happens when writers discuss issues which are well accepted by the other members of the community. The ultimate goal of the writers is to promote their claim as a fact, and to ensure that it is interpreted as a part of accepted knowledge by their scholarly peers.

The paradox of writers' desires to persuade their readers to accept their assertion as a fact and using hedges that show the writer's lack of full confidence in the factuality of their statements can be resolved by looking at the interpersonal functions of hedging. Hyland (1998) states that the qualification of the proposition can also "serve a suasive function by meeting the affective expectations of a scientific audience" (p. 62). The use of appropriate hedging can open a dialog between the writers and readers, which leads to

the evaluation of the assertion and its acceptance or rejection by the readers. As the members of a discourse community, it is always the readers or other researchers who will judge and decide the factuality of a claim. Hence, one of the motives for writers in using hedging is to establish interpersonal relationships. This means that writers take the readers' reaction into account when using hedging devices.

The significant role of readers and audience in academic discourse can receive more support by the abundant use of metalanguage for explicitly organizing the English text. The use of devices for orienting the readers and providing the information regarding the organization of the text, and how they relate to each other, supports the idea that the English writers show a high awareness regarding the readers and how much they are present in the writers' mind during the process of writing. Mauranen (1993) has also emphasized English writers' awareness towards their readers through devices that anticipate what is to follow and how text segments relate to each other.

Hinds (1987) has made a distinction between reader versus writer responsibility languages. He states that in some languages such as English "the person primarily responsible for effective communication is the speaker" or writer, while in some other languages like Japanese "the person primarily responsible for effective communication is the listener" or the reader (p. 143). Hinds emphasizes that the communication process in these two types of languages is different. Whereas English readers expect and require the writers to provide enough landmarks of coherence and appropriate transition statements for more clarity, the Japanese writers assume that "it is reader's responsibility to determine the relationship between any part of an essay as a whole" (p. 146).

Hinds (1990) in his later article, as cited by Connor (1996), argues that the major task of the writers in reader-responsible languages such as Japanese and Chinese is not necessarily to convince readers. The task of the writer is mainly to make readers to think for themselves and make their own conclusions.

Accepting the fact that there are different communication processes involved in languages, we can assume that in a language like Farsi, the main concern of the writers is the propositional content of their text rather than the affective nature of their discourse. The linguistic knowledge of the researcher of this study, a native speaker of Farsi, testifies to this fact regarding Farsi. This means that this kind of language should contain little metadiscourse and writers are not much concerned with leading and orienting the readers. The extent of reader's involvement in the writer's mind within the process of writing may vary from a language like English, in which writers are always very conscious of the reader's presence. Assuming this, the variation in the distribution of hedging devices in English and Farsi can be partially accounted for.

As it was mentioned earlier, readers and audience are a locus of attention when writers, through using hedges, try to open negotiation with them and therefore increase the chance of getting their idea accepted. If we assume that the extent of readers' involvement in the minds of English and Farsi writers varies, then finding different amounts of hedges, which are an indicator of interpersonal relationship between these two languages is quite understandable.

This does not mean that the socio-cultural aspects of academic discourse in which scientific hedging occurs can be ignored in interpreting the distribution of hedges across cultures and languages. The limitations imposed by the discourse community on

languages and disciplines in terms of how information should be presented and how much writers should stick to their claim has to be taken into account. The discussion on disciplinary variation presented in 5.3 will show that both language and discipline can have an interactional effect on the use of hedging. The next section presents the discussion concerning the distribution of hedges across the two rhetorical sections of RAs.

5.2 Hedging in Introduction and Discussion Sections

This study showed that the distribution of hedging forms and functions in the RAs are not evenly distributed between different rhetorical sections. The Discussion sections of RAs in English and Farsi generally contained more hedging forms than the Introduction sections did (41.79 vs. 39.87 in English and 30.17 vs. 21.39 per 2,000 words in Farsi). This result is consistent with the findings of Varttala (2001) on hedging in three disciplines, Hyland's (1998) study on the distribution of hedging in biology RAs, Salager-Meyer's (1994) research on medical RAs, and Vassileva's (2001) study on the English and Bulgarian RAs.

Variation in hedging within the rhetorical sections of an RA can reflect the different purposes of the rhetorical sections of an RA. Swales (1990) in his CARS model for RA Introductions states that the main concern of the Introduction section of an RA is to create a research space in which to locate the study. In order to meet this end, the writers try to "establish a territory" by reviewing the previous works and "establish a niche" by referring to the gap and shortcomings which exist in the previous works. West (1980) states that the main rhetorical function of the Introduction is to justify the reason for investigation. The writers make this justification through showing the problem or gap

in previous research and emphasizing the significance of their own work. Swales and West assume the same main function for the Introduction sections of RAs. In their frameworks, the use of previous research for showing the significance of the study is emphasized.

In the articles selected for this study, the writers try to introduce their work in the Introduction sections of the RAs. In order to introduce and justify the conduct of their research, writers usually refer to the previous studies to show the shortcomings or the flaws which exist with different aspects of the study (e.g., methodology or interpretation of the results). At the same time, they are aware that being too assertive while discussing the others' research boldly may not be a conventional style in academic context. Hedging as a functional category helps the researchers to take a cautious approach in introducing their views towards the other studies. Hedging also indicates that writers know the rules of conduct by showing concern regarding the face of the others. The neglect for this may cause confrontation with the other members of the community whose work has been criticized.

The Discussion section in both English and Farsi RAs contained more hedges compared to the Introduction section. The Discussion section "mirror-images the Introduction by moving from specific findings to wider implications" (Swales 1990, p. 133). The main rhetorical function of the Discussion section is to make claims about the findings of the study, to summarize results, state conclusions and suggestions with reference to previous research. According to Hyland (1998), writers try to gain their academic credibility in this section of the RA by "going beyond their data to offer the more general interpretations" (p. 154). However, generalizing the findings of the study

will reduce its accuracy. The main reason for the heavy use of hedges in the Discussion section of the RAs is that generalizing the findings will maximize the risk of making mistakes. The writers try to use hedges to protect themselves against the rejection of their ideas by their peers.

The tentative nature of academic writing does not allow authors to state results too conclusively and make definite interpretations for them. A categorical assertion of the findings may imply that writers have the final word in that field. Hedges help writers to show their uncertainty regarding the interpretation of the findings and leave some room for further interpretations. For example, in the case of psychology this means that the interrelationship and impact of a social experience on subject's behavior is applicable to *most* of the cases not *all* of them. Similarly, in medicine, hedging can be used when writers do not intend to invest all their confidence in the results of their experiment (e.g., a drug). Sentence (37) taken from the English medicine RAs shows this point:

(37) Azithromycin has two other potential advantages: 1) it has a once daily dosing schedule, and 2) it is available in a 5-day-dose pack that *may* have increased compliance (Med 3, p. 2538)

As sentence (37) shows, the writer uses epistemic modal auxiliary to talk about the drug trial. In chemistry, likewise, the writers' motive for using hedging is to show that the resultant material is produced under limited conditions with specific mechanisms and these results may not be obtained in another situation.

The heavy use of hedging in this section compared to other rhetorical sections of RAs is quite predictable since making claims and generalizing the findings are the primary functions of this section and they require the writers to apply some tactical

means to protect themselves against the lack of accuracy, which is the result of generalization.

In order to account for the different distribution of the hedging functions in the Introduction and Discussion sections, one can argue that the higher incidence of writer-oriented hedges in the Discussion section of the RAs is due to the different level of claims made in these sections. The use of higher level claims in the Discussion section (e. g., generalizing the findings) can account for the higher occurrence of writer-oriented hedges in this section. As it was mentioned earlier, Hyland has associated the use of writer-oriented hedges with higher level claims in English. Writers favor using writer-oriented hedges once they make a "higher level" claim to guard themselves against any probable falsification of their assertion.

5.3 Hedging in the Disciplines

The results of this study also show some interdisciplinary differences in terms of frequency and forms of hedges. As the results of the current study indicate, the three English disciplines show some noticeable differences in the use of hedges. The English RAs in psychology contain the highest amount of hedges, whereas the relative overall number of hedges in medicine and chemistry RAs was about 57 % less than psychology. The English chemistry and medical RAs did not show a considerable difference in the overall distribution of hedges. These findings for the English RAs are consistent with Varttala's (2001) study in which RAs in medicine and technology were less hedged than economics. This comparison will hold true if we take the nature of the fields into account.

The differences between disciplines in using hedges have been approached differently by researchers. Some scholars like Markkanen and Schroder (1997) suggest

that the differences in the use of hedges between texts in different fields are not as significant as some scholars have assumed. However, Varttala (2001) has emphasized that the results of his study showed certain noticeable disciplinary differences in the use of hedges in RAs.

The object of the study has been reported to be one of the factors affecting the amount of hedging (Mauranen, 1997). Markkanen and Schroder (1997) have considered the different bases of argumentation in various fields as the major reason for variation in the use of hedges. According to this view, some fields like linguistics and philosophy would favor more hedging than other fields like natural sciences and technology. Spillner, as cited by Markkanen and Schroder (1997), stated that argumentation in natural science and technology is based on experimental data and concrete evidence, whereas this end is accomplished in other fields (e.g., social sciences) through the styles of writing. Markkanen and Schroder (1997) have stated that the use of hedges and other linguistic devices are significant in the convincingness of an argument in the texts belonging to "soft" fields (e.g., philosophy and linguistics).

In general, the differences in the overall incidence of hedges in different disciplines can be explained by considering the object and general nature of disciplines as well as the kind of materials and methods used in the study. The fields of chemistry and medicine, for example, can be categorized under "hard" sciences which by nature are different from psychology as a "soft" science. The "soft" science is characterized as having a theoretical foundation with tentative nature, whereas in "hard" sciences, as Varttala states, the methods and objects of the study are "more closely related to the traditional rigorous empiricism of the natural sciences" (p. 250). So the higher incidence

of hedges in English psychology RAs in this study can be attributed to the tentative nature of the field.

Considering the categories of hedging forms occurring in the three fields, one can notice that the incidence of adverbs as hedges in the English medicine and chemistry RAs is considerably higher than in psychology RAs. The higher occurrence of this category in these two disciplines can be justified by considering the fact that these fields are mainly concerned with experiments in which calculation and measurement is an integral part of the research. So the high occurrence of quantifying devices (e.g., adverbs) for indicating (im)precision or approximation in these two fields can be accounted for. Varttala has also reported a high occurrence of quantification hedges in English medicine and technology RAs. The Farsi RAs, however, do not show such a pattern. It seems that the category noun is mainly doing the same function as adverbs do in English.

Another source of difference can be traced to the nature of the fields. Psychology, for example, is mainly concerned with the human mind and behavior, and the usual way in which a particular person or group thinks and reacts. The researchers in this field do not have easy access to the mental processes of their subjects, which makes the analysis and explanation of the phenomenon difficult. Hence, psychological research is mainly made under conditions which may not be controlled by the researcher. In research concerned with medicine and chemistry, the setting of the experiments is more controlled and the material and procedures can be closely measured. The researchers in these fields, as pointed out by Varttala (2001), can explain the procedures of the experiment and also make conclusions with more confidence. This can partly account for the lower occurrence of hedges in these two fields as compared to psychology.

In this study, the Farsi RAs do not show a similar distribution of hedges as English RAs. The Farsi medical RAs have the highest incidence of hedges, whereas Farsi chemistry and psychology RAs are hedged about 40% less than medicine RAs. There may be different explanations for such a discrepancy. The absence of epistemic modal auxiliaries in Farsi can be one of the reasons for such difference. This can be shown by subtracting the frequency of modal auxiliaries from the total frequency of hedges for English RAs. This will result into a similar pattern for the distribution of hedges in the two languages across three disciplines.

One can also assume that there may be some disciplinary differences in terms of the content of rhetorical sections of the RAs in English and Farsi. This means that some sections like Results or Methods of a discipline in Farsi may contain some materials which are not the convention of other disciplines. For example, how much discussion should be provided in the Results section or how much numerical data should appear in the Discussion or Results sections can vary from one discipline to another and also from one language to another. The different emphasis given to various sections of RAs in English and Farsi can partially support this idea. The overall number of words in the Introduction and Discussion sections of English chemistry RAs is 2,672 and 8,651 words respectively, whereas they come to 2,103 and 1,775 words for Farsi chemistry RAs. So this can affect the frequency and kind of hedges used in different rhetorical sections of the disciplines. The small size of the data sample may have resulted in not providing an authentic distribution of the hedge across disciplines.

5.4 Pedagogical Implications

Teaching and learning to write English has become a significant undertaking in the academic world. The major reason for such an orientation can be attributed to the very competitive nature of academic life for publishing and circulating the latest achievements and results of the studies in English journals. Due to the large number of people who use English for their academic purposes, the empirical findings of this study may be useful for teachers and Farsi-speaking students learning English. The findings of this study also have implications for the material developers.

Large body of research has shown that ESL learners have difficulty in interpreting and using hedges appropriately (Allison, 1995; Blum-Kulka, 1982; Hyland & Milton, 1997). The difficulty of hedging and modality is partly due to its complex nature. The lack of a clear-cut division for the categories involved in expressing modal meaning, the wide range of linguistic and non-linguistic devices available for expressing degrees of certainty, and the existence of multiple meanings for linguistic forms are among the main reasons which are mentioned by Holmes (1982).

The variations in the use of hedges across languages and disciplines can also be a source of problems for ESL learners. This study showed that the use of hedging can vary considerably across languages and disciplines. Students should be aware regarding these variations and the different forms and functions of this linguistic device. Learners should also be aware of the relative frequency of different devices in various contexts so that they can accurately gauge the stylistic effect of using one form rather than another (Holmes, 1988). Language teachers should sensitize the students regarding the appropriate use of hedging in academic texts. Students' awareness regarding modality

and hedging devices should be increased. They should be aware of the significant role of this linguistic device and the fact that there are differences in rhetorical styles between English and their native language.

Teachers should make students aware regarding the different degrees of emphasis which writers may use in their claims. The ability to draw a distinction between observed facts and interpretations should be emphasized by the teachers when teaching writing skills. Teachers of writing should teach students how expert writers use hedging and modify their assertions appropriately.

Adams Smith (1984) has discussed this topic under aspects of author's comments. She recommended that students should be taught the wide range of tone from "objective recounting to persuasion, prediction, or recommendation" (p. 36).

The role and influence of L1 on L2 writing has been a major topic for researchers within the past few years (Cumming, 1994; Raimes, 1994). The studies in this area show that students tend to transfer the conventions of the L1 to the L2 context. The results of this study point to the need for designing some authentic materials for ESP, incorporating practice in using epistemic devices and emphasizing the variations which may exist between languages, disciplines and the rhetorical sections of RAs. This material should also put some emphasis on recognizing epistemic from non-epistemic meaning of lexical devices for English L2 learners. The material should also show that there are some lexicons which may function as a hedge just in one language and their equivalents may not have the same function in the other language. The material designers can use the findings of this study to develop materials which reflect the natural frequency and function of hedges in their work.

The pedagogical implications of this study also suggest that special attention should be paid to the influence of the disciplinary area on the distribution and nature of hedging. Students should be aware of the fact that there are some interdisciplinary differences in the use of hedging devices. Moreover, they should be aware regarding the different functions of the RA rhetorical sections and the frequency of hedges in these sections.

Different pedagogical exercises have been suggested to increase students' awareness of hedging. Salager-Meyer (1994) has suggested sensitization and translation exercises as one of the techniques to be used in ESP settings. This task may be effective especially for the students who share the same L1. For this exercise, students are required to underline all the hedges in the English text and provide an equivalent for them in their L1. Another suggestion made by Salager-Meyer is a rewriting exercise where students are asked to "rewrite" a popularization article according to the stylistic guidelines suggested to be appropriate for research articles. This demands a good command of pragmatic aspects of language and the necessary knowledge for producing and understanding appropriate discourse for different genres. In choosing the texts, simplicity and naturalness of materials can be taken into account. Reading and discussing texts and reading materials about hedging and epistemic modality in class may also be effective for improving students' knowledge regarding the appropriate use of hedging. This can sensitize students to the fact that hedging can be used differently across cultures, disciplines and also rhetorical sections of the research articles.

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Appendix A

List of English Research Articles (RAs) Used as the Data of the Study

Med 1- Bedoya, A.; Garay, J.; Sanzon, F.; Bravo, L. E.; Bravo, J.C.; Correa, H.; Craver, R.; Fontham, E.; Du, J. X. & Correa, P. (2003). Histopathology of gastritis in helicobacter pylori-infected children from populations at high and low gastric cancer risk. *Human Pathology, 34*, 206-213.

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List of Farsi Research Articles (RAs) Used as the Data of the Study

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Psych 2 – Shahni Yeilagh, M. & Akaberian, S. (2001). The effects of counseling on the reduction of depression and hopelessness in the young people suffering leukemia in Shafa Hospital. *Journal of Education and Psychology from Ahvaz Shahid Chamran University, 8*, 115-134.

روانشنا سی 3 - زاهدی فر,شهین ؛ نجا ریان , بهمن ؛ شکر شکن , حسین . 1379. ساخت و اعتبار یابی مقیاسی – برای سنجش پر خا شگری. مجله علوم تربیتی و روانشنا سی دانشگاه شهید چمران اهواز. سال 7 دوره سوم- صفحات 73-102.

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Appendix B

Items Expressing Doubt and Uncertainty in English (this list is illustrative not exhaustive) (Source: Hyland, 2000)

about	likely	should
admittedly	mainly	shouldn't
almost	may	somewhat
(not) always	maybe	sometimes
apparently	might	speculate
appear	more or less	suggest
appear to be	most	superficially
approximately	mostly	suppose
argue	not necessarily	surmise
around	normally	suspect
assume	occasionally	technically
assumption	often	tend
basically	partly	tendency
believed	partially	in theory
a certain X	perceive	theoretically
certain extent/ amount/ level	perhaps	typically
I/we claim	plausible	uncertain
conceivabl(y)	possibility	unclear
conjecture	possible (ly)	little/ not understood
consistent with	postulate	unlikely
contention	predict	unsure
could/ couldn't	prediction	usually
deduce	predominantly	virtually
discern	presumably	would/ wouldn't
doubt	presume	
essentially	probable (ly)	
estimate	probability	
evidently	provided that	
formally	propose	
frequently	open to question	
(in) general	questionable	
generally	quite	
guess	rare (ly)	
hypothetically	rather	
ideally	relatively	
(we) imagine	seen (as)	
implication	seem	
imply	seems	
indicate	seemingly	
infer	seldom	
largely	(general) sense	

Appendix C

Items Expressing Doubt and Uncertainty in Farsi (this list is illustrative not exhaustive)

probably/possibly/possibility	احتما لا/ بطور احتما لی / احتمال
to be probable	احتمال داشتن
basically	اساسا/ بطور اساسی
often	اغلب
most/mostly	اکثرا / اکثر
less / little	اند کی
it may be understood in this way	اینگو نه برداشت میشود
some	بر خی
some	بعضی
seem	بنظر رسید ن
it is better	بهتر است
assume	تصور شدن/ کردن
it may be thought that	تصور بر این است
approximately	تقریبا/ بطور تقریبی
may	توانستن
some	چندا ن
it implies that	حاکی بودن
about	حد ودا / تا حدودی
essentially	در واقع / واقعا
perhaps	شاید
believe	عقید ه داشتن
it is believed that	عقیده بر این است
hypothesize	فرض کردن
almost	قریب
in general/ generally	کلا / بطور کلی
report	گزارش کردن / شدن
usually	معمولا
may	ممکن بودن
relative/relatively	نسبتا / بطور نسبی

Appendix D

Examples of Judgmental and Evidential Main Verbs
(Source: Hyland, 1998)

Judgmental Verbs		**Evidential Verbs**	
Speculative	indicate	Quotative	report
	suggest		note
	propose		
	predict		
	assume		
	speculate	Sensory	appear
	suspect		seem
	believe		
	imply		
Deductive	estimate	Narrators	attempt
	calculate		seek