HEDGING AND BOOSTING IN ENGLISH AND INDONESIAN

RESEARCH ARTICLES

A Dissertation in
Applied Linguistics

by
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Abstract

The present cross-cultural and cross-disciplinary study was aimed at exploring the similarities and differences between English and Indonesian research articles from the disciplines of applied linguistics and chemistry in terms of frequency of usage of hedges (e.g. *perhaps, may*) and boosters (e.g. *clearly, very*). Theoretically, the study was designed to examine whether sociocultural context in which the articles were produced and discipline solely affect the rate of use of hedges and boosters in research articles. To this end, a corpus of 104 research articles (i.e. articles reporting on empirical research) from the two languages and disciplines were analyzed quantitatively with the help of corpus linguistic method. The findings of the study revealed that overall English research articles were more tentative than Indonesian articles, indicated by the more frequent use of hedges found in the former set of articles and the more frequent use of boosters found in the latter set of articles. The within-language comparison conducted showed that scholars from the two disciplines did not use hedges and boosters at comparable rates. This suggested that sociocultural context in which the research articles were produced did not largely influence the frequency of use of hedges and boosters. Likewise, the within-discipline comparison also showed that scholars writing in the two languages did not use hedges and boosters comparably frequently, which suggested that discipline also did not largely affect the frequency of use of the two rhetorical features. It is proposed that frequency of use of hedges and boosters in research articles might be influenced by the cultural models adopted by the individual scholars, and that hedges and boosters had differing situated meanings for different groups of scholars, and that the two rhetorical features were used by the scholars to construct a particular identity.
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Chapter 1 Introduction

1.1 Hedges and Boosters in Research Articles

Traditionally viewed as an impersonal, faceless representation of absolute truth (Gilbert & Mulkay, 1984), research article writing has now come to be seen as the writer’s act of making rhetorical appeal to the reader in an attempt to achieve persuasion which, in turn, makes his or her research most likely gain recognition within their disciplinary community (Hyland, 2000). Such rhetorical appeal for agreement is typically made by research article writers when they promote their own viewpoint, a unique viewpoint which has not become part of the shared disciplinary assumptions (Hyland, 1997). The writers’ seeking endorsement of their unique contribution can be considered as an indication that academic knowledge is socially constructed and is constituted by the disciplinary discourse (Berkenkotter & Huckin, 1995; Bruffee, 1986; Hyland, 2001; Myers, 1985a, 1985b).

Granted, the extent to which the achievement of readers’ endorsement is successful largely depends on the quality of the propositional content presented. However, presentation of ideas in writing requires more than quality proposition. A case study conducted by Flowerdew (2000) showed that rhetorical dimension of a research article was not less important than the actual content. That is to say, for readers to find a writer’s claim convincing such claim should not only accord well with what was believed to be true, but also be presented in ways socially considered appropriate. As pointed out by Hyland (2011a), academic persuasion involved not only convincing ideas, but also interpersonal negotiations made possible through the employment of disciplinary-
approved discursive practices. In quite the same vein, Kaplan (2005) submitted that successful conveyance of message requires, among other things, knowledge of available genres and their linguistic resources. The writer’s effective and/or strategic deployment of linguistic resources has been found to play a significant role in such knowledge ratification (e.g. Crismore & Farnsworth, 1989; Hoey, 2000). Hedges (i.e. expressions of tentativeness and probability, such as may and perhaps) and boosters (i.e. expressions of certainty, such as absolutely and certainly), in particular, are two types of linguistic resources which have been proved rhetorically powerful in persuading the readers and in influencing their attitudes towards the subject matter covered in the text (Crismore & Vande Kopple, 1997; Dafouz-Milne, 2008; Durik, Britt, Reynolds, & Storey, 2007).

Hedges are critical in academic writing (Hyland, 1998b). Skelton (1997, p. 44) convincingly argued that contrary to popular belief that “to lack certainty shows weakness, indecision, muddle or vagueness, not to be doubtful is often unwise, and empowering people to express doubt where there is no certainty is … an important pedagogic task.” There are at least two reasons why linguistic devices such as perhaps, may, and it is possible can be considered as crucial in “the knowledge-manufacturing industry” (Swales, 1987, p. 42). First, as the well-known scientist Albert Einstein stated, physical reality can only be perceived indirectly “by speculative means” (cited in Hyland, 1998b, p. 1). It follows that instead of saying something is, researchers are advised to say perhaps something is, given the multiplicity of interpretations which can be derived from observing the same physical reality. To put it differently, scientific statements cannot always be presented with full precision (Grabe & Kaplan, 1997, p. 152). This is especially true when a researcher wishes to promote a “high level claim” (Myers, 1985b),
a profound claim which is at variance with the current, well-entrenched scientific consensus within his or her scientific community (Dahl, 2009). Second, as has been mentioned above, hedges can have a positive affective impact on readers. In an experimental study, Crismore & Vande Kopple (1997) found that students who were exposed to a text containing hedges developed positive attitudes towards the text much more than those in the control group exposed to the same text without hedges. It would not be unreasonable to say that the greater positive attitudes generated by hedges will lead to greater chances that the claim presented would be accepted as true.

However, excessive use of hedges in a text might also have adverse impact on the writer’s credibility. Moreover, using hedges to express a low level claim (i.e. a trivial claim which almost does not contribute anything to the well-established structure of knowledge) will certainly backfire, since the writer will be considered as having insufficient scientific skills, and hence is not considered a member of the scientific community he or she is addressing. Creating a persona as an established member of the target community is crucial to the accomplishment of persuasion (Myers, 1985a). In sum, self-effacing is clearly insufficient to persuade readers (Myers, 1985b). For this reason alone, a writer also needs to present his or her claim with some degree of certainty. It is here that boosters play a significant role. Dahl (2008) reported on a study showing that scholars in the fields of linguistics and economics presented their new claims in the Introduction section of their RA with high degree of assertiveness as a rhetorical strategy to win the publishing competition. In short, hedges and boosters ‘represent a major contribution to the social negotiation of knowledge and writers’ efforts to persuade
readers of the correctness of their claims, helping them to gain community acceptance for their work” (Hyland, 2000, p. 89).

This clearly implies that it is necessary for academic writers to strike a delicate balance of scientific caution and assertiveness in presenting ideas in their research article (Hyland, 2001). Vázquez & Giner (2008, p. 174) were no doubt right when they stated that: “A major characteristic of academic discourse is the presence of elements whose purpose is to modulate assertions or emphasise statements.” In fact, a study conducted by Dafouz-Milne (2008) revealed that readers found more persuasive those texts populated with a right balance of hedges and boosters than the ones which were skewed in terms of the frequency of either of these devices.

The rhetorical power inherent in these two types of linguistic resources (hedges and boosters) is, perhaps, what has kindled considerable interest among writing scholars. Studies designed to examine the use of hedges and boosters in research articles have largely examined English texts from different disciplinary fields (Abdi, 2002; Charles, 2006; Crismore & Farnsworth, 1989; Dahl, 2008, 2009; Gil-Salom & Soler-Monreal, 2009; Gillaerts & Van de Velde, 2010; Hyland, 1996, 1998a, 1998b, 1999, 2008b; Kuhi & Behnam, 2011; Peacock, 2006; Silver, 2003; Varttala, 1999; Vázquez & Giner, 2008, 2009). Other studies compare how such interpersonal features are used in English and in other languages, such as Persian (Zarei & Mansoori, 2011a), French and Norwegian (Marshman, 2008; Vold, 2006b), Spanish (Martín-Martín, 2008), Arabic (Sultan, 2011), German (Kreutz & Harres, 1997), Greek (Koutsantoni, 2005a, 2005b), and Bulgarian (Vassileva, 2001).
The studies of the deployment of hedges and boosters in English research articles have demonstrated the pervasiveness of both rhetorical devices not only in disciplines relying on verbal argumentation, viz. soft knowledge domain, such as sociology, but also in those fields which deal with the so-called objective, measurable data, viz. hard knowledge domain, such as physics (e.g. Hyland, 2005a, 2006, 2008a, 2008b). This clearly suggests that hedges and boosters, being elements of metadiscourse (Hyland, 2005a), play a significant role and constitute central pragmatic features in the process of engaging, influencing and persuading readers to assent to the writer’s claims (Rubio, 2011). However, conflicting findings have been reported in regard to whether writers in the fields which belong to the soft knowledge domain use the two rhetorical devices at greater frequency than their counterparts in the fields under the hard knowledge domain. Similarly, comparative, cross-linguistic studies have yielded inconsistent empirical findings regarding whether English research article writers were more cautious or tentative (i.e. use hedges at a more frequent rate) than their non-native colleagues writing in other languages. As Salager-Meyer (2011, p. 36) cogently put it in regard to hedging, “an abundant literature has demonstrated the importance of this socio-pragmatic phenomenon in Anglo-American scientific/academic writing using different approaches, but no real consensus has been reached.” More specifically, one of the unsettled issues regarding the use of hedges and boosters in research articles revolves around the degree of influence of the sociocultural context in which the articles are written (which is to some extent connected to the culture of the authors) and discipline with which the scholars are affiliated. Furthermore, the considerable number of studies which have examined the use of hedges and boosters in research articles in English and other
languages notwithstanding, it is quite surprising to note that, with the exception of Hu and Cao (2011) and Itakura (2013), how these devices are used in research articles written in Asian languages has been left unexplored. In particular, studies of hedges and boosters deployed in research articles written in Indonesian are non-existent. As a corollary, very little is so far known about the use of the two interpersonal devices in research articles written in these languages.

1.2 Indonesian Problem

The Indonesian Directorate General of Higher Education (DIRJEN DIKTI) now requires that all academics of both public and private higher educational institutions in Indonesia publish their research in international peer-reviewed journals, preferably those journals with a high impact factor. The major reason behind such requirement is concerned with the advancement of knowledge and technology in Indonesia through the improvement of the quality of the research conducted. Currently, the percentage of academics who have published in international journals, let alone journals with a high impact factor, is obviously extremely low. In fact, over the last two decades in the field of Applied Linguistics alone there has been no Indonesian scholar who published his or her own work in international journals such as *Applied Linguistics, International Journal of Applied Linguistics* and *Modern Language Journal*. This fact has triggered DIRJEN DIKTI to offer a financial incentive of up to US$ 2,500 per article for that academic whose research article gets accepted in international peer-reviewed journals (Utomo, 2011). DIRJEN DIKTI seems to presume that the scanty participation of the Indonesian scholars in the international scholarly arena is engendered by their low motivation, and
such low motivation needs to be sparked using money. This presumption is apparent from the mission statement of the program, that is, to encourage and increase the interests of the Indonesian academics to publish their research articles in top-ranked international journals.

It might be no exaggeration to state that part of the problems encountered by the Indonesian academics who wish to publish their research in international journals concerns the rhetoric of publication, the problem which seems to be overlooked by DIRJEN DIKTI. It seems that DIRJEN DIKTI is not cognizant of the extra burden Indonesian academics have to carry when they have to publish in English (see Hanauer & Englander, 2011 for a study of how Mexican scientists perceived writing RAs in English). Obviously, the difficulties encountered by non-native speakers of English trying to publish in English medium international journals are considerable (Flowerdew, 2007). For these academics, such publication certainly requires not only a sufficient command of the syntax of the language, but also the rhetorical conventions typically deployed to achieve persuasion.

1.3 Rationale for the study

To summarize the points mentioned above, there are two problems which are inherent in the deployment of hedges and boosters in research articles written in English and other languages, one being theoretical and the other practical. Theoretically, it might be no exaggeration to state that our current understanding of the deployment of these two interpersonal devices in research articles remains in its infancy, despite the fact that such devices have been researched for over two decades. More specifically, the extent to
which sociocultural context and discipline alone exert considerable influence on the use
of the two rhetorical devices is far from clear. As will be demonstrated in Chapter 3, past
studies have produced conflicting findings in this regard.

To return to the fact that the scientific contribution of the Indonesian scholars to
the international scholarly community is almost non-existent, it seems to be misleading to
claim that it is their low interest in publishing their work in international journals which
has led to the absence of their work in those journals. After all, international publication
is given the highest credit point in the Indonesian academic ranking system. To state that
the almost absence of the Indonesian academics’ research in international journals is due
to the fact that their work is not worth publishing internationally obviously amounts to
unjustifiably undermining their scientific competence.

It seems that, therefore, we are left with the possibility that they lack the
knowledge of rhetorical devices which can be deployed to persuade or impress readers
(in this case, journal editors and reviewers) to assent to their claims or to demonstrate that
their work is significant. Hyland & Milton’s (1997) study shows that conveying
statements with appropriate degree of certainty in English academic writing is
problematic for Chinese speaking students. Similar problem may also be faced by
Indonesian academics in writing their English research articles. It is this possibility which
has motivated the present study into the comparison English and Indonesian research
articles in terms of usage of hedges and boosters. As will be mentioned below, the results
of the study are expected to inform Indonesian scholars of the rhetorical practices
adopted in English research articles. But what does exploration of Indonesian research
articles have to do with English rhetorical practices? It is assumed that by comparing the
English research articles with those written in their native language, especially in regard to the use of hedges and boosters, their awareness of the English rhetorical practices could be heightened.

1.4 Research Questions

This dissertation study was an attempt to address the problems identified in the previous section. That is to say, as has been mentioned above, the study endeavored to address the issue of the use of hedges and boosters in research articles from two disciplinary fields (chemistry and applied linguistics) written by native speakers of two languages, namely English and Indonesian. In other words, it is designed to answer the overall research question of whether sociocultural context or discipline solely influenced the rhetorical features of research articles (in particular, hedges and boosters). But why chemistry and applied linguistics? Disciplinary fields are divided into two major groups, namely hard sciences and soft sciences (Becher, 1989). While chemistry can be considered to be the representative of hard sciences, applied linguistics belongs to soft sciences. An attempt to explore the rhetorical characteristics of research articles should analyze articles from the two academic “tribes.” Moreover, the decision to choose chemistry in the present study comes out of the fact that such discipline has not attracted much attention from researchers. The central research question of the present study was as follows: “Do English native-speaking scholars use hedges and boosters differently in their research articles than Indonesian scholars?” More particularly, the study was set out to answer the following specific research questions:
1. Do English scholars (the two disciplinary fields combined) use hedges and boosters in their research articles at different frequency from Indonesian scholars?

2. Do English scholars in the field of applied linguistics use hedges and boosters at different frequency from Indonesian scholars in the same field?

3. Do English scholars in the field of chemistry use hedges and boosters at different frequency from Indonesian scholars in the same field?

4. What are the linguistic devices used by the two groups of scholars to explicitly hedge and boost their proposition? Is there any significant difference between English and Indonesian scholars in the frequency at which those devices are used?

Research question 1 above was specifically aimed at exploring the generalized picture of the use of the two devices in the two languages, while the two research questions which follow (research questions 2 and 3) are formulated to examine the use of the devices in the two disciplines in each language. Finally, research question 4 is concerned with the grammatical categories used by the two groups of scholars (fields combined) to express their degree of certainty regarding the validity of their claims.

It might sound absurd to include a research question which asks whether the linguistic forms deployed by the two groups of scholars are influenced by the sociocultural context in which they produce their research articles. It does sound unreasonable to argue that such sociocultural context is responsible for the differing linguistic realizations of hedges and boosters found in the two sets of research articles. The fact that an Indonesian scholar lives in Indonesia does not, theoretically speaking, induce the scholar to use, for example, an adverb to hedge or boost his or her proposition. No one would dispute that choice of linguistic forms to realize hedging or boosting in
research articles does not have anything to do with the sociocultural characteristics of the society in which the articles are written. But why include such research question, one might ask. The inclusion of such question in the present study is purely pedagogical, rather than theoretical, in purpose. The findings for such research question will inform Indonesian scholars regarding what linguistic forms to use when they attempt to publish in English-medium international journals. For example, the findings that English articles contain hedging adverbs significantly more frequently than Indonesian articles would suggest that Indonesian scholars might need to consider using such adverbs in their English articles for international publication more frequently when they need to hedge their claims.

The present study was primarily focused on the examination of overt expressions used by writers in the two disciplines from the two languages to increase and decrease the degree of certainty about the truth value of the proposition being presented. By overt, it is meant that the expressions unambiguously carry epistemic stance of the writers. The word *perhaps* in the sentence *Such differences are due to the restriction in range of retention scores from the more familiar passage, perhaps a result of several factors ...* unambiguously shows the degree of certainty on the part of the writer about the truth value of the proposition presented, or in other words, the writer is clearly unsure of whether several factors constitute the cause of the differences. The present study does not attempt to analyze grammatical constructions which might potentially be used by writers to mitigate or boost their proposition. Let us take agentless passive construction considered by some researchers (e.g. Salager-Meyer, 1994) as an instance of hedging. Although the following sentence is a hypothetical one, it is not difficult to find sentences
The data were analyzed using statistics x. If we agree that agentless passive construction represents hedging, we would force ourselves to interpret this sentence as a linguistic effort on the part of the writer to convey to the readers that he or she is not sure of the truth value of the proposition embedded in the sentence, an interpretation which is obviously unjustified, if not totally wrong. Moreover, the agentless passive construction, if it is indeed possible to identify the epistemic element contained, fails to provide clear indication whether the writer hedges his or her statement or whether it is just his or her stylistic preference. The ambiguity involved in the non-overt expressions (e.g. grammatical constructions) of hedges and boosters constitutes the major reason why such expressions are excluded from the analysis in the present study.

1.5 Operational Definition of Terms

It has been made clear in the previous section that the study was designed to address the issue of the use of hedges and boosters in research articles from the disciplines of chemistry and applied linguistics written in English and Indonesian by the native speakers of the respective languages. The operational definition of the terms research article, hedge and booster is as follows:

_Research article_: an article which reports on empirically-based research published in a scholarly journal.

_Hedge_: an explicit linguistic device (word or phrase) which demonstrates that the user withholds full commitment to the truth value of the proposition containing it.
**Booster**: an explicit linguistic device (word or phrase) which demonstrates that the user gives full commitment to the truth value of the proposition containing it.

**Sociocultural context**: social milieu or society in which the language is used as the primary means of communication. So the sociocultural context of Indonesian research articles is Indonesia, while that of the English articles is English-speaking (or English-predominant) countries, such as the U.S, Britain, Canada, Australia, and New Zealand.

**Discipline**: the field of study or branch of knowledge under which a particular research article can be included. Discipline in the present study specifically refers to disciplinary rhetorical conventions practiced in a branch of knowledge.

### 1.6 Study Purposes

The general purpose of the present study was to compare the use of hedges and boosters in research articles from the disciplines of chemistry and applied linguistics written in English and Indonesian by the native-speaking academics of the respective languages. Therefore, the study was generally aimed at shedding light on the similarities and differences between English research articles and Indonesian research articles. Theoretically, the study was aimed at exploring the degree of influence of factors such as sociocultural context and disciplinary conventions on rhetorical characteristics of research articles. To be more specific, it was designed to examine whether the frequencies at which hedges and boosters are deployed in the two groups of research articles were significantly different, and the extent to which the linguistic manifestations of these devices were different across the two research article groups (English and...
Indonesian, with the two fields combined). These will provide information about whether sociocultural context in which research articles are produced and discipline solely influence the use of hedges and boosters in research articles.

More specifically, the purposes of the study were twofold. The study was aimed at examining whether English scholars from the two disciplines used hedges and boosters at a different rate than Indonesian scholars from the corresponding disciplines. Along with this specific aim, the study was also intended to explore the general pattern regarding the linguistic devices deployed by the scholars from each discipline in each language in order to hedge and boost their propositions and/or claims in their research articles. That is to say, the study was geared towards investigating whether English and Indonesian scholars employ in their research articles similar lexical items and lexical types as the hedging and boosting devices. Indonesian scholars can be considered as using similar lexical items to hedge or boost their claims if the linguistic realizations they use are the direct translation of the corresponding English lexical items. The notion of linguistic types merely referred to grammatical categories, such as nouns, verbs, adjectives, etc.

1.7 Significance of the study

Cross-cultural studies into scholarly writing practices, such as the one reported on here, are important for a number of reasons. First, a study of Indonesian scholarly writing will enrich our understanding of the issue of academic writing. To reiterate, the present study is aimed at investigating to what extent English and Indonesian academics are similar or different in terms of their deployment of hedges and boosters in their research
articles (i.e. articles written in their respective native languages), an issue which has not attracted the researchers’ attention. Thus, on the theoretical level, the study makes a significant contribution to the literature of academic writing, especially research article writing. To put it differently, the findings of the present study contribute to avoiding what van Dijk (1994, p. 276) calls “scholarly and cultural chauvinism which at the very least diminishes the relevance and generality of our findings [i.e. findings of the studies conducted in dominant countries such as the U.S.].” Studies conducted on English academic writing are generally used to generate a general theory of academic writing, that is the theory which is presumed to hold true not only for English academic writing, but for academic writing in other languages as well. The availability of research findings on academic writing in languages other than English will serve as a test case for the existing theory (i.e. the theory generated from findings of research into English academic writing). Such findings will further our understanding of academic writing theory, accordingly.

Moreover, as has been indicated earlier, the results of the past comparative studies into the use of hedges and boosters in English and other languages (e.g. Spanish, Persian, Arabic) are inconclusive; it is not yet clear whether or not English research articles use these devices more frequently than those written in other languages; it is not yet clear whether sociocultural context in which research articles are written and discipline constitute the determinant factor of usage of hedges and boosters. As a corollary, the theoretical notion that genre, to be more exact academic writing genre, is situated (i.e. the claim that academic writing is largely influenced by the social cultural characteristics of the society within which it operates) is not yet settled, and obviously such claim is in
need of further empirical confirmation. The present study provides a portion of such empirical confirmation.

Second, the present study provides information about a distinct scholarly communication style which may prove beneficial to global scientific community. Insights into diverse academic communication styles will promote scientific cooperation and advancement of scholarship. As Duszak (1997, p. 3) put it: “Ignorance of, or misconceptions about, the communication styles of others [i.e. writers whose native language is not English] can hinder understanding among academics and ultimately obstruct cooperation and advancement of scholarship.” The urgency of the issue under study reported on in this dissertation lies in its practical relevance, more particularly in research article editing and reviewing adopted in international peer-reviewed journals. Needless to say, truly international journals really need scholarly contributions from academics coming from cultures other than English-dominant culture (see van Dijk, 1994). It is well known that English non-native academics carry with them their native writing conventions when they write in English. Arguably, English-speaking journal reviewers’ and editors’ familiarity with the academic writing conventions of cultures other than their own will make them less likely to react unfavorably to manuscripts written by non-native speakers. Such rhetorical familiarity on the part of the reviewers (i.e. English native speaker reviewers) certainly can prevent them from making such statement as “Obviously, this manuscript has not been written by a native speaker,” a statement which Flowerdew rightly labeled as “demoralising” (2000, p. 135). In short, the availability of research findings from cross-cultural studies, such as those reported on here, is hoped to encourage the reviewers and editors of international journals to avoid
making similar demoralizing comments which eventually can ruin global scientific cooperation.

However, it does not necessarily mean that non-native English-speaking academics can use the English language in their research articles however they wish to, since to do so may be at their expense. That is, disobeying the widely practiced discursive conventions on the part of the non-native scholars will result in the ultimate rejection of their contributions. Therefore, they also need to somehow conform to the rhetorical practices valorized and shared by academics working within the dominant academic society.

The third significance of the present study is concerned with the practical benefits accrued by the Indonesian scholars. It has been mentioned earlier that they have found it difficult to get their research published in international English-medium peer-reviewed journals, a state of affairs which has led DIRJEN DIKTI to offer a large sum of money to those who have successfully published their research in international journals. The availability of information about the rhetorical similarities and differences between English and Indonesian research articles enables the EAP practitioners in Indonesia to raise their students’ awareness of what makes acceptable rhetorical practices in the languages. Such awareness may promote their (i.e. students and scholars) negotiating capability in academic written discourse, which eventually can enhance the chances for successful publication.
1.8 Outline of the Chapters

The present chapter discusses the significance of the rhetorical features of hedges and boosters in research articles in the attainment of persuasion. It also presents information about the scarcity of publication in peer-reviewed international journals by Indonesian scholars, which is perceived as the outcome of their unfamiliarity of the rhetoric of international publication. These two issues (i.e. significance of hedges and boosters in research articles and scarcity of works in international journals by Indonesian scholars) have motivated the study reported on in this dissertation.

Chapter Two presents the theoretical framework adopted for the present study. In this chapter, the sociocultural theory of linguistics proposed by Gee (2008, 2011, 2012) is discussed. In particular, three aspects of the theory are reviewed in Chapter Two, namely situated meanings, cultural models and Discourses. Briefly, situated meanings are meanings which are not stable across contexts, whereas cultural models are belief systems underlying language use and Discourses refer to linguistic and non-linguistic resources used for the construction of speaker/identity.

Chapter Three reviews studies which have been conducted thus far into the use of hedges and boosters in research articles. It is worth mentioning at the outset that such studies are relatively scarce, despite the remarkable attention paid by researchers to rhetorical features of academic writing. Since the major purpose of the present study is to explore the unsettled issue of whether or not usage of hedges and boosters in research articles is a function of the language in which the article is written (and its accompanying culture) and discipline, both cross-cultural and cross-disciplinary studies are reviewed in Chapter Three. It is to be emphasized that the chapter only reviews the use of hedges and
boosters in research articles (including abstracts). Studies examining usage of hedges and boosters in newspaper editorials are not reviewed in Chapter Three.

Chapter four describes the design of the present study. In that chapter the size of the corpus and how it was built is presented in details. Moreover, the chapter also provides information about the methods deployed in the present study in identifying the linguistic devices under study. Also presented in Chapter four is how the data are analyzed.

Chapter five provides the details the findings of the study. After brief introduction, the findings for the use of hedges and boosters by the two groups of writers (fields combined) are presented. The following two sections in that chapter describe the use of the two features by applied linguists and chemistry, respective (English scholars vs. Indonesian scholars), which is followed by description of findings from comparison of the two disciplines in each of the languages. The final section in the chapter is specifically dedicated to description of findings from comparison between English and Indonesian scholars (fields combined) in terms of the linguistic realizations of hedges and boosters.

Chapter six presents six factors which might influence the use of hedges and boosters in research articles. Four of these factors have been proposed by other researchers to account for the differing rhetorical characteristics of research articles written in different languages. Therefore, one of the main aims of chapter six is to examine these four factors in light of the findings of the present study, that is, to explore the extent to which such factors can fully determine the frequency of use of hedges and boosters in research articles. The other two factors are proposed as complementary
factors which might influence rhetorical characteristics of research articles. These latter factors have not been taken into consideration in cross-cultural and cross-disciplinary research into rhetorical features of research articles.

Chapter seven is the final chapter of the dissertation which contains …. sections. After a brief introduction to the chapter, the summary of the findings and the resulting conclusions is presented. The subsequent section is concerned with the discussion of the limitations of the present study, which is subsequently followed by the pedagogical implications of the study. The chapter is concluded with a section on suggestions for future studies.
Chapter 2 Theoretical Framework

2.1 Introduction

As has been mentioned in the Introduction chapter (Chapter 1), the research study reported on in this dissertation was concerned with the use of hedges and boosters in research articles written in two languages, namely English and Indonesian. More specifically, it was aimed at examining the frequency of use of the two rhetorical features in such genre written in the two languages. The theoretical framework underpinning the study was derived from the theory proposed by James Paul Gee (1999, 2008, 2011, 2012). Central to Gee’s linguistic theory is the notions of situated meaning, cultural model and Discourse (with a capital D). Briefly, the situated meaning of a word is that meaning determined by the specific context in which the word is being used, and this context is associated with a specific cultural model embraced by the language user. Discourse is a combination of linguistic and non-linguistic resources deployed by a speaker/writer to construct a particular kind of person (i.e. the person’s identity). It is to be emphasized at the outset that in the present study only the linguistic component of discourse is relevant, since the study was not concerned with multimodal analysis of research articles.

Although Gee claimed that his theory constitutes a social and cultural approach to language based on the premise that the best way to understand language is to displace it “from the center of our attention and to foreground society, culture, and values” (2012, p. 1), the theoretical arguments for two of the three notions mentioned above (situated meaning and cultural model) resemble, to some extent, those advanced in the field of
cognitive linguistics. For example, cognitive linguists argue that meanings are not fixed, but rather context dependent, and that meaning making involves belief system adopted by the language user (Croft & Cruse, 2004).

Croft (2009) convincingly argued that cognitive linguistics construes “itself too narrowly as an approach to language” (Croft, 2009, p. 395, emphasis in original). He went on to say that the foundations of cognitive linguistics “are too solipsistic, that is, too much ‘inside the head’” and suggested that “cognitive linguistics must go ‘outside the head’ and incorporate a social-interactional perspective on the nature of language” (p. 395). The inclusion of discussion of identity construction through linguistic resources (as well as other semiotic systems) by Gee into his approach to language suggests that he responds to Croft’s call.

Gee’s theory of language, then, can be considered as socio-cognitive, rather than purely social and cultural, in nature. But why does a study on hedging and boosting in research articles need to be framed within a socio-cognitive approach? Arguably, hedging and boosting can be considered as socio-cognitive phenomena. As cognitive phenomena, the production and comprehension of hedges and boosters certainly involve some cognitive process taking place inside the head, that is, the process of ascribing meaning to such linguistic features. As a matter of fact, any linguistic production and comprehension engrosses some cognitive activity. However, when a writer mitigates or augments the truth value of a statement the cognitive activity is just one type of activity in which he or she is engaged. The mitigation and augmentation of the statement’s truth value on the part of the writer, it could be argued, is also geared toward building some sort of social relationship with the readership. For example, through the use of hedges to interpret
research findings the readership is portrayed by the writer as being equally intelligent capable of making alternative, equally valid interpretations of the same data. By the same token, the deployment of boosters by a writer is intended to promote solidarity with the readership. That is, boosting implies that there is some form of agreement between the writer and the readership as regards the truth value of the claim being presented. The cognitive and social nature of hedging and boosting necessitates the deployment of theoretical framework which covers both cognitive and social approaches to language, accordingly. The following three sections will discuss the three notions of Gee’s theory (situated meaning, cultural model and Discourse) which are subsequently followed by concluding remarks.

2.2 Situated Meaning

To many (ordinary) people, the meaning of a word is its definition as given in a dictionary. As Riemer (2010) put it, “when people think of a word’s meaning, they are inclined to think of something like its definition in a dictionary.” Additionally, the dictionary definition of a word is thought to be discrete and constant or fixed across communicative contexts. Thus, the meaning of the verb cut is whatever definition provided in a dictionary, and such meaning never changes regardless of the differential situations in which the verb is put to use. Another related popular belief about word’s meaning is that it exists in people’s heads. Words and their associated meanings, stored in long term memory from which sentences are constructed, are perceived to be contained in a compartment popularly referred to as mental lexicon (Riemer, 2010, p. 47). From this perspective, linguistic production (be it speaking or writing), so the argument goes, “is a
matter of mapping ideas onto those stored meaning representations in the mental lexicon that are associated with stable word forms,” and linguistic comprehension constitutes a quite similar cognitive process whereby the task of the listener or reader “is to map portions of the linguistic signal onto the stored neurosensory traces in the mental lexicon” (Garman, 1990, pp. 240-241, as cited in Riemer, 2010, p. 47).

The conceptions of linguistic meanings briefly described above have been challenged by Gee (1999, 2008, 2012). According to Gee, the meanings of most words are not static, but rather contingent upon the specific situations in which the words are being used. In other words, to use Riemer’s term, meanings are contextually modulated. As in Gee’s words,

the meanings of words are not stable and general. Rather, words have multiple and ever changing meanings created for and adapted to specific contexts of use. At the same time, the meanings of words are integrally linked to social and cultural groups in ways that transcend individual minds. (Gee, 1999, p. 40)

The “multiple and ever changing meanings created for and adapted to specific contexts of use” are what Gee referred to as situated meanings, that is, meanings that are “local, grounded in actual practices and experiences” (Gee, 1999, p. 40).

According to Gee, the general, dictionary definition of a particular word quite often is not in harmony with what people understand as the meaning of (or how they use) that word. He gives as an example the dictionary definition of the word bachelor: “unmarried male.” Gee (2008, p. 9) provided three situations wherein such definition (general meaning) does not apply well, namely the Pope, a young man who is in a permanent comma and an old man who has been living with his gay partner for quite a
long time. In all these situations, all of the men are unmarried, but nobody would say that they are bachelors. It is to be noted that Gee is not the only scholar who has rejected the idea that the meaning of a word is its dictionary definition. Scholars from other disciplines, such as cognitive science and artificial intelligence, also “have completely abandoned the idea that definitions even exist” (Riemer, 2010, p. 76).

The failure of the definition of the word bachelor to account for the three situations just mentioned, according to Gee, is due to the fact that meaning making is not about matching a word with its stored meaning in the mental lexicon. Rather, encoding and decoding meaning involve what he called “a little story” about the concept depicted by the word being used. In the case of the word bachelor, the following is the story that the speaker and listener come up with when they use it: “People usually get married to a member of the opposite sex by a certain age, men who stay unmarried, but available to members of the opposite sex, past a certain age are bachelors” (Gee, 2008, p. 9). The little story associated with the use of a particular word or phrase or utterance was referred to by Gee as “cultural model”. The concept of ‘cultural model’ will be discussed later in this chapter in some details.

Gee (2011) argued that in addition to situated meaning a word or utterance can also have its general meaning, meaning which emerges from the prototypical use of the word or utterance. This latter type of meaning is what he referred to as “utterance type meaning” while the situated meaning was called “utterance token meaning” (Gee, 2012, p. 94). For example, the general (or prototypical) meaning of the word cat is related to felines, whereas its specific (or situated) meanings can be found in the following sentences: The world’s big cats are all endangered, The cat was a sacred symbol to the
ancient Egyptians, The cat broke (Gee, 2011, p. 151). All the meanings that a word or utterance can have (prototypical and situated meanings) are its meaning potential. Gee further stated that not only lexical items, syntactic structures, such as subject, also have meaning potential. While the general meaning of the syntactic structure of sentence subject “has to do, broadly, with naming a ‘topic’ in the sense of ‘what is being talked about’” (Gee, 2011, p. 152), used in different situations subject can also convey a range of different specific meanings. Notice how the subject of each of the following sentences can be connected to different specific meanings: Mary is sad, John ran 45 miles a day, and George got cheated. While Mary is the experiencer of the feeling (sad), John is the actor who did the running and George is the victim of the cheating.

Grice made a distinction between utterance meaning and speaker meaning (Morris, 2007, Chapter 13). The fundamental difference between these two types of meaning lies in their stability. As Morris (2007, p. 251) put it: “The meaning of an expression is something stable, which resides in the expression itself, in some sense; whereas what I mean by an expression may depend just on the circumstances of a moment.” Clearly, Gee was concerned with only the speaker meaning. Used out of context, a word or utterance may invoke a certain image in the mind of different hearers, suggesting the stability of the meaning (i.e. expression meaning). However, when used by a speaker in a particular context, the same word may invoke an image different from the prototypical image. Take for example the word sick. When uttered out of context, as an independent word, it would lead a hearer to arrive at the meaning ‘physically ill.’ This is the prototypical meaning which resides in such word. However, a speaker can alter the meaning of the word by using it in a situation so as to induce an image different from the
prototypical image, for example in a sentence *He is sick!* commenting on a man who does something unusual (e.g. murdering his pet).

If meanings do not indeed exist in people’s heads from which they are retrieved, how do hearers make sense of words or phrases they hear? Gee provided the answer to this question as follows: “Listeners have to figure out – guess – what they [words and phrases] mean based on what else has been said and other aspects of the context … Meaning-making is not a ‘look up’ process. It is an active process” (2011, p. 153). Meaning-making as an active process means that situated meanings “are assembled out of diverse features, ‘on the spot,’ as we speak, listen, and act… Instantly, in context, we assemble the features that will constitute the pattern or situated meanings that a word will have in that context” (Gee, 1999, pp. 46-47, emphasis in the original). This is possible, as Gee pointed out, because in the process of interpreting any piece of language “we have general expectations about how our language is normally used” and these general expectations come from our previous experience in using the language (2011, p. 151). By general expectations, it means that we “know the possible range of the meanings of a word” (Gee, 2012, p. 96). For example, the features assembled on the spot for the meaning of the word *run* as used in the sentence *He runs two miles everyday* are quite different from the features assembled for the meaning of the same word when used in the sentence *His nose is running*. The active nature of meaning-making process is particularly apparent especially when listeners have to figure out meanings that fall beyond their general expectations, or in other words, when such meanings involve novel assemblies of features. In this very situation, the listeners must do extra cognitive work to actively seek what the speakers mean here and now. It is not difficult to see the different
degrees of cognitive work done by a hearer upon hearing the word *cat* as used in the following two different situations: in the context where the speaker is holding a pet cat saying *I love this cat* and in the context where the speaker is looking at the sky saying *the cat is moving faster than the star* (where *the cat* and *the star* are being used here to refer to cat- and star-shaped clouds, respectively).

Since meaning is typically derived from aspects of the context in which the language is being used, the speakers have to ensure that their listeners sufficiently share the knowledge and experience linked to the utterance if the communication is to go smoothly. As Gee (2012, pp. 96-97) put it: “If you have never heard about campaign finance reform and know nothing about U.S. politics, then you cannot situate a meaning for ‘democracy’ in an utterance like ‘The United States will not really be a democracy until we have real campaign finance reform.’”

Gee emphatically pointed out that the relation which holds between situated meanings and contexts is not unidimensional (i.e. contexts determine the features that we assemble) as we might expect, but rather two-way and dynamic. As he put it: “We do recognize or assemble situated meanings based on context, but we also construe the context to be a certain way and not another based on the situated meanings we assemble” (Gee, 1999, p. 47). He provided the following example to illustrate the dynamic relationship between situated meanings and context: “If I utter ‘sweet nothings,’ assembling the situated meanings they imply, in a certain situation, I am both taking and making the context as a romantic one” (Gee, 1999, p. 47).

How can the theory of situated meaning be applied to account for the use of rhetorical features of hedging and boosting in research articles? The prototypical meaning
of hedging is the use of linguistic expressions, such as *perhaps, suggest*, indicating that the writer withholds full commitment toward the truth value of the proposition being presented, and that of boosting is the use of expressions, such as *strongly, certainly*, indicating that the writer is committed fully toward the truth value of the presented proposition (Hyland, 2005a). However, this is not the only meaning which the two rhetorical features have as far as research article writing is concerned. Gee (2012, p. 87) stated that “one and the same speaking and acting can count as different things in different contexts.” That hedging and boosting can count as different things in different sociocultural contexts is indicated by the fact that the two features are used in different frequency rates in research articles written in different languages (i.e. in different sociocultural contexts), as shown by the literature review in the next chapter, strongly suggesting that hedging and boosting have different situated meanings, too. As has been mentioned above, the situated meaning of a word or utterance is connected to a little story. It is also true of the use of hedging and boosting in research articles. The little story which accompanies the situated meanings of hedging and boosting in a particular sociocultural context is different from the story which accompanies the use of the two features in another sociocultural context. That is why articles written in one sociocultural context are prone to be more tentative than those produced in another sociocultural context. Again, one of the strong empirical evidence for this claim comes from the fact that scholars from different sociocultural contexts treat the two features differently (at least in terms of frequency rates of use). For example, in one sociocultural context the excessive use of boosting might be considered normal, as it is conceived of as indicating authority on the part of the writer. However, such excessive use of boosting in another
sociocultural context might be regarded as a sign of arrogance on the part of the writer, perhaps because the writer is perceived as ignoring others’ viewpoints. Likewise, excessive use of hedging in a sociocultural context might be considered desirable for some reason while in another context it is best to be avoided as far as possible. These perceptions, as has been mentioned above, are the cultural models which influence the situated meanings of boosting and hedging. The following section is concerned with the concept of cultural models.

2.3 Cultural Model

In the preceding section it was mentioned that we situate meanings based on the cultural models (little stories) that we embrace. A cultural model is a typical picture which is constantly activated whenever we use language to communicate (Gee, 2012). As a typical picture, it constitutes an informal theory that we hold and is tied to the meanings (i.e. situated meanings) of words. By informal it means that the theory is an everyday, tacit, taken-for-granted one of which we are quite often unconscious. In examining the cultural models of education held by three groups of college students (American Indians, Asian American and European American) in the U.S., Fryberg and Markus (2007, p. 220) “assume that many of the assumptions and meanings that comprise models of education are tacit; for most students, they are probably not explicitly formulated as attitudes or verbal propositions, and are not readily available to conscious awareness.”

To reiterate, a cultural model is an informal theory. The notion of theory refers to “a set of generalizations about an area … in terms of which descriptions of phenomena in that area can be couched and explanations can be offered” (Gee, 2012, p. 13). Such
theory is different from the theory developed in science which is overtly reflected on and explicitly spelled out. Moreover, unlike scientists’ formal theories which are based on sound methodological observations, informal theories grounding our claims to know are built up through practical experience as we go about the business of living.

As has been mentioned earlier, people are reluctant to call the Pope a bachelor, despite the fact that he is unmarried and the definition offered in the dictionary is ‘unmarried man.’ Such reluctance, to reiterate, is the byproduct of the people’s beliefs or theories which just do not sit well with the situation. Another example would be related to the situated meanings of the word *work*. The cultural models associated with the word activated in the contexts such as *She works five days a week* are obviously different from those activated in the contexts such as *The computer does not work anymore*. Given the differential cultural models involved in the two contexts, no one would argue that the word *work* in these two sentences carry exactly the same meaning, although the general (i.e. utterance type) meaning of the word might remain constant.

The concept of ‘cultural model’ is fundamentally the same with the concept of ‘figured world’ put forth by Holland, Lachiotte Jr., Skinner, and Cain (1998). Figured world was defined as follows:

>a socially and culturally constructed realm of interpretation in which particular characters and actors are recognized, significance is assigned to certain acts, and particular outcomes are valued over others. Each is a simplified world populated by a set of agents (in the world of romance: attractive women, boyfriends, lovers, fiancés) who engage in a limited range of meaningful acts or changes of state
According to Holland et al., figured worlds are essential elements in the process of interpreting the meanings of words. As in their words: “When talking and acting, people assume that their words and behavior will be interpreted according to a context of meaning – as indexing or pointing to a culturally figured world” (Holland et al., 1998, p. 52). When people use the word bachelor, for example, they expect their listeners to enter a figured world in which the following prototypical events take place: men marry women by a certain age; a bachelor is an unmarried man past the marriage age, but is marriageable. It is clear that the Pope, who has taken a vow of celibacy, is not available for any woman, or in other words, he is not marriageable. As a consequence, the Pope is not a relevant actor or character in the figured world for the word bachelor. This is the reason why people are reluctant to call the Pope a bachelor, in spite of the fact that both a bachelor and the Pope are unmarried. The figured world for the word work in the context She works five days a week has the following, among other, events: people live a life; they need to work to earn a living. It is clear that the figured world associated with the word work as used in the context The computer does not work anymore does not have the same characters and activities, which explains why the word used in the two contexts is not interpreted in the same way.

Gee (2012, p. 99) stated that a cultural model represents “a picture of a simplified world that captures what is taken to be typical or normal.” What counts as normal or typical is far from universal. To put it differently, it varies from society to society. It is to
be noted that even within seemingly the same cultural group different cultural models may be present.

What counts as a typical story for people differs by their social and cultural groups. For example, some parents confronted by a demanding two-year-old who angrily refuses to go to bed take the child’s behavior as sign of growth towards greater autonomy because they accept a typical story like this: Children are born dependent on their parents and then grow towards individual autonomy or independence. On their way to autonomy, they act out, demanding independence, when they may not yet be ready for it, but this is still a sign of development and growth. Other parents confronted by the same behavior take the behavior as a sign of the child’s willfulness because they accept a typical story like this: Children are born selfish and need to be taught to think of others and collaborate with the family rather than demand their way. (Gee, 2012, p. 98)

The theories held by the parents are generalizations about child development which they use to explain a certain phenomenon (in this case, a two-year-old child who refuses to cooperate with others). Gee further stated that no cultural model can be said to be right or wrong. The two cultural models about child development mentioned in the above quote, for example, can be said to be right, at least in the eyes of their holders. Of course, when those cultural models are subjected to careful scientific observation one of them might turn out to be more accurate. The issue of whether cultural models are right or not is less significant for people who hold them; what is at issue is their function in helping people live their life (Gee, 2012, p. 98). People in power, for example, might be aware that the cultural models they embrace might not be quite right (e.g. those cultural models put
other people at a disadvantage), but they still enact such cultural models to go on about the business of their living, that is to achieve their purpose, in this case to maintain their power over other people.

The study conducted by Fryberg and Markus (2007) provided another empirical evidence which shows that the cultural models which reside inside people’s heads are not largely determined by their cultural membership. Fryberg and Markus (2007) examines the cultural models of education held by two groups of American Indian college students who grew up in two different sociocultural contexts: Indian reservation versus non-Indian reservation. The researchers found that although both groups of students expressed negative view of education, the students who grew up in an Indian reservation considered education as a tool for success significantly more likely than their peers who grew up outside of such reservation. However, the latter group of students was found to view education as acquisition of knowledge significantly more likely than the former.

Earlier in this section it was mentioned that when we situate meanings we activate the relevant cultural model. This might imply that cultural models exist only in our heads, ready to be activated whenever the situation demands. According to Gee (2012, p. 100), “that is not strictly true.” Gee (2012, p. 100) argued that cultural models “are partly in our heads and partly out in the world in books and other media and other people’s heads, people we can talk to.” He mentioned how the cultural models parents use to make sense of the behavior of the two-year-old who refuses to cooperate with others discussed above can also be found in many parenting books and conversations among professionals (professors, lawyers, etc.). Moreover, people do not always keep a cultural model for a particular word in their heads in its entirety. In other words, they might not know all the
aspects of a cultural model, all activities and actors involved in a figured world. However, it may be fair to say that the repertoire of aspects of a cultural model or figured world relevant for the situated meaning of a word stored in their heads is sufficient to enable them to grasp the situated meaning of the word in question, otherwise miscommunication will ensue.

If we agree that cultural models to some extent mediate our verbal behavior, the use of hedging and boosting in academic writing (e.g. research articles) can also be linked to the cultural models valorized by the writers. Considerable use of hedging in a research article can be considered as determined by the cultural model or figured world which is as follows: scientists disseminate knowledge through writing; research based on relatively limited empirical evidence cannot be thought of as giving way to a monolithic interpretation of the world. In quite the same vein, a sizeable amount of boosting devices found in a research article can be regarded as the reflection of the cultural model or figured world valued by the writer, a cultural model which might go like this: scientists communicate their research findings in writing, among other media; as scientists they are experts and, as a consequence, they need to be confident in whatever claim they make.

2.4 Discourses

The previous sections deal with how a word or expression can have different situated meanings depending on the context in which the word or expression is used, and how we situate meanings in accordance with the cultural models or figured worlds we embrace. This does not necessarily mean that the typical meaning making must have to do with the communication of utterance meanings per se. Rather, it also entails
communicating the identity of the speaker and a certain activity he or she currently is doing. As in the words of Gee:

To mean anything to someone else (or even to myself) I have to communicate who I am (in the sense of what socially situated identity I am taking on here and now) and what I am doing in terms of what socially situated activity I am carrying out” (italics in the original). (Gee, 2012, p. 152)

For example, in an interaction between a student and a professor what is at stake is not only transaction of utterance meanings, but also communication of identities of both parties (the identity of a student by the student and of professor by the professor) and relevant activity (e.g. discussion of a particular lecture topic) through appropriate language use and other relevant symbolic systems. In this particular case, the projection of identities and engagement in the relevant activity are done through avoidance of slangs and profane language and through avoidance of touching each other during the course of the interaction as in commonly the case of the interaction between close friends.

The communication of the identity of the speaker in the process of meaning making is achieved through what Gee referred to as a Discourse (with a capital ‘D’). It is to be noted that, as has been mentioned in passing in the previous paragraph, a Discourse consists of not only linguistic tools, but other symbolic resources. In other words, projection of a certain identity by a speaker involves not only the use of suitable linguistic expressions, but other non-linguistic, identity-bearing systems as well (e.g. clothing, tools) which are to be employed in coordination with language use. The following definition is the formal definition of a Discourse offered by Gee.
A Discourse is a socially accepted association among ways of using language and other symbolic expressions, of thinking, feeling, believing, valuing, and acting, as well as using various tools, technologies, or props that can be used to identify oneself as a member of a socially meaningful group or “social network”, to signal (that one is playing) a socially meaningful “role”, or to signal that one is filling a social niche in a distinctively recognizable fashion. (Gee, 2012, p. 158)

Successful construction of identity (i.e. the speaker’s intended identity is recognized as such by an interlocutor) is largely determined by the extent to which the use of language is synchronized and/or matched perfectly with the use of other non-linguistic sources. A person who wishes to be identified as a gang member by using an appropriate linguistic style (i.e. the style widely used by other members of the same gang), for example, might not get recognized as an insider of the gang if the linguistic style in question is not accompanied by appropriate use of non-linguistic sources, such as ways of wearing clothes, ways of thinking, etc. Similarly, a job applicant might not get the job if he or she does not display a belief system valorized by the employer (e.g. willing and able to work without any supervision) no matter how standard the applicant’s English language is. This is because, at least in the eyes of the employer, the applicant fails to communicate the desired identity through ways of believing, in spite of the fact that the kind of English used by the applicant during the interview is exactly that used by other employees. In other words, the applicant’s desire to project an identity as the right kind of person to handle the job is not recognized by the employer due to the lack of appropriate ways of thinking valued by the company. Thus, language alone is not enough for the communication of identity. Projecting identity through a Discourse is akin to engaging
“in a particular sort of ‘dance’ with words, deeds, values, feelings, other people, objects, tools, technologies, places, and times so as to get recognized as distinctive sort of who doing a distinctive sort of what” (Gee, 2012, p. 152).

Bucholtz (2011) showed how white (European American) students at a high school (Bay City High) in California constructed their identity as preppies not only through indexical use of innovative linguistic structure, but also through clothing and geographic space. In terms of clothing, preppy male students were clearly distinguishable from their non-preppy counterparts: “Preppy boys wore their shirts and pants loose but not as baggy as in hip hop fashion, and many wore baseball caps and jackets with sports insignia” and they also typically wore white shoes (Bucholtz, 2011, pp. 91-92). It was also true of preppy girls who were clearly distinctive to be recognized as preppies by wearing fashion style which was not popular among non-preppy female students; they “often wore close-fitting, revealing clothing, such as tight baby-doll T-shirts that provided glimpses of their torsos, short shorts and miniskirts, low-slung bellbottom jeans, and low-cut tank tops and camisoles that left their satin bra straps in view” (Bucholtz, 2011, p. 92). In addition to clothing, the preppy identity was also indexed through claiming certain geographic spaces on school campus, the spaces where only preppies congregated. Linguistically, preppy students made their identity clearly noticeable by using an innovative quotative marker (be all). Quotative marker is a form used “for marking upcoming speech as attributed rather than uttered in the current speaker’s own voice” (Bucholtz, 2011, p. 101), for example They were all, “No”. At Bay City High at the time when Bucholtz conducted her study, “be all was primarily used by preppy students, especially preppy girls,” while non-preppy students preferred to use other
quotative forms (*go*, *be like*, *say*). The combination of the three elements (linguistic style, fashion style and geographic space in which they hang out) mentioned above constitute what might be called a preppy Discourse.

The deployment of only one Discourse element (e.g. linguistic style) by a white student who wished to be identified as a preppy student might not get recognized as a preppy, since other indexical elements were not made use of in coordination with such linguistic element. Finally, we can mention that these preppy students held a distinctive value system in regard to what it was to be a high school student, a value system which made them highly noticeable as preppies: “Such students [preppies] were ambitious, high-achieving, and deeply involved in the school’s institutional structure via prestigious extra-curricular activities such as the student council, the school newspaper and the yearbook, and white-dominated sports like soccer and lacrosse” (Bucholtz, 2011, p. 90).

That identity work is accomplished through language along with other symbolic sources suggests that identity is a discursive phenomenon, an entity which does not precede semiotic practice but is brought into being by such semiotic practice (i.e. emergent) during the course of specific social interaction (e.g. Bucholtz & Hall, 2005; Bucholtz & Hall, 2010; Kubota, 1999, 2002; Pennycook, 2007). Kroskrity (2000, p. 111) defined the concept of identity as “the linguistic construction of membership in one or more social groups or categories.” From this standpoint, identity is the outcome, rather than the determinant of linguistic form, or in other words linguistic forms are the reflections of identity, as claimed by correlational studies within the Labovian variationist sociolinguistics (see Tagliamonte, 2012 for review). Since language use is constitutive, rather than reflective, of social identities, it follows that identities are unstable. As
Cameron (2001, p. 170) put it, rather than being “fixed, stable and unitary … identity is shifting and multiple, something people are continually constructing and reconstructing in their encounters with each other and the world.”

Gee’s Discourse theory is compatible with identity theory which sees identity as performance. From the performance perspective, “identity is an emergent construction, the situated outcome of a rhetorical and interpretive process in which interactants make situationally motivated selections from socially constituted repertoires of identificational and affiliational resources and craft these semiotic resources into identity claims for presentation to others” (Bauman, 2000, p. 1). The performatve aspect of identity suggests that “individuals consciously pursue personal goals in attempting to be seen as a certain kind of person” (Hyland, 2012, p. 7). Moreover, it foregrounds “the productive force of language in constituting identity rather than identity being a pregiven construct that is reflected in language use” (Pennycook, 2007, pp. 70-71). According to this perspective, gender, for example, is perceived to be discursively constituted, rather than to exist independently of language use. As in the words of Pennycook (2007, p. 71): “The question for language and gender studies … is not how men and women talk differently, as if males and females pre-existed their language use as given categories of identity, but rather … how we do gender with words.”

Zimmerman (1998) proposed three types of identity, namely discourse identity, situated identity and transportable identity. Gee’s notion of identity which is reflected through the deployment of a relevant Discourse is exactly the same as Zimmerman’s discourse identity. The notion of discourse identity is defined by Zimmerman (1998) as that identity emerging as discourse participants engage in an activity at a particular point
in an interaction. As the participants to an interaction engage in many different activities, such as asking questions and telling stories, it follows then that there may be multiple identities assumed by a discourse participant who simultaneously projects a relevant identities on to the interlocutors.

Discourse identities are integral to the moment-by-moment organization of the interaction. Participants assume discourse identities as they engage in the various sequentially organized activities: current speaker, listener, story teller, story recipient, questioner, answerer, repair initiator, and so on …. In initiating an action, one party assumes a particular identity and projects a reciprocal identity for co-participant(s). (Zimmerman, 1998, p. 90)

Discourse identity “is not something that one just ‘is’ … and it is not something that some institution creates and upholds” (Gee, 2001, p. 103). Rather, it is something that one achieves through certain discursive practice and through recognition of others acting as rational individuals involved in the discourse. For example, the source of, or the power that determines, an identity as an expert projected by a professor in his or her research article is not the institution with which he or she is affiliated, but the discursive practice that he or she adopts in his or her writing. Although the academic rank professor is typically associated with being expert in a particular disciplinary field, it is possible for the person holding such academic rank to make the identity as an expert invisible, for example through the use of linguistic devices that mark tentativeness.

It is to be borne in mind that professional identity construction through Discourse by an academic author is not stable across his or her lifespan. That is, the same author writing at different life times does not always assume the same identity. Such instability
in identity construction is influenced by a variety of factors, one of which is the current state of knowledge or expertise of the author (Gotti, 2010). The study carried out by Poppi (2009) to examine academic identity construction by an economist, P. A. Samuelson, in his five different editions of the same book entitled “Economics” written over a period of 53 years, showed that Samuelson’s academic identity evolved and changed during the time span. For example, his statement became more assertive over time; in one edition he wrote the following, *Economics […] can combine the attractive features of both the humanities and the sciences*, a statement which he revised in a later edition as follows, *Economics […] combines the attractive features of both the humanities and the sciences*. We see here the transformation of an author’s identity from a cautious academic to a confident one, presumably caused by, among other things, his accumulating expertise in the issue being presented. D’Angelo (cited in Gotti, 2010) found positive correlation between degree of expertise of authors and appraisal in linguistics book review: “as scholars become more expert, their confidence increases in evaluating other people’s work” (Gotti, 2010, p. 47).

Gee (2012, p. 153) further noted that each individual has multiple identities. This implies that, since an identity is projected through a relevant Discourse, each individual has a repertoire of Discourses. Different combinations of ways of using language, of thinking, of valuing, etc. (i.e. different Discourses) are evoked to enact different identities at different times. The same individual uses a particular Discourse to construct an identity as a scholar (e.g. as a biologist) at a particular time and at another time will use yet another Discourse to construct the identity as a son or daughter.
The foregoing discussion seemingly gives the impression that there exists a one-to-one relation between identity and Discourse. That is, a particular combination of elements of Discourse is always associated with a certain identity. To put it another way, using the same combination of linguistic and non-linguistic resources an individual comes to be recognized by different people in different situations as presenting the same self. That is not always the case, unfortunately. Using weapon as an analogy, Gee (2012, p. 153) argued that “the very same thing might be recognized as a weapon in one context and not in another.” To use academic writing as an example, a writer’s use of boosting device (e.g. The data clearly shows that …) might in one sociocultural context be associated with a particular Discourse which enacts a particular identity (as an expert, for example), but in another sociocultural context such boosting use might generate another sort of identity in the mind of the readers (as an over-confident scholar, for example). It is also true of the use of hedging marker (e.g. The findings may be the result of …). The Discourse elements accompanying such hedging use might be different across contexts, and hence the sort of identity projected through such hedging use might be different from one context to another. The fact that scholars within the same academic discipline operating in different sociocultural contexts use hedging and boosting at significantly different rates suggests such association between Discourse elements (and the resulting identity) and the use of the two markers. Stronger empirical evidence comes from translation studies which compared the use of hedging devices in the original texts with the use of such devices in the translations. These studies showed that when translating English texts the translators modified the hedging so as to conform to the sociocultural values of the society in which the translation was published (See next chapter on review
of literature). Such modification is triggered by the fact that hedging evokes different writer’s identities in different sociocultural contexts.

The final remark which needs to be mentioned in regard to the construction of identity through Discourse is that such identity work is social in nature. That is, successful construction of identity is not solely determined by the speaker/writer alone, but involves the interlocutor as well. Accordingly, it is not impossible to find a situation wherein, as we have mentioned earlier, the speaker’s/writer’s desired identity and the identity generated by the interlocutor for the speaker/writer are at odds. Ochs (1996) points out that the ascription of indexical meaning to a linguistic structure is not accomplished by the speaker alone, but rather constitutes a collaborative work between speaker and hearer or, in the case of written interaction, between writer and reader. Since meaning making “is not a static structure, but rather it reflects a dynamic process which develops and changes as the participants interact” (Gumperz, 1982, p. 131), what Ochs (1996) referred to as “indexical breakdown” may sometimes occur during the interaction. Such indexical breakdown occurs because the linguistic “contextualization cue,” defined by Gumperz as “any feature of linguistic form that contributes to the signaling of contextual presuppositions” (1982, p. 131), deployed by the speaker to index a particular meaning is not picked up as such by the hearer.

A number of indexical breakdowns can be found in chapter 6 of Gumperz’s (1982) book, one of which is briefly mentioned here. The interaction was between an American house painter and a British woman married to an American man living in California, and the interaction took place in the woman’s house. Upon seeing numerous paintings hung on the walls of the living room, the painter made the following remark:
“Who’s the artist?” with the stress being put on the first syllable of the word artist. To the painter’s surprise, the British woman replied with the following: “The painter’s not too well known. He’s a modern London painter named ____.” To ordinary American ears, such idiomatic expression by the painter is a common compliment between strangers, rather than a request for information, and hence the customary responses would include “It’s just a hobby” and “I’m just a fan.” According to Gumperz, one of the main factors which leads to the failure of the British woman to identify the indexical meaning of the painter’s utterance (the social act of complimenting carried by the utterance, to be more exact) is her failure to pick up the intended contextualization cue, in this case the stress on the first syllable of the word artist. Moreover, Gumperz also stated that such misunderstanding is engendered by the absence of “shared history and communicative experience” between the two participants (1982, p. 144).

Another example of indexical breakdown, this time involving extra-linguistic contextualization cue, where such cue is not intended by the speaker to create the meaning of his or her utterance but is picked up by the interlocutor, is provided by Blommaert (2005). On the way to a restaurant with his young female research associate from the hotel where they stayed for a conference, Blommaert asked the female research associate in Dutch, “Do you have a nice balcony, too?” (p. 42) He asked this question because his room had a nice balcony. At the moment when he asked this question, a woman wearing a sexy summer top exposing part of her breasts was passing in the opposite direction. In Dutch, the term for balcony, balkon, is also a male slang term used to refer to breasts. As told by Blommaert, this unintended contextualization cue was
picked up by the female research associate to create a mental image of an abusive man for him, a social identity he did not intend to project through his question.

2.5 Conclusion

Gee’s socio-cognitive approach to language sees language not as an entity independent of other entities (e.g. cognition, society, cultural values), but rather it is closely linked to its surroundings. Therefore, language is best interpreted in terms of how it is used by a particular group of people in a particular context at a particular time period. For Gee, language-in-society should be the heart of the field of linguistics.

Since language is inseparable from the sociocultural context in which it is used as the medium of communication, it follows that the meaning of a linguistic feature, as can be expected, is not universal. Meaning is very much determined by the particular context in which it is made. This is the idea of situated meanings proposed by Gee. In academic writing, hedging and boosting devices, although they have core meanings (or what Gee referred to as utterance-type meaning), might be interpreted differently when they are used in different sociocultural contexts having different ideological structures. The notion of ideological structures here should be interpreted as meaning the cultural values valorized by specific societies; they are the cultural models which underlie the use of words or expressions. The fact that hedging and boosting devices are used differently (in terms of rate of frequency) by scholars from different cultural contexts suggests that the two rhetorical features might be associated with different cultural models adopted by those different scholars. Finally, another concept which is at the center of Gee’s sociocultural approach to language is Discourse (with a capital D). While discourse (with
a small ‘d’) refers to language in use beyond the sentence level, Discourse was taken by Gee to mean ways of representing self through both language and non-language resources. Production and interpretation of academic discourse (both written and spoken) involves identity work accomplished through both language and other symbolic systems (Duff, 2010). Through hedging and boosting (and their associated ways of valuing and believing) academic writers construct their desired identity, which may or may not be recognized as such by the readers.

However, if the writer and the readers are within the same cultural context operating with relatively the same cultural values, chances are that the writer’s desired identity will be recognized quite easily by the readers. This is tantamount to saying that the same linguistic or rhetorical feature might lead to the construction of different identities in different sociocultural contexts. A writer who uses quite many hedging devices in his or her research article might be portrayed by the reader as a certain kind of person in one sociocultural context, but in a different sociocultural context the same writer might be recognized as yet another kind of person. This is because, to reiterate, different sociocultural contexts value different cultural practices which are in turn determined by their different Discourses (e.g. ways of thinking, of valuing).

One final comment is worth mentioning here. Although Gee argued that his theory is social and cultural approach to language, as has been pointed out in the introductory section in this chapter, the discussion of situated meaning and cultural model has been the subject of cognitive linguistics for quite some time. But this does not mean that Gee operated within the realm of cognitive linguistics, as suggested by the terms he used, terms which are not typically used in cognitive linguistics. In cognitive linguistics,
the concepts of frame, domain, and encyclopedic knowledge are typically employed in discussing the nature of meaning.
Chapter 3 Review of Studies

3.1 Introduction

It is now widely accepted that academic writing is not just an objective account of reality devoid of personal stamp of the writer. This is engendered by the realization among philosophers of science that “induction offers probabilities rather than proof, and by moving from observations of instances to general statements about unobserved cases, scientists introduce uncertainty” (Hyland, 2011b, p. 194). Moreover, the idea that academic knowledge presented in academic writing is the byproduct of the writer alone has been painted into a corner as out-of-date. The view which foregrounds the social nature of academic knowledge has gained momentum in recent years. Myers’s (1985a) *The social construction of two biologists’ proposals* is one of the earliest articles which provide empirical evidence which points to the social construction of academic knowledge. In this seminal article, Myers showed how the writing of research grant proposals necessitated building consensus among biologists involved (i.e. between the grant proposer and grant reviewers). In short, following (Livnat, 2012, p. 1), “scientific work is a social act that exists within a framework of agreed-upon social mechanisms.”

Hedges (e.g. *perhaps, might*) and boosters (e.g. *definitely, clearly*) are two interactional features used widely by scientific writers to indicate the presence of diverse viewpoints on an issue they address. As such, they are textual indicators of the social and collaborative nature of scientific claims. As two sides of the same coin, hedges and boosters emphasize the subjectivity of a position. While hedges are devices used to indicate that a position is merely a personal opinion of the writer rather than a fact, thus
indicating that there exist other alternative, equally valid, positions, boosters are devices used to fend off those existing viewpoints (Hyland, 2005a).

One might argue that boosters, due to the high degree of epistemic certainty they carry, suggest that the writer does not acknowledge alternative positions, or in other words there is only one possible position regarding the issue being raised, and as such they should not be considered as rhetorical and/or interactional features. However, when a writer uses such epistemic devices it is not that he or she believes that there is only one viewpoint possible, but rather that he or she prefers, for whatever rhetorical reasons, to close down such diversity. As Hyland put it, by deploying boosters a writer “recognizes potentially diverse positions but has chosen to narrow this diversity rather than enlarge it, confronting alternatives with a single, confident voice” (2005a, p. 53).

This chapter reviews studies into the use of hedges and boosters in research articles. It should be noted at the outset that compared to other aspects of research articles, such as rhetorical moves, use of first person pronouns, quite surprisingly the use of hedges and boosters in research articles has attracted comparatively little attention from researchers. Comparative studies examining the use of the two rhetorical features in research articles written in two or more different languages and disciplines are particularly sparse. This situation has resulted in the gap of knowledge of how such features are deployed in research articles. The following section briefly reviews past cross-linguistic studies into the use of hedges and boosters, followed by a review of studies into the use of the devices across disciplines. In the subsequent section, Discussion, it is argued that those studies do not produce consistent findings. Some reasons for such inconsistency are also laid out briefly in that section. Finally, in the
concluding section, I argue that more comparative studies are urgently needed to clarify the issue of the use of hedges and boosters in research articles if the goal is to gain fuller understanding of the phenomenon.

3.2 Cross-Linguistic Studies into Hedging and Boosting Use

Hu and Cao (2011) investigated the influence of language, culture and genre on the use of hedges and boosters in abstracts accompanying academic journal articles on second or foreign language teaching and learning. To this end, the researchers compared three sets of research article abstracts from applied linguistics: those written in English published in international journals in the UK or US (n = 195), those written in Chinese published in Chinese-medium journals in mainland China (n = 227) and those written in English by Chinese native speakers published in the same journals as the Chinese abstracts (n = 227). The abstracts were collected from four leading refereed journals from each of the two languages; the Chinese journals were published in 2007, whereas the English journals were published in 2007 and 2008. Hedges and boosters were operationally defined as those metadiscursive devices which “signal writers’ stance over entire propositions rather than modify individual lexis” (Hu & Cao, 2011, p. 2799). A list of hedges and boosters in English and Chinese abstracts was developed as a coding scheme on the basis of previous studies before the coding process was begun. The results revealed that the English authors used hedges significantly more frequently than the two groups of Chinese authors, with the latter two groups being not statistically different from each other. On the other hand, the Chinese applied linguists writing in Chinese used significantly more boosters than the other two groups publishing in English (those who
published in international journals and those who published in Chinese journals in mainland China), with no significant difference found between the latter two groups. On the basis of these findings, Hu and Cao (2011, p. 2804) contended that it is “the culturally-based rhetorical conventions and styles of persuasion that prevail in the larger sociocultural contexts” which influence the differential use of hedges and boosters.

Zarei and Mansoori (2011b) studied metadiscourse in research articles from the discipline of computer engineering written in English and Persian. Metadiscourse is “the cover term for the self-reflective expressions used to negotiate interactional meanings in a text, assisting the writer (or speaker) to express a viewpoint and engage with readers as members of a particular community” (Hyland, 2005a, p. 37), of which hedges and boosters are two elements. The corpus for the study consisted of 10 randomly chosen research articles (five from each of the languages). The journals from both languages from which the articles were drawn were well-known, peer-reviewed ones and were published between 2004 and 2006. Zarei and Mansoori found that English articles contained significantly more hedges than Persian ones. For boosters, on the other hand, Persian articles significantly outperformed English ones. There was also a striking difference in terms of proportion of hedges and boosters in the two sets of articles. In Persian articles, boosters were used twice more frequently than hedges, whereas in English articles hedges appeared five times more frequently than boosters, a finding which could be interpreted as English engineers (at least those whose research articles included in the corpus) were much more cautious in presenting their propositions compared to their Persian counterparts. Zarei and Mansoori argued that their findings point to the notion that “all language use is a social and communicative act in which
mutual cooperation and assistance are socio-culturally determined and provided between the producer and receiver of the language to exchange information” (2011b, p. 1041). To put it briefly, according to Zarei and Mansoori the use of hedges and boosters in the research articles in their corpus is influenced by the sociocultural context in which the articles are produced.

Mur-Dueñas (2011) compared the use of metadiscourse features in business management research articles written in Spanish and English. The analysis was carried out on 24 research articles (12 from each language) taken from four leading international journals and four Spanish journals. The English writers came from the same North American university and the Spanish writers also from the same Spanish university. Mur-Dueñas reported that “although not necessarily native speakers of one or the other language, the authors of the RAs [research articles] are acquainted with the respective American and Spanish academic conventions” (p. 3070). Unlike other studies, the features were not predetermined in advance in this study. Some articles were read carefully to derive the target features to be searched for electronically. No mention is made of the number of articles carefully read for this purpose. Given the topic of the present dissertation study, only the findings for hedges and boosters will be mentioned here. Mur-Dueñas found that English articles used significantly more hedges than Spanish ones, although “this is the category of metadiscourse most heavily used both in the English and in the Spanish sub-corpus” (2011, p. 3073). According to Mur-Dueñas, this finding indicates that Spanish scholars, compared to their English colleagues writing for international readership, are not cognizant of the provisional nature of their findings. This is in turn, Mur-Dueñas went on to say, triggered by the differential size and
homogeneity of the readership involved. As for the frequency of use of boosters, however, it was found that there was no statistically significant difference between the two sets of articles. That is, the two groups of scholars from business management were comparable in their rate of use of boosters in their articles. Surprisingly, this non-significant difference in the use of boosters was taken by Mur-Dueñas as suggesting that “Spanish scholars make their claims in a slightly more assertive tone” (p. 3073). Obviously, this interpretation was made on the basis, not of the results of the inferential statistical analysis she ran, but of the results of the descriptive statistical analysis which indeed showed that Spanish scholars used slightly more boosters than English scholars.

Abdollahzadeh (2011) analyzed the use of three interpersonal metadiscourse markers (hedges, boosters and attitude markers) in two sets of conclusions extracted from applied linguistics research articles written in two languages (English and Persian) published over the years 2000-2004. The articles from which the conclusions were extracted “were selected from a pool of representative local and international applied linguistics journals” (2011, p. 291). The local journals were six journals which were published in Iran, whereas the English journals were six international journals most of which were published in the US. The size of the entire corpus of 60 conclusions (30 from each language) for the study was 29,600 words. Following Vande Kople’s (1985) taxonomy, the analysis was focused only on those interpersonal markers which comment on the entire proposition rather than part of it. So the adjective important in “From among the three patterns proposed by researchers as important, pattern three demonstrates a significant contribution” was excluded from the analysis, since it reflects the writer’s attitude toward only part of the main propositional content (cf. “Most
important of all, pattern three was found to have a significant contribution"). The two sets of conclusions were not found to be significantly different in terms of rate of use of hedges. Unfortunately, Abdollahzadeh did not offer any explanation to this finding, although he provided an account of the heavy use of hedges in the entire corpus (both sets combined). On the other hand, the English conclusions contained significantly more boosters than the Persian conclusions. English writers in Abdollahzadeh’s study used boosters in their conclusions almost twice more frequently than their Iranian counterparts. Abdollahzadeh claimed that the comparatively limited use of such markers by the Iranian writers was due to their “higher professional and academic status and the high power distance they hold” (Abdollahzadeh, 2011, p. 295). The finding for attitude markers is not mentioned here, since it is not relevant to the present dissertation study.

Kranich (2011) reported on two studies on the use of epistemic modal verbs (e.g. may, will) in popular scientific articles written in English and German published over two time periods (1978-1982 and 1999-2002). Two types of German texts were used in the study, namely German translations of English texts and texts written originally in German. In the first study, Kranich analyzed the German translations of all English core modal verbs in the German translation texts. The main aim of this first study was to examine whether those English modal verbs were translated faithfully, or whether their epistemic modal strength was altered by the translators in which case the translators applied what Kranich referred to as cultural filter and thereby adapted to the German communicative styles which are diametrically opposed to the English communicative styles (House, 2006). Kranich found that translators made changes to the epistemic strength of the English modal verbs in the German translations for the two time periods,
with more modal verbs were altered their strength for the latter period (1999-2002). The alteration was toward “greater assertive force in the text overall” for the two time periods (Kranich, 2011, p. 90). Based on these results, Kranich (2011, p. 91) concluded that “a cultural filter is applied consistently and that it may even have become stronger through time.” For the second study, a mini corpus consisting of the first and last ten sentences of each text in the first study was generated. These sentences were closely read to identify not only modal verbs but all epistemic modal markers used in each of the three sets of texts. It was found that over the two time periods, English authors used more modal markers than authors of the German original texts. It was also found that while the former group of authors used modal markers of low epistemic strength more frequently than those of high epistemic strength, the latter group of authors used modal markers of high epistemic strength more frequently than those of low epistemic strength, and this pattern was evident in both time periods. For the German translations, the finding was corroborative of that of the first study. That is, the epistemic strength of the modal markers in the English original texts was altered in the German translation texts toward greater assertiveness. The findings of the second study cannot, however, be accounted for in terms of the application of cultural filter since the pattern evident in the German translation texts was markedly different from that evident in the German original texts. The proportion of the modal markers of low epistemic strength to the modal markers of high epistemic strength in the German translation texts mirrored that in the English original texts (a phenomenon called shining-through effect), where the modal markers of low epistemic strength were more frequent than the modal markers with low epistemic strength. In the German original texts, by contrast, the proportion of the modal markers
with low epistemic strength was smaller than those with high epistemic strength. Another surprising finding of the second study was that the German translation texts published during the first time span used more modal markers with low epistemic strength than the English original texts, meaning that the translators altered the strength of the modal toward greater tentativeness. These complex findings did not provide clear evidence whether sociocultural contexts determine the use of epistemic modality markers in research articles.

With the aim of understanding the cultural differences between English- and Arabic-speaking researchers, Sultan (2011) analyzed metadiscourse use in research articles written in the two languages. The analysis was focused on the discussion sections of 70 research articles (36 written in Arabic and 34 in English) from linguistics. The Arabic articles were drawn from one periodical published by the University of Jordan, whereas the English articles from five international journals. Only those articles written by native speakers of the languages were included in the corpus. Each of the discussions was read carefully in order to identify metadiscourse markers used. Given the focus of the present dissertation study, only the findings for hedges and boosters will be reviewed here. Sultan found that Arabic-speaking linguists used hedges significantly more frequently than their English-speaking colleagues: 25.02% of the total metadiscourse markers used in the Arabic articles were hedges, whereas in the English articles the figure was 22.50%. Likewise, boosters were also found to be significantly more abundant in the Arabic articles than in the English ones, although the difference was smaller than that found for hedges. Out of the total number of 1,243 markers identified in the Arabic corpus, 5.63% were boosters. In the English corpus, boosters accounted for 5.31% of the
total number of 1,053 markers identified. Commenting on the use of boosters by Arabic linguists, Sultan referred to the commonality nature of the features in Arabic academic writing (p. 37). The finding that Arabic linguists used boosters significantly more frequently than English linguists led Sultan to suggest a warning to Arabic linguists when they publish in international journals (in English): “when Arab researchers write in English, they should take this cross-linguistic disparity into consideration and avoid unjustifiable, strong assertion” (p. 37). Interestingly, although the aim of the study was to identify the cultural differences between the two groups of linguists, and although Sultan concluded by saying that the findings reported on in the paper “heightened our understanding of the cultural differences between Arabic and English concerning the use of metadiscourse in linguistics research articles” (p. 38), no specific culture-related explanation was offered in regard to the differential use of hedges and boosters by the linguists coming from the two cultures.

Pérez-Llantada (2010) compared the use of 31 epistemic lexical verbs in three corpora of biomedical research articles, each consisting of 48 articles: English articles written by Anglophone writers, English articles by Spanish writers published in the same journals as the articles by English native speakers and Spanish articles by Spanish writers. An epistemic modality verb was operationally defined by the researcher as “one of the textual realisations of epistemic modality and essential rhetorical devices related with writers’ manifestation of pragmatic politeness and hedging” (Pérez-Llantada, 2010, p. 26). Epistemic modality verbs were divided into judgmental and evidential types, where the former “show the writers’ positioning regarding the judgment or evidence of propositional contents” while the latter “indicate writers’ commitment based on evidence
or perceptions of unproven facts” (p. 26). The linguistic devices were analyzed in relation to the discourse moves and article rhetorical sections. The results showed that in the introduction and methods sections the Spanish corpus contained the highest amount of judgmental verbs and the English native corpus contained the lowest, whereas the Spanish English corpus stood in between. The reverse pattern was evident in the results and discussion sections, whereby the English native corpus contained the highest amount of the verbs and the Spanish corpus the lowest with the Spanish English corpus still occupying the same position. The patterns found for the use of evidential verbs were consistent across the four rhetorical sections. This time the Spanish English corpus was observed to contain the highest amount of such verbs followed by the English native corpus, and the Spanish corpus made use of such verbs least frequently. Based on these findings, Pérez-Llantada concluded that “research article genre indeed reflects the social context in which the texts are produced and received and, as such, responds strategically to the exigencies of social and culture-specific situations” (p. 40).

Resinger’s (2010) study set out to examine academic positioning or stance setting in research articles taken from the field of ecology written in English, Spanish and German. Academic positioning (stance setting) was operationalized as the degree of certainty, probability or assumption of an author in regard to a particular assertion. The 135,000-word corpus for the study consisted of 30 articles (10 from each language) written by the native speakers of the respective languages. There were seven categories of positioning expressions investigated in the study: compulsion (e.g. require, must, should), conviction (e.g. expect, predict, will), appearance (e.g. appear, evidence, apparently), probability (e.g. probable/ly, likely, unlikely), possibility (e.g. may, suggest, can),
hypothesis (e.g. would, could, potential(ly)), and supposition (e.g. might, assume). Resinger found that positioning expressions were present predominantly in the discussion section of the research articles in the three sub-corpora (English, Spanish and German). The difference lied in the average frequency (per 1,000 characters) of the positioning expressions found in the texts written in the three languages, with English articles contained the highest rate, and Spanish articles contained the least number of such expressions. The three sub-corpora also were similar in that the category of possibility was predominant in the discussion section, although English articles contained the highest number of expressions while Spanish articles the lowest, and German articles came in between. These differences in the use of possibility expressions were considered by Resinger as the reflection of differential “scientific culture and thought structure” (2010, p. 212) valorized by the members of the three language communities. Resinger (2010, p. 214) claimed that languages “go together with cultural values and thought patterns.” How the three language communities differ, leading to these differences, was left unexplained, however.

Abdi (2009) studied the use of metadiscourse marking in 72 research articles from six disciplines (sociology, education, psychology, physics, chemistry, and medicine) written in English (36 articles) and Persian (36 articles). Three of these disciplines (sociology, education and psychology) were chosen to represent soft sciences, while the other three (physics, chemistry and medicine) hard sciences. Of particular relevance to the present dissertation study is the study’s finding on the frequency of use of hedges and boosters across the two languages. Hedges were used by the English scholars (all disciplines combined) almost three times more frequently than the Persian scholars.
Boosters, on the other hand, were found to be statistically more frequent in the Persian articles, although the difference was not as large as that found for hedges. While Persian soft sciences contained statistically fewer hedges than the corresponding English soft sciences, Persian hard sciences used statistically more hedges than English hard sciences. For boosters, the pattern was the reverse: whereas in the soft science Persian articles used more boosters than English articles, in the hard sciences statistically more boosters were found in the English articles. The differential use of hedging and boosting by the two groups of scholars (English and Persian), according to Abdi, could be accounted for in terms of cultural variation: “It is difficult to argue that Persian writers show a lower degree of deference towards the discourse community or that they are more certain about their propositions, but it can be clearly said that there is a serious identity variation” (2009, p. 11). Abdi went on to say that “employing hedges and boosters, which involve evidence evaluation, is an area apparently more severely affected by the mentalities shaped within the framework of national culture” (p. 12).

Janik’s (2009) study was designed to examine evidentiality markers used in 20 German and 20 Russian research articles in historiography. Evidentiality markers are devices which indicate the speaker’s or writer’s attitudes towards a proposition being presented (Chafe, 1986). Evidential devices include certainty and uncertainty markers, which are boosters and hedging, respectively. The research articles analyzed in the Janik study were taken from three Russian and four German journals published between 1996 and 2002. In fact, Janik analyzed five evidential expressions used in the research articles under study, namely references to shared knowledge, underspecified sources, footnotes, certainty markers, and uncertainty markers. However, only the findings of the last two
devices will briefly be reviewed here, given their direct relevance to the issue being raised in the present dissertation study. As for markers of certainty, Janik found that German writers used them almost three times more frequently in their articles compared to their Russian counterparts. Similarly, markers of uncertainty were used by the German historians more frequently than their Russian colleagues, although this time the difference was not as large as that found for uncertainty markers. German articles contained the markers almost twice as frequently as Russian ones. Janik argued that these differences in the use of boosters and hedges can be attributed to “more general differences in writer-reader relationship in the respective academic cultures” (p. 29). That is, “the Russian academic texts serve rather to inform a reader than to invite him into a discussion about the newly presented knowledge” (p. 29).

Martin-Martin (2008) carried out a comparative analysis of hedges used in 40 randomly selected psychology research articles written in English (n = 20) and Spanish (n = 20) published between 2001 and 2005. Both sets of articles were taken from two leading journals in the field. The English corpus contained research articles which were written not only by native speakers of the language, but also by non-native speakers. On the basis of a preliminary analysis of a sub-group of articles (the researcher did not mention how many articles were examined at this analytical stage) taxonomy of hedges was developed. Such hedging taxonomy consisted of three strategies, namely (1) strategy of indetermination, (2) strategy of subjectivization and (3) strategy of depersonalization. Included in the first strategy were epistemic modality (e.g. may, think, possibility) and approximators (e.g. generally, approximately, relatively). The second strategy refers to the use of first-person pronouns followed by cognition verbs (e.g. I/we think). Also
included in this strategy were linguistic devices which clearly do not function as hedges, but rather as boosters such as the following adverbs: *extremely interesting, particularly important*. Martin-Martin reasoned that such adverbs function as positive politeness markers “as they show solidarity with the discourse community by exhibiting responses that assume shared knowledge and desires” (2008, p. 139). The third strategy “refers to those cases in which the writers diminish their presence in the texts by using various impersonal, agentless and passive constructions in order to relieve themselves of responsibility for the truth of the propositions expressed” (p. 139). The following is an example given by Martin-Martin to illustrate this strategy: *an attempt was made to see* …

In addition to passive construction, impersonal active construction (e.g. *The findings suggest* …) was also categorized into the third strategy. The coding method adopted in the study was to include all instances of mitigating (hedging) markers present in a sentence. For example, two hedging markers were considered present in *It is suggested that*, since it is delivered in passive voice and contains an epistemic lexical verb. Martin-Martin found that English writers used the first hedging strategy (epistemic modality and approximators) in all but the methods section of their articles more frequently than the Spanish writers. The reverse pattern was observed in the use of the second strategy (strategy of subjectivization). Spanish writers were also observed to make use of the third strategy (strategy of depersonalization) more frequently in all article sections than English writers. Another difference between English and Spanish writers was that while the former group of writers used the strategies of indetermination and depersonalization almost equally frequently, the latter group of writers used the strategy of depersonalization much more frequently than the first strategy. The similarity between
the two groups of writers was that they both heavily hedged their statements in the discussion and conclusion sections of their articles (sections where new claims are typically made or previous claims are challenged), and that they both used the strategy of subjectivization very infrequently. Another similarity was that the strategy of depersonalization constituted the most frequently-used strategy, although for English writers the difference in frequency of use of such strategy and the strategy of indetermination was very small.

Grossmann and Wirth (2008) investigated the use of expectation markers (e.g. obviously, of course, clearly) in 300 research articles, 150 written in English and 150 in French. The articles were drawn from three disciplines (economics, linguistics and medicine). It is to be noted that expectation markers are not only realized through boosters, but also through other linguistic expressions which do not have anything to do with conviction, such as consistent with, in line with. Here only those findings of the Grossmann and Wirth study directly relevant to the topic of the present dissertation study (the use boosters as expectation markers) are reviewed. A list of expectation markers was predetermined on the basis of the relevant literature prior to the commencement of the analysis. Grossmann and Wirth observed that English linguists used expectation markers slightly more frequently than English economists, 0.19 per 1,000 words and 0.14, respectively, while no single token was used by medical scholars. In French, linguists and economists were comparable in terms of their use of such markers (linguists, 0.31 per 1,000 words and economists 0.30), with writers from medicine using the markers less frequently (0.13). We can see here that French scholars from the fields were less tentative in their presentation of their propositions. The researchers suggested rather vague
explanations to account for these findings: “There could be a cultural explanation … and/or a linguistic explanation (the idea of congruence with the expectations may be conveyed by other linguistic means instead of specific markers)” (Grossmann & Wirth, 2008, p. 209). The researchers also conducted a separate analysis on the data for the use of *in fact*/*en fait*. They found that English linguists used the marker almost twice as frequently as French linguists (English, 0.40 per 1,000 words and French, 0.21), whereas French economists used it slightly more frequently than English economists (French, 0.16 and English, 0.10). The use of the marker by writers from medicine was comparably rare in both languages (English, 0.01 per 1,000 words and French, 0.02). According to the researchers, that English linguists used *in fact* almost twice more frequently than their French counterparts is triggered by the tendency of the former to be more argumentative than the latter.

Vold (2006b) investigated whether language, academic discipline and gender could influence the use of epistemic modality markers. To this end, she gathered 120 research articles from the disciplines of linguistics and medicine written in English, French and Norwegian taken from leading refereed journals. (She did not mention explicitly the publication years of such articles) The notion of epistemic modality markers was operationally defined as “*linguistic expressions that qualify the truth value of a propositional content* (for example *perhaps, probably*)” (Vold, 2006b, p. 65, italics in original). The epistemic modality markers being the focus of the study were identified manually from part of the entire corpus (i.e. exploratory corpus) composed of 30 articles. The resulting list of markers was subsequently searched for in the entire corpus. It should be mentioned that one inclusion criterion did not seem to fit the operational definition of
epistemic modality markers mentioned above. Vold (2006b, p. 72) reported that “all occurrences expressing an epistemically modal sense, regardless of who is responsible for the modalization, are included.” She included into the analysis the use of verbs such as in the following: *Hence, a fundamental problem with Kreitzer’s account …, is that it assumes that the rich understanding we obtain ….* The verb *assume* in this sentence fragment, strictly speaking, does not qualify as an epistemic modal verb, at least from the perspective of the writer of the sentence. It is not being used by the writer to qualify the truth value of the proposition following it (*the rich understanding we obtain…*), or in other words using such verb the writer does not convey the message that he or she is uncertain of the proposition. Rather, it is merely used as a reporting verb, whereby he relays the assumption made by Kreitzer. As for the language factor, it was found that English research articles (fields combined) contained significantly more of such markers than French research articles. Norwegian research articles were also found to be significantly different from French research articles in regard to usage of epistemic modality markers. However, there was no significant difference between English and Norwegian research articles. Vold conjectured that the similarity between English and Norwegian research articles in the frequency of use of epistemic modality markers, and the difference between research articles written in these two languages and those in French “may have to do with different academic cultures. Norwegian academic culture is to a large extent influenced by the Anglo-Saxon culture, and cultural difference between French- and English-speaking researchers” (2006b, p. 82). The finding for the discipline factor will be mentioned in the following section. The finding for gender is not
mentioned here for its absence of apparent relevance to the issue raised in the present dissertation study.

Koutsantoni (2005a) explored the effects of sociocultural characteristics on the degree of certainty in three sets of academic writing from the fields of electronic, electrical and chemical engineering, namely English research articles written by English native speakers (n = 17), English research articles written by Greek native speakers (n = 17) and conference papers written in Greek by Greek native speakers (n = 15). The English research articles by English and Greek native speakers were taken from the same Journals, and were published between 1989 and 2001. The conference papers were presented between 1999 and 2000. Density of occurrences of the certainty markers was “calculated by dividing the number of items by the number of lines of the articles” (Koutsantoni, 2005a, p. 131). Koutsantoni also included in the analysis modal certainty will as used in the following context: Our analysis will clearly show that one has to apply …. Another linguistic item included into the analysis, which is not typically considered as certainty markers (see Hyland, 2005a; Hyland, 2005b), was what Koutsantoni referred to as “discourse-based expressions of confidence.” Such expressions do not contain any explicit markers which suggest that the writers hold full commitment toward the proposition being presented, but rather contain subjective evaluative markers. The quantitative findings of density of certainty markers across the three corpora as revealed by ANOVA statistical analyses showed that the three corpora were significantly different. Koutsantoni argued that this difference in density of certainty markers is due to the fact that English and Greek cultures are different along the three cultural dimensions of uncertainty avoidance, individualism/collectivism and power difference (see Hofstede,
Hofstede, & Minkov, 2010). English culture is characterized by low uncertainty avoidance, individualistic and low power difference, whereas Greek culture is characterized by high uncertainty avoidance, collectivistic and high power difference.

Koutsantoni (2005b) analyzed the use of hedges and emphatics in 28 academic texts written in Greek by native speakers. Although this study was not a cross-linguistic or cross-cultural one, it was designed to investigate the effect of cultural characteristics on the use of the two rhetorical features. This is the reason behind the inclusion of this study into this section. Of the 28 texts analyzed by Koutsantoni, 15 were conference presentation papers from the fields of electronic and chemical engineering. The rest (13 texts) were student’s writing: two PhD dissertations, seven master’s level course papers and four final year honors theses. All of the students’ texts were collected from the department of electrical, electronic and chemical engineering. The finding for the conference papers was that emphatics were used more frequently than hedges. However, the difference was negligibly small, as indicated by the normed rate of use per line: hedges 0.05 and emphatics 0.06. Similar finding was also obtained for the students’ texts, although the difference was more substantial (0.02): hedges 0.02 per line and emphatics 0.04. It is to be noted that no inferential statistics were run on the data. This is quite surprising given the fact that in another publication reporting the same data the researcher reports inferential statistical results (see the study reviewed in the preceding paragraph). The tendency for the students to overemphasize relative to their corresponding engineers, according to Koutsantoni, “may be seen as a sign of the students’ unfamiliarity with the power struggles in scientific communities and the need for protection from possible criticism” (2005b, pp. 116-117). Koutsantoni concluded that there was a relationship
between Greek cultural characteristics and their pattern of use of hedges and emphatics in their academic writing. As in Koutsantoni’s words, such pattern “was thought to be in accordance with Greek’s society’s collectivist nature, its solidarity orientation, and the importance ascribed to the in-group” (2005b, p. 127). She went on to say that: “It was also related to the high uncertainty avoidance that characterizes Greek society, its need for certainty and absolute truth, and therefore its rigidity, dogmatism, and the need for a consensus” (p. 127).

Gross and Chesley (2012) conducted a study to examine the extent to which rate of use of hedges in biomedical research articles was influenced by the involvement of a sponsoring for-profit industry in the study being reported. The study can be conceived of as an attempt to uncover the extent to which the surrounding, local sociocultural context exerts any influence on the use of hedges. Two other factors which could potentially influence the use of hedges were also investigated. These were the impact factor of the journals in which the studies were published and the type of studies conducted (randomized control trial vs. non-randomized control trial). The corpus analyzed consisted of 308 biomedical research articles taken from 29 general and specialized medical journals. Gross and Chesley found that research articles reporting on a study sponsored by a for-profit industry contained fewer hedges than those reporting on a study where no for-profit sponsor was involved. Statistical test conducted by the researchers indicated that the effect was highly significant. The other two independent variables (i.e. journal impact factor and type of studies) were observed to have a marginally significant effect on the use of hedges: higher journal impact factor led to decrease in hedging rate, and studies reporting on randomized control trials used fewer hedges than those without
Gross and Chesley’s finding as regards sponsor involvement, as the above quote indicates, suggests that local sociocultural context can have a significant influence on the use of hedges.

Vassileva’s (2001) study explored the similarities and differences in the degree of commitment toward and detachment from a proposition in three sets of linguistics research articles: articles written in English by native speakers (British and American) and by Bulgarian speakers, and articles in Bulgarian by Bulgarian speakers. What Vassileva referred to as degree of commitment and detachment are exactly boosting and hedging, respectively. The English articles were taken from leading international journals, whereas the Bulgarian articles were collected from leading Bulgarian journals. From the analysis of 60 pages of research articles written in each language, the researcher found that native English writers used hedges the most frequently in their articles, Bulgarians writing in English the least frequently, and Bulgarians writing in their native language came in between: out of the total number of hedges identified in the entire corpus (of 180 pages of articles from the three languages), 42% came from English articles, 32% from Bulgarian articles and 26% from English articles in Bulgarians. The
picture emerging from the usage of boosters was the reverse of that for hedging usage. This time, Bulgarians writing in English used the devices the most frequently, English writers least frequently, with the other group (Bulgarians writing in Bulgarian) still occupying the same position: out of the total boosters gathered from the three corpora, 36% were present in English articles by Bulgarians, 34% in Bulgarian articles, and 30% from English articles by native speakers. Vassileva also found that modal verbs (e.g. *may*, *might*) were the most commonly used linguistic means of expressing detachment in all sets of articles, followed by epistemic verbs, such as *seem*. The three sets of articles were also similar in terms of the most frequently used linguistic means for expressing commitment, that is, adjectives/adverbs. Three explanations were offered by Vassileva to account for the finding for boosters: first, “Bulgarians [writing in English] are not familiar enough with the means of expressing detachment in English” (2001, p. 87), second, they “are unaware of the necessity to use hedges, thus failing to meet the expectations of the discourse community” and third, they “try to preserve their cultural identity … irrespective of the language they use” (p. 88).

Itakura (2013) compared the use of hedging in praise in English academic book reviews with that in Japanese book reviews. The data for the study consisted of 20 book reviews from each language and were gathered from four linguistics journals (two from each of the languages) published between 2002 and 2007. Although no attempt was made to ensure that the analyzed book reviews were written by native speakers of the two languages, the researcher “assumed that the reviewers in both sub-corpora were native speakers of their respective languages” (Itakura, 2013, p. 136). Included in the analysis were not only lexical hedges, such as modal verbs (e.g. *may*, *might*), epistemic verbs (e.g.
think, seem), epistemic adverbs (e.g. possibly, perhaps), and epistemic adjectives (e.g. possible, probable) but also first person pronouns (e.g. in my view, for the reviewer). Although it was not mentioned explicitly, it seems that the hedges in the book reviews were identified manually, without the help of any predetermined list of hedging items. It was found that the number of hedges in praise in the English book reviews was quite comparable with that in the Japanese book reviews: 171 in English and 189 in Japanese. However, the number of praise in the English book reviews without hedges was larger than that in the Japanese reviews: English, 89.5% and Japanese, 68.3%. In both groups of book reviews (English and Japanese), the same linguistic types were used, namely modal verbs, epistemic verbs, adverbs and adjectives, and personal attributions (i.e. first person pronouns), although verbs predominated in the Japanese book reviews, and adverbs and adjectives were the dominant linguistic types in the English book reviews. The difference between English and Japanese reviewers found in the study was concerned with the use of first person pronouns with epistemic verbs in the their hedged praise; while English reviewers tended to foreground their agency (structurally manifested through the use of first person pronouns in the subject position, for example I think), Japanese reviewers tended to suppress their agency (by omitting the first person pronouns occupying the subject position and using passive structures). Based on these findings (i.e. differential frequencies of use of hedges in praise and differing syntactic structures used with hedging verbs between the two groups of reviewers), Itakura argued that English and Japanese reviewers perceive praise differently in terms of face threat posed. That is, Japanese reviewers tended to see praise as more face threatening so that they hedged their
praise more often than English reviewers, and that the former group removed their agency from the act of praising.

The final study which needs to be reviewed here is a study which involved a novice writers, rather than expert writers composing research articles. Hatzitheodorou and Mattheoudakis (2011) examined the use of adverbials used as hedges, boosters and attitude markers in essays written in English by two groups of students: Greek and American university students. The aim of the study was to examine how the two groups of students projected stance to develop argumentation through the three persuasive devices. The data for the study were drawn from three corpora, namely Greek Corpus of Learner English (GRICLE, 177,490 words), Louvain Corpus Native English speakers (LOCNESS, 149,580 words) and Polish and English Language Corpora for Research and Applications (PELCRA, 25,467 words). The three corpora were checked against all adverbials on Hyland’s (2005a, pp. 220-222) list of hedges, boosters and attitude markers. The researchers found that the GRICLE corpus contained much more boosters than hedges. The English native-speaking corpora (LOCNESS and PELCRA), however, contained hedges more than boosters. Cross-culturally, while Greek students used boosters more frequently than the native speaker students, the latter group of students used hedges more frequently than the former group. According to Hatzitheodorou and Mattheoudakis, the finding that the Greek students used boosters much more frequently than the native speaker students “can be accounted for by the collectivism, high uncertainty avoidance and high power distance which are characteristic of Greek society” (2011, p. 241). Based on the findings, the researchers argued that: “Compared to native speakers, Greeks wish to project a confident attitude” (p. 243). The finding for attitude
markers is not mentioned here because of the absence of its direct relevance to the topic of the present dissertation study.

### 3.3 Cross-Disciplinary Studies into Hedging and Boosting Use

Bondi (2008) reported on a study which looked at variations in frequencies, meanings and functions of selected adverbs as emphatics used in English research articles from history and economics. The 2.5 million-word corpus for the study consisted of all articles from ten international journals from each of the fields, published in the UK and the US between 1999 and 2000. Bondi (2008, p. 36) reported that “No attempt was made to separate native from non-native speakers/writers.” The findings showed a significant difference between the two fields in terms of the range of emphatic adverbs used: in economics only two adverbs (*significantly* and *typically*) stood out as emphatics, whereas in history a greater variety of adverbs were used as emphatics (*certainly, undoubtedly, evidently, invariably*, and *clearly*). Bondi (2008) interpreted these findings along the following lines:

Interpreting frequencies in the light of disciplinary values may suggest that economics tends to place emphasis on a simplification of reality based on a process of abstraction (*typically*) and on statistics (*significantly*), whereas history places emphasis on frequency and accumulation of factual data (*usually, largely, inevitably, thoroughly, invariably* etc.), as well as their interpretation (as shown by a variety of epistemic markers). (pp. 38-39)

Comparing the use of the same adverbs (*certainly, undoubtedly, invariably, and significantly*) in syntactic terms, Bondi found that historians used these adverbs in initial,
thematic position much more frequently than economists. However, economists were found to use these four adverbs to modify adjectives or adverbs more frequently than historians, with the emphatic *significantly* showing the largest difference in this case. Moreover, compared to history, *significantly* in economics was predominantly used with statistical significance as their object. Another finding of the study was that three of the four above-mentioned emphatics (*certainly, invariably* and *significantly*) were pre-modified more frequently in history than in economics. According to Bondi, these trends can be related to the nature of the two disciplines: while economics pays more attention to abstraction by making reference to statistical norms, history puts emphasis more on detail and process, indicated by wider use of pre-modification.

Vázquez and Giner (2008) investigated the use of epistemic modality markers as hedges in 12 English research articles taken from three disciplines, namely marketing, biology and mechanical engineering. It was not mentioned explicitly from how many journals the articles were drawn. No mention was also made in regard to the nature of the journals (e.g. whether they are international or local journals) and the authorship of the articles (e.g. whether the articles were written by native or non-native speakers). The assumption of the study was that “Researchers in soft sciences may not be able to show the same confidence as researchers of hard sciences” (2008, p. 179). Therefore, the hypothesis developed for the study was that marketing articles would contain more hedges than biology and mechanical engineering articles, and since biology is less “hard” than mechanical engineering the former would use more hedges more frequently than the latter. The researchers found that their hypothesis was confirmed. Researchers from the field of marketing used hedges in their articles more than twice more frequently than
those from biology, and more than four times more frequently than mechanical engineers. Needless to say, biologists made use of hedges more frequently than mechanical engineers, although the difference was not quite large (3.90 per 1,000 words). Based on these findings, Vásquez and Giner concluded that “the differences in appearance of hedges in the three disciplines mainly depend on the nature of the data; on which point within the scientific continuum (abstract-concrete) a discipline is located” (p. 187). This is paramount to saying that there was a correlation between the frequency of use of the markers and the nature of the data dealt with within the disciplines. That is, the more mathematical the data the less frequently hedges were found in the discipline.

Using the same corpus as in their 2008 study reviewed above, Vásquez and Giner (2009) examined the frequency of occurrence of boosters. The researchers found that biology and mechanical engineering are close to each other in the frequency of use of boosters (biology, 5.16 per 1,000 words and mechanical engineering, 4.16). The number of boosters identified from the articles in the marketing discipline was almost twice as that found in biology (9.91 per 1,000 words). The conclusion reached by Vásquez and Giner based on these findings is exactly the same as that they offer for usage of hedges in their 2008 paper. According to them, the differential patterns of boosting usage found in the three disciplines are associated with the nature of data dealt with in these disciplines. They argued, for example, that the interpretation made of the data (which are non-mathematical and non-reliable) by marketing researchers is “subject to the readership’s interpretation,” and that “there is a stronger need to make those statements less subject to be negated” (p. 228). Commenting on the noticeable frequency of use of boosters in the discipline of mechanical engineering, Vásquez and Giner conjectured that they (boosters)
are used by the writers to further strengthen their statements in order to increase the chance that their claim is accepted by the readership. Finally, the intermediate position taken by biology in terms of boosting usage was interpreted by hybridity of the discipline, that is, biology is an interdisciplinary field, and thus is associated with both mathematical and abstract data.

Lafuente-Millán (2008) compared the use of hedges, boosters and approximators in research articles written in English across four disciplines: food technology, urology, business management, and applied linguistics. Examples of approximators analyzed in the study were *somewhat, approximately, often, mostly*. If we look at the semantic (perhaps also the pragmatic) function of these features, they behave much like hedges in that they enable the writers to avoid making categorical statements. The corpus for the study comprised of 96 articles from the four disciplines drawn from recent issues of high-impact international journals. There is no mention in the paper of the authorship of the articles (whether they were all written by native speakers of English) and the number of journals from which the articles were taken. Lafuente-Millán reported that “a list of lexical items (modal auxiliaries, epistemic verbs, adjectives, adverbs and nouns) that could convey epistemic or approximative meaning in a text was compiled” by consulting “the literature on the subject” (pp. 66-67). Lafuente-Millán also mentioned that “after perusing the articles, any other items identified as fulfilling those functions were added to the list” (2008, p. 67) but it was not clearly mentioned how this was conducted (e.g. how many articles were perused). As for the use of hedges, business management articles were found to use hedges and boosters most frequently and food technology the least frequently. Although applied linguistics articles used the two rhetorical devices more
frequently than urology, the difference between the two disciplines was found to be relatively small. For example, the difference between the two disciplines in terms of use of boosters was only 2.2 per 10,000 words. Since Lafuente-Millán did not run any inferential statistics, it is not possible to determine whether the two disciplines were statistically different from each other in this case. There was a similarity observed across the four disciplines in that hedges were used much more frequently than boosters. As for approximators, articles from business management and food technology were similar in their rate of use, and articles from urology and applied linguistics were comparable to each other, where the articles from the latter two groups used the devices more frequently than those from the former two groups. Again, with the absence of inferential statistical results we are not in a position to determine whether such superficial similarities are meaningful. On the basis of these findings, Lafuente-Millán stated that “a straightforward distinction between hard knowledge and soft knowledge disciplines is not feasible” (p. 73). What Lafuente-Millán basically argued is that discipline factor does not have any effect on the use of hedges, boosters and approximators.

Vold’s (2006a) paper reported findings of the use of 11 epistemic modality markers in English research articles from linguistics and medicine. Although she acknowledged that epistemic modality “does not only encompass expressions of uncertainty [hedges], but also expressions of certainty [boosters]” (2006a, p. 226), Vold only focused on the markers of the former. The linguistics articles were taken from four journals and the medical articles from three journals. The seven journals were prestigious refereed international journals. An exploratory corpus consisting of 10 articles from which the 11 epistemic modality markers of focus in the study were derived was
generated. From the analysis of 40 articles (20 from each discipline) the researcher found that there was no significant difference between the two disciplines as regards the relative frequencies of epistemic occurrences, indicating that discipline was not a factor which determined the use of such markers. However, the two disciplines were different from each other in terms of types of modality markers used: “seem, appear, assume and perhaps are used almost exclusively in the linguistics articles, while the use of could and possible is more or less restricted to the medical papers” (p. 234). According to Vold, unlike those found in the medical articles, the markers found in the linguistics articles “presuppose a personal evaluation” (p. 234). Vold concluded that “the use of epistemic modality markers in the two corpora can be taken to reflect the differences between the disciplines” (2006a, p. 245).

Peacock’s (2006) carried out a cross-disciplinary comparison of boosting in 216 English research articles from six disciplines (business, language and linguistics, public and social administration, law, physics, and environmental science). The study was focused on the frequency of use and forms of boosting used. Thirty-six empirical data-driven articles published in 2000 and 2001 in leading international journals were drawn from each of the disciplines. For the purposes of the study, “a list of 118 lexical items … was compiled from previous research on the topic …, dictionaries, and forms found in the RAs [research articles] themselves” (2006, p. 67). The study yielded empirical evidence that the two fields of language and linguistics and law were to some extent comparable in their use of boosters (10.98 per 1,000 words vs. 10.05, respectively). Articles from public and social administration were found to use 9.61 boosters per 1,000 words on average. Still smaller frequency of use of boosters was evident in articles from physics and
materials science (8.53 per 1,000 words). Finally, in the other two disciplines (Business and environmental science) the devices were observed to be used at comparable rates (7.84 vs. 7.57 per 1,000 words, respectively). In terms of forms of boosters, Peacock found that (1) the two sciences (physics and materials science, and environmental science) contained more boosters which indicate evidential and implicit truth than the other four so-called soft sciences; (2) the range of boosters used in the two sciences was narrower than that found in the other four disciplines; and (3) the boosting adverbs clearly, obviously, and of course “were rare in Environmental Science (0.26 per 1,000 words) and Business (0.28), but more than twice as common in Language and Linguistics (0.70 per 1,000 words), Public and Social Administration (0.67), Law (0.66), and Physics (0.73)” (2006, p. 71). The findings suggested, according to Peacock, that different disciplines are associated with different style conventions. It is interesting to note that he did not state whether different knowledge domains (hard vs. soft sciences) are different in terms of usage of boosting.

In Rizomilioti’s (2006) contrastive study, three disciplines (biology, literary criticism and archeology) were compared in relation to the use of epistemic modality defined as, following Coates (1995), “speaker’s assumptions, or assessment of possibilities, and, in most cases, it indicates the speaker’s confidence or lack of confidence in the truth of the proposition expressed” (Rizomilioti, 2006, p. 55). Three types of epistemic modality were the focus of the study, namely downtoners (i.e. hedges), boosters and indicators of certainty (i.e. linguistic markers such as show, reveal). The 200,000-word corpus compiled for the study consisted of English articles taken from five journals from each of the disciplines. (It was not mentioned how many articles were used
for the study) The articles were carefully chosen based on the following criteria: “the writers had to be native-speakers of English, the journals had to be representative of the field in terms of content (including a variety of topics), style, and country of publication and as recent as possible” (p. 56). Like some of the other studies reviewed in this chapter, a list of linguistic devices to be searched in the corpus was compiled a priori by consulting previous relevant studies. The following modal uses were excluded from the count in the Rizomilioti’s study: it must be noted that, it may be recalled that, may be regarded as, and it may be thought … but. One of the findings of the study was that the three disciplines were similar in that downtoners (hedges) were used much more frequently than the other types of epistemic modality. Archeology articles contained the most downtoners and literary criticism the least, whereas biology occupied the middle ground (archeology 13.3 per 1,000 words, biology 7.9 and literary criticism 6.8). As for boosters, however, literary criticism came first, followed by archeology then biology (literary criticism 2 per 1,000 words, archeology 1, and biology 0.6). When it came to the use of indicators of certainty, still another pattern emerged; this time biology was dominant over the other two disciplines (Biology 2.2 per 1,000 words, archeology 1.1 and literary criticism 0.4). These findings were interpreted by Rizomilioti as reflecting the nature of each of the disciplines. The high incidence of downtoners in archeology, for example, reflected the fact that such discipline deals with provisional knowledge, “open to insights offered by fresh evidence from further excavations” (Rizomilioti, 2006, p. 66). As for the difference between humanities and science in regard to the use of epistemic modality, Rizomilioti argued that “it is not always possible to generalize about
frequencies of epistemic devices in humanities and science as a whole, as each discipline reflects different conventions serving different purposes and different ideologies” (p. 66).

Hyland (2005b, 2008b) analyzed the use of stance and engagement markers in 240 English research articles from eight disciplines (philosophy, sociology, applied linguistics, marketing, physics, microbiology, mechanical engineering, and electrical engineering). Stance markers analyzed included hedges, boosters, attitude markers, and self-mention, whereas engagement markers included reader reference, directives, questions, shared knowledge, and asides. Here only the findings for hedges and boosters will be briefly reviewed. The 240 articles analyzed in the study were drawn from ten leading international journals, three from each journal. All the articles were searched for the existence of 320 items (i.e. stance and engagement features) determined apriori, which were collected from previous research, grammar books, “and from the most frequently occurring items in the articles themselves” (Hyland, 2005b, p. 178). The general pattern found by Hyland was that collectively disciplines which belong to social sciences and humanities (sociology, marketing, philosophy and applied linguistics) used more boosters than those belonging to sciences and engineering (physics, biology, chemical engineering, and electrical engineering). But this does not necessarily mean that each discipline in the social sciences and humanities used more boosters than those disciplines from the sciences and engineering. Articles from sociology, for example, contained fewer boosters than those from physics (sociology 5.1 per 1,000 words, and physics 6.0). It is to be noted that the difference in use of boosters between a social science or humanities and science or engineering was in some cases very small. Sociology was different from mechanical engineering by only 0.1 boosters per 1,000
words, and applied linguistics from physics by only 0.2. As for hedges, similar pattern was also observed. That is, disciplines belonging to soft sciences used the features more frequently than those belonging to hard sciences, although the difference between microbiology and sociology in terms of hedging use was relatively small (microbiology 13.6 per 1,000 words and sociology 14.7). Hyland claimed that his findings indicate that rhetorical practices are largely influenced by the nature of knowledge produced by the disciplines. Whereas the goal of hard scientists is to produce “knowledge able to withstand the rigours of falsifiability” (Hyland, 2005b, p. 187) the knowledge resulted from the soft sciences are more interpretive. It is to be borne in mind that this explanation is offered for the use of overall stance and engagement markers in the two knowledge domains.

Abdi (2002) reported on the findings of a study which scrutinized the employment of hedges and boosters in 55 research articles from natural (30 articles) and social sciences (25 articles). Although Abdi did not mention explicitly the disciplines chosen for the study, it seems that the natural sciences included physics, chemistry, and medicine, whereas the social sciences sociology, education and psychology (see Abdi, 2009). The findings showed that whereas hedges were used significantly more frequently by the writers from the social sciences, as for the employment of boosters the two groups of writers were not found to be significantly different from each other. Abdi speculated that the differential use of hedges by the two groups of writers has something to do with the distinct scientific phenomena they deal with in their research. As in his words, “Since NS [natural science] writers always report empirical and objectively observable phenomena, some of the uncertainty is removed” (2002, p. 142). According to Abdi, interpersonal
metadiscourse markers such as hedges and boosters are employed by writers to reach their audience in an attempt to persuade them of the validity of their (the writers) claims. Therefore, the less objective the claim made the more hedges will be used in order that such claim is accepted.

3.4 Discussion

One of the questions raised in this review of literature is whether the sociocultural context in which research articles are written has some effect on the use of hedges and boosters. The cross-cultural studies reviewed in this chapter generally have produced empirical evidence which seems to suggest that sociocultural context indeed does have some effect on the use of hedges and boosters. This is indicated by the fact that research articles written in (two or more) different languages did not contain hedges and boosters at comparable rates. Therefore, at least in terms of frequency of use of the two rhetorical features, the sociocultural context factor seems to some extent determines the rhetorical characteristics of the research articles. For example, Hu and Chao (2011) showed that English abstracts written by English native speaker applied linguists contained significantly more hedges than Chinese abstracts written by Chinese native speaker linguists, whereas the latter set of abstracts made use of significantly more boosters than the former set. Resinger (2010) also presented data which showed that English articles had more stance positioning markers than Spanish and German articles. Another piece of empirical evidence came from the translation study conducted by Kranich (2011): the epistemic strength of the modal verbs used in the German translation was greater than the epistemic strength of the modal verbs used in the English original texts, and the modal
verbs used in the English translation were used with greater tentativeness than the modal verbs in the German original texts.

However, if we examine the results of different studies on the use of hedges and boosters comparing the same languages the picture which comes out are quite different. As can be seen from the literature review presented in the preceding section, there are three studies examining the use the two rhetorical markers in research articles written in the same two languages, namely English and Persian. These studies are Zarei and Mansoori (2011b), Abdollahzadeh (2011) and Abdi (2009). These three studies produced rather different findings. While English articles in the Zarei and Mansoori (2011b) as well as in the Abdi (2009) study contained significantly more hedges than Persian articles, in the Abdollahzadeh (2011) study both sets of articles were comparable in terms of their frequency of use of hedges. Abdi’s study also showed that hard science articles written in Persian used significantly more hedges than those written in English. The findings for boosting use were also not consistent. While Persian articles in Zarei and Mansoori’s study contained significantly more boosters than English articles, those analyzed by Abdollahzadeh contained fewer boosters than English articles. Abdi’s findings are interesting: while Persian soft science articles made use of more boosters, for the hard science articles it was English articles which deployed more boosters. The findings from these three studies strongly indicate that sociocultural context might not be a factor which consistently determines the rate of use of hedges and boosters in research articles.

It could be argued that studies comparing the same languages provide the best empirical evidence in regard to whether or not sociocultural context constitutes the
determinant factor in the rate of use of hedges and boosters in research articles, regardless of the disciplines from which the articles are drawn or the articles sections from which the analyzed texts are excerpted. If it is indeed the case that the sociocultural context factor determines the use of such rhetorical features, all those studies should yield relatively the same findings, or in other words the direction of the findings should be uniform across the studies, for example all the studies (comparing the same languages) should find that English articles contain significantly more hedges than Persian articles, or vice versa. However, as has been mentioned above, such uniform direction was not evident in those studies. Another study which provided empirical evidence showing that sociocultural context did not seem to determine the rate of use of hedges in research articles is Martín-Martín (2008). Martin-Martín reported that both English and Spanish psychologists heavily hedged the discussion and conclusion sections of their articles. Still other inconsistent findings can be found in the study conducted by Grossmann and Wirth (2008), which examined the use of one particular boosting marker in English and French research articles (in fact and its French equivalent). The findings of this study showed that English linguists use in fact more frequently than French linguists use en fait. However, en fait is more frequently used in the economics articles than in the English ones. Again, if it is sociocultural context which determines the rate of use of boosters in research articles, the findings should be consistent across the two disciplines. The finding from Vold’s (2006b) study that English and Norwegian articles (from linguistics, medicine and economics) are comparable in terms of their rate of use of epistemic modality markers also suggests the same conclusion, that is, sociocultural context might
not be the determinant factor which influences the use of hedges and boosters in research articles.

This chapter also revolves around the question of whether the discipline factor plays a significant role in determining usage of hedges and boosters in research articles. A frequent assumption is that usage of hedges and boosters in research articles is a function of the kind of data being reported on. Obviously, the nature of data reported on in a soft science article (e.g. philosophy) is different from those reported on in a hard science article (e.g. physics), and such difference, it was argued, triggers differing frequencies of use of the two rhetorical features. According to Vázquez and Giner (2009), articles from soft sciences tended to contain more boosters than those from hard sciences since the statements made are based on data which are “rather inexact. In consequence, the need for creating more solid statements and certainty is stronger than in harder sciences” (p. 234). Similar argument for the more frequent use of hedges in articles from soft sciences was presented by Vázquez and Giner (2008). For them, the rather imprecise nature of data upon which new claims are made in soft sciences leads to greater negotiation of the information presented. Such explanation for the use of hedges in research articles is indeed consistent with the results of studies conducted by Abdi (2002) and Hyland (2005b, 2008b).

As clearly indicated by the review of studies in this chapter, past studies did not always support the idea that usage of hedges and boosters is closely linked to the nature of data being presented in the articles. Vold (2006a) found that there was no significant difference in the frequencies of use of epistemic modality markers in two sets of articles (linguistics and medicine), despite the fact that the new information conveyed in the
articles from the two disciplines are based on data of different nature. Nobody would
dispute that the data presented in medicine are typically, using Vázquez and Giner’s term,
more accurate or precise than those discussed in linguistics. The study carried out by
Rizomilioti (2006) produced empirical evidence showing that biology articles contained
more hedges than literary criticism articles. Comparable rates of approximators were
evident in articles from applied linguistics and urology analyzed in the Lafuente-Millán
(2008) study. Lafuente-Millán also found that articles from food technology and business
management made use of the features at similar rates. Although business and
environmental sciences belong to different academic tribes – the former is a soft science
while the latter a hard science – articles from the two disciplines analyzed by Peacock
(2006) used boosters at significantly comparable rates.

The discussion thus far in this section strongly revealed that the findings from
past studies on whether language or discipline or both determine the frequency of use of
hedges and boosters in research articles are inconclusive. There are at least two factors
which might have contributed to the inconsistency of findings of previous studies on
usage of hedges and boosters in research articles. First, studies designed specifically to
examine the influence of language or discipline or both on the use of hedges and boosters
in the genre are, to the best of my knowledge, scarce. This situation is quite surprising
given the fact that the study of hedges began in mid-1970s, and there has been an
increased interest in cross-linguistic and cross-cultural studies into academic writing
since the publication of Kaplan’s (1966) original article. Even more surprising is the fact
that the issue of usage of boosters in research articles, compared to the issue of usage of
hedges, has received relatively little attention from researchers. The inconclusive findings
in regard to whether language factor affects the frequency of use of hedges and boosters have also been the byproduct of the fact that very limited number of modern languages have been compared to English. In other words, there are still many languages other than English which escaped the attention of the researchers. It is arguable that the more languages examined and compared to English the more conclusive the findings will be. The comparison of other languages with English in cross-linguistic and cross-cultural studies of academic writing is hardly surprising. The cross-linguistic and cross-cultural studies into academic writing are largely conducted within the realm of English for academic purposes (EAP). The primary goal of such studies, in other words, is pedagogical in nature. Needless to say, EAP programs are designed to provide help for those non-native students and scholars alike to enter their academic discourse communities, to enable them to participate in those communities.

The second factor which is responsible for the inconsistency of findings of studies into the influence of language or discipline or both on the use of hedges and boosters in research articles is concerned with research methodology, to be more exact what counts as hedges and boosters (see also Crompton, 1997). There is no solid agreement among researchers regarding what linguistic features to be considered as hedges and what linguistic features to be regarded as boosters. Ambiguous cases are included in the count for boosters in the Vassileva (2001) study, e.g. must in the following sentence “However, since interactions are, simply, interactions, content domain knowledge must be viewed as a relative concept. By using the modal must, the writer can be interpreted as either making prediction about the content domain knowledge or directing the readers to view content knowledge as a relative concept. Used in the latter sense, the modal cannot be
considered as a boosting (or commitment) device to express conviction, but rather as a marker of obligation (see Halliday & Matthiessen, 2004, pp. 146-150). Another related methodological problem is that the same sentence is coded as both detachment marker and as commitment marker. For example, the sentence *Further research is obviously necessary in this direction* was coded as a hedge (detachment marker). However, the adverb *obviously* contained in it was counted as a booster (commitment marker). How is it possible that the same proposition is presented as a tentative and at the same time as definite proposition? A similar problem can also be observed in the study conducted by Vázquez and Giner (2008). A linguistic device which does not function as a hedge is categorized as a hedge. For example, the modal verb *should* in the following sentence, *This fact should not be omitted and the real strain gauge element length of a rosette used by measurement should be considered.* The two tokens of modal *should* were included into the analysis. Although *should* can be used as an epistemic marker to express probability (see Downing & Locke, 2006, p. 383), e.g. *It should be easy to reach York,* in the above context it is hard, if not impossible, to derive such epistemic reading of the modal, let alone as uncertainty marker. It seems that it is being used by the writer as an obligation marker (cf. *do not omit this fact*). Another study which unintentionally included into the analysis not only epistemic sense of the focused markers, but also their non-epistemic sense is Vold (2006a). For example, in explaining the differential use of epistemic modality markers found in linguistics and medical research articles, Vold provided the following account for the use of the markers in the medical articles:

*Could, may, might and possible …* refer to the notion of possibility and can be taken simply to state an eventuality, without presupposing a specific modalizing
agent. This is reflected in the fact that *could, may, might* and *possible* all can express root possibility in addition to epistemic possibility, something which might give them a veil of objectivity even in their epistemic uses. (2006a, p. 234)

The above account seems to indicate that the epistemic uses of the markers of interest in Vold’s study were not clearly differentiated from their non-epistemic uses (root sense). To put it another way, those markers used non-epistemically in the medical articles were unintentionally included into the analysis. To take just one example, it is extremely difficult to determine whether or not *could* in the following sentence is used as an epistemic modality marker, since in that context it can also have the sense ‘capability’: *A selection or reporting bias of this nature could explain some of the risk differences that we found* (Vold, 2006a, p. 241). Unless we consult the author, which seems to be almost practically impossible, the surrounding contexts (i.e. texts coming before and after that sentence) will not be able to provide any hint as to which of the senses (‘possibility’ or ‘capability’) is intended in that context. Therefore, Vold’s conclusion that epistemic modality markers are used differently across disciplines might need to be taken with caution. It might be the case that, should epistemic uses be strictly differentiated from the non-epistemic uses, the two disciplines under study were similar in terms of types of markers used. This in turn suggests that more similar studies (with more refined methodology) need to be carried out to clarify the issue.

### 3.5 Conclusion

In her latest book *Intercultural Rhetoric in the writing classroom*, Ulla Connor stated that: “Countless books, articles, and academic theses have focused on cross-
cultural aspects of writing and how writing is best taught” (U. Connor, 2011, p. 3). It is true, as has been mentioned in the introductory section of this chapter, that existing articles, books, and theses on cross-cultural aspects of academic writing are abundant. However, only a few of them specifically investigated the use of hedges and boosters in academic writing, more particularly in the genre of research articles. The same holds true of cross-disciplinary studies of the two rhetorical features in the same genre.

Although those existing studies have contributed significantly to our understanding of the characteristics of research articles written in different sociocultural contexts and different disciplines, it might be fair to say that our understanding of usage of hedges and boosters in research articles is still in its infancy. There has been no consistency among the results of those studies over whether the two factors of sociocultural context and disciplines play a significant role in the use of the features. This is by virtue of the fact that, to reiterate, the number of studies which have specifically been conducted to examine the use of hedges and boosters in research articles is still limited. Moreover, related to this scarcity of studies, a great number of modern languages in which research articles were written have not been explored. As a consequence, it is an urgent need to carry out studies which investigate the use of hedges and boosters in research articles written in languages (i.e. sociocultural contexts) which have not attracted the attention of previous researchers. Such studies will no doubt further our understanding of whether factors of sociocultural context and discipline determine the frequency of use of the two rhetorical features in research articles. The study reported on in this dissertation aims to contribute to such understanding.
Chapter 4 Study Design

4.1 Design of the Study

As has been mentioned earlier in the Introduction chapter, the central goal of the present study was to compare the use of the persuasive, interpersonal linguistic devices of hedges and boosters in research articles from the disciplines of chemistry and applied linguistics written in English and Indonesian. The study was geared towards describing generalizable patterns of language use (i.e. the use of these two interpersonal, linguistic resources) in the research articles from the two disciplines written by the native speakers of the two languages. More specifically, it was aimed at discovering whether the frequency of occurrences of the two interpersonal devices in the research articles was similar across the two disciplines and languages.

To achieve this very goal, quantitative corpus-based design was deemed necessary. Unlike qualitative research methods which often focus on in-depth discussion of very few texts, and hence generalizability of findings is not the goal to be achieved, quantitative method is “important for generalizable results” (Biber, 2009, p. 1287). Detailed discussion of the issue of the use of the two interpersonal features in a very few research articles would not provide an accurate picture of the issue of concern of the present study. Part of the reason would obviously be that research articles (in any language) are not uniform in terms of disciplinary content addressed, and this would no doubt affect the rhetorical characteristics of the writing; those fields addressing abstract issues (i.e. not dealing with physical, tangible material), for example, would heavily rely on argumentation to achieve persuasion (see Hyland, 2000). Even within the same
disciplinary field, as has been noted in the previous chapter, considerable variation could still be found. Among other things, the writer’s personal taste and contact with research articles written in other languages might also contribute to such within-discipline variation. Also, within the same disciplinary field research articles discussing different issues may display different rhetorical realization, perhaps caused by the different nature of data being discussed. All the aforementioned problems, I believe, can be solved using quantitative approach. The quantitative analysis of a sizeable number of texts from the two languages under study makes it possible to generalize the findings beyond the sample.

The design of the study was descriptive comparative (Schreiber & Asner-Self, 2011). First, the use of hedges and boosters in research articles in the two disciplines and languages was simply described and subsequently compared across disciplines within the same language and then across languages. As a consequence, there was no manipulation of any variable, except that the two corpora deriving from the research articles from the two disciplines and languages were made as comparable as possible (see below).

4.2 Corpus

4.2.1 Corpus Size

The corpus used for the purposes of the present study was generated from 104 research articles, which in turn contained two sub-corpora: a corpus of 52 Indonesian research articles (26 articles from the field of applied linguistics and 26 articles from chemistry) and another corpus of 52 English research articles (26 articles from applied linguistics and 26 articles from chemistry). The corpus size was determined on the basis
of the result of a priori power analysis conducted. Larsen-Hall (2010, p. 104) defines power as “the probability of detecting a statistical result when there are in fact differences between groups or relationships between variables.” It needs to be reiterated that the present study was specifically designed to investigate whether there was a significant difference between English and Indonesian research articles in terms of the frequency of use of hedges and boosters. To this end, as will be stated below, an inferential statistical tool typically used to compare two group means was employed. According to Larsen-Hall (2010), determining the sample size using a priori power analysis for such test requires the following parameters: i) significance (α) level (i.e. probability of committing type I error, that is concluding there is a difference when in fact there is not); ii) effect size or Cohen’s $d$ (i.e. the magnitude of the difference between the two groups under study); iii) power; and iv) specification as two-tailed (i.e. non-directional) test of hypothesis or one-tailed (i.e. directional) test.

For the purposes of the present study, an α level of 0.05 was set, which is a classic α level for social studies. Larson-Hall defines α level (or $p$-value) as “the probability that we would find a statistic as large as the one we found if the null hypothesis [i.e. there is no difference between the two groups under study] were true” (2010, p. 48). This means that any observed α level which exceeds the value 0.05 was considered in the present study as an indication of no difference between the two groups of RAs. Ideally, Cohen’s $d$ is computed on the basis of the results of previous published studies (i.e. means and standard deviations). Unfortunately, none of the previous studies reported on means and standard deviations. Therefore, a moderate effect size of 0.5, which is a common practice in social sciences (Faul, Erdfelder, Lang, & Buchner, 2007), was considered sufficient for
the present proposed study. A power level of 0.80, which is an optimal level of power (Larson-Hall, 2010), was set for the study. Finally, a non-directional test of hypothesis (two-tailed test) was carried out, on the grounds that there was no good theoretical reason to suspect that English writers would use significantly more hedges and fewer boosters than their Indonesian counterparts in the present study, or vice versa. The review of literature presented in the previous chapter does not seem to suggest a robust finding that English writers were more cautious (i.e. use more hedges) writers from different cultures. All of these values of the four parameters were entered into a computer program specifically designed for power analysis, that is G*Power version 3.1.3 (Faul et al., 2007). The output obtained for a study with the above mentioned values of parameters showed that 102 research articles, 51 from each language, were needed. However, since two disciplines from each language were analyzed in the present study 52 articles were taken from each language. Thus, instead of 102 research articles, 104 made up the sample of the study.

4.2.2 Corpus Construction

To serve as the basis for generalizations of the deployment of hedges and boosters in the disciplines of chemistry and applied linguistics in research articles written in English and Indonesian by the native speakers of the respective languages, the specialized corpus built for the purposes of the present proposed study had to be representative (cf. Biber, 1993). The major motivation for choosing chemistry and applied linguistics, as has been mentioned earlier, was that while the former can be considered as the representative of natural science (i.e. hard knowledge domain), the
latter can be regarded to represent the other knowledge domain (i.e. soft knowledge domain).

Needless to say, the target population of the study, therefore, was research articles from the two disciplines written in the two languages. Nevertheless, for purely logistical reasons (e.g. funding), the target population was operationally defined as all research articles from the two disciplines written by the native speakers of the two languages published in two online journals between 2007 and 2010. The collection of all research articles making up the target population constituted the sampling frame for the study, accordingly. The major reason behind choosing only two journals was that although it was relatively easy to download English research articles through Penn State University library, it was obviously difficult to find online journals published in Indonesian, let alone those with free public access. The decision to limit the publication year from 2007 was based on the premise that the RA genre, like other genres, is dynamic, and hence the description of the most current state of the genre was deemed suitable for a synchronic study. More importantly, online journal publication in Indonesia is a relatively new phenomenon, perhaps beginning in mid-2000s. Therefore, availability of online journals in Indonesian was also a consideration in determining the sampling frame for the present study.

Initially, it was decided that the articles included in the sampling frame would be taken from three online journals from each of the disciplines and languages. However, in the process of compiling the sampling frame two significant problems were encountered. First, it turned out that no single applied linguistics research article could be identified from one of the Indonesian journals. It was not surprising at all, since the journal in
question did not specifically publish articles from the field of applied linguistics; rather, the journal was mainly intended as the publication venue for those articles from the field of humanities (e.g. sociology). It seemed that this journal did not accept articles from the discipline of applied linguistics, at least during the specified time period (between 2007 and 2010). The second problem came from one of the English chemistry journals, where only three research articles written by English native speakers could be identified, accounting for only 3.7% of the total research articles making up the entire sampling frame for the discipline of Chemistry. Therefore, it was decided that only two journals from the two disciplines and languages were chosen for the present study.

To ensure the representativeness of the corpora (English and Indonesian) used for the present study, a probabilistic sample using simple random sampling technique was drawn from the collection of all research articles published between 2007 and 2010 in each of the disciplines written in each of the languages. This sampling technique refers to a sampling procedure wherein “all members of the population have the same probability of being selected” (Schreiber & Asner-Self, 2011, p. 87). A complete master list of the full set of research articles published in the two disciplines in the two languages over the four-year period was created. Such procedure resulted in a total of 306 articles (138 Indonesian chemistry articles, 81 English chemistry articles, 42 Indonesian applied linguistics articles, and 48 English applied linguistics articles). It is to be noted that all of these articles were written by the native speakers of the respective languages (see also below). Subsequently, with the help of True Random Number Generator program (http://www.random.org), a probabilistic sample of texts was generated. The generation of the sample was done separately for each of the disciplines and languages. As has been
mentioned above, such sampling procedure generated a corpus of 104 articles comprising of 26 English chemistry articles, 26 Indonesian chemistry articles, 26 English applied linguistics articles, and 26 Indonesian applied linguistics articles. The following table provides information about the size of the entire corpus, as well as of the sub-corpora making up the corpus.

**Table 4.1 Corpus Size (in words)**

<table>
<thead>
<tr>
<th>LANGUAGE</th>
<th>FIELD</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Applied Linguistics</td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>177,322</td>
<td>90,878</td>
</tr>
<tr>
<td>Indonesian</td>
<td>105,246</td>
<td>34,402</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>282,568</strong></td>
<td><strong>125,280</strong></td>
</tr>
</tbody>
</table>

As can be seen from the above table, the size of the entire corpus analyzed in the present study was 407,848 words. Table 4.1 above also shows that overall the size the English sub-corpus (i.e. the two disciplines combined) was almost twice as the size of the Indonesian sub-corpus (i.e. the two disciplines combined). In fact, in both disciplines the English scholars wrote much longer articles compared to the respective Indonesian scholars. The size of the English chemistry sub-corpus was almost three times the size of the Indonesian sub-corpus. The means (M) and standard deviations (SD) of the lengths of the articles in the four sub-corpora used in the present study (not shown in Table 4.1 above) were as follows: English applied linguistics (M = 6,820.08 words, SD = 1,070.53 words), English chemistry (M = 3,495.31 words, SD = 1,367.73 words), Indonesian applied linguistics (M = 4,047.92 words, SD = 1,105.29 words), and Indonesian
chemistry (M = 1,323.15 words, SD = 461.33 words). Thus, on average the English articles in both disciplines were longer than the Indonesian ones.

The resulting sample was carefully inspected to ensure that no two or more research articles were written by the same author. The major motivation behind this procedure was concerned with the goal of the study, viz. to arrive at the generalizability of the findings. It was assumed that including only articles written by different authors in a particular language would produce a more accurate picture of general rhetorical realization (i.e. in this particular case the deployment of hedges and boosters) prevalent in that particular language. There were two authors who were found to publish two articles over the four-year period resulting from the random selection from the sampling frame: one was from the Indonesian applied linguistics field and the other from English chemistry field. In this case, one of their works (i.e. the one identified later) was discarded, and another random sampling procedure (i.e. using the same sampling program mentioned above) was repeated to replace them. However, in the event that two articles were written by the same authors (multiple authors), which was common in the field of chemistry in both languages, but the order of the authors was different (i.e. the first authors of the articles were different) they were included in the sample articles. This practice was largely triggered by the assumption that the first author was typically the one who was responsible for the composition of the article, and hence even though two or more research articles were written by the same group of scholars, in so far as the orders of the authors were different, it could be expected that the rhetorical realization of the articles would be sufficiently different, irrespective of whether the articles discussed related issues.
Since there has been no robust findings which show that the gender of the writer (cf. Szymańska, 2013) or authorship (single vs. multiple authors) influenced the rate and forms of hedges and boosters (see review of the previous studies in the preceding chapter), the target population was not further stratified in terms of these two characteristics. In fact, studies into the use of hedges in oral academic discourse (e.g. Dixon & Foster, 1997; Poos & Simpson, 2002) showed that gender was not the determining factor. Moreover, since the present study was a synchronic, rather than diachronic, study no further attempt was made to stratify the target population in terms of year period.

In a comparative (i.e. contrastive) research such as the one reported on here, the comparability of the corpora under comparison making up the entire corpus is very crucial in order to derive a valid interpretation (U. M. Connor & Moreno, 2005; Moreno, 2008). Thus, the construction of the entire corpus for use in the present study was based on what Connor & Moreno refer to as “tertia comparationis,” defined as “common platform[s] for comparison” (2005, p. 154). The first tertium comparationis implemented in the present study was that, as has been alluded earlier, the two corpora (English and Indonesian) was drawn from the same number of online journals published over the same year period (2007-2010), that is, two journals. Controlling the publication period should methodologically be crucial in a contrastive rhetoric study. Diachronic studies of academic writing (e.g. Berkenkotter & Huckin, 1995; Gillaerts & Van de Velde, 2010) have shown that academic texts are not static over time in terms of their rhetorical realization, but rather dynamic in order to meet the current academic demands. The texts from the two languages had to be written by the native speakers of the respective
languages, judged from the name of the author (or from the name of the first author in the case of multi-authored articles). Thus, articles written by non-native speakers (especially in the case of English articles) were excluded from the master list of the sampling frame. This constituted the second tertium comparationis applied in constructing the entire corpus.

For the English corpus, only those articles written by native speakers of English affiliated with universities located in an English-dominant country (the U.S., the UK, Canada, Australia or New Zealand) were included in the sampling frame. An English native speaker living in Japan might to some extent be influenced by the Japanese culture, which in turn might affect his or her writing practice. This was the main reason why research articles written by native speakers of English affiliated with a university located in a non-speaking country were excluded from the sample of the present study. Indeed, very few such English articles were found during the building of the sampling frame. None of the Indonesian articles in both disciplines were written by a scholar who was affiliated with a university located in an English-speaking country.

Moreno (2008, p. 29) suggested that “two corpora are equivalent (or similar to the maximum degree) to the extent that the text exemplars contained in them may be considered similar in all relevant contextual factors” (emphasis in original). Since the English and Indonesian texts making up the entire corpus belonged to the same genre (i.e. research article genre), there was no doubt that “all relevant contextual factors,” such as text form (exposition), mode (written), participants involved (professors, graduate students, professionals), situational variety (formal), format (conventional research article structure), global communicative event (presenting findings from research), etc.,
embedded in the texts in the two corpora were relatively similar. These contextual factors needed to be controlled as far as possible since they would potentially influence the rhetorical features of the texts.

Admittedly, despite the application of the above tertia comparationis there were at least two confounding variables which might have affected the research results, but were beyond the control of the present study, namely the educational experiences and writing experience of the authors from the two language groups. For example, an Indonesian writer (writing in Indonesian) who pursued their Master’s or PhD degree in an English-speaking country might display a rhetorical move influenced by English academic writing. Although it was possible to find out the writing and educational experiences of the English writers from their academic curriculum vitae which might be available on the internet (e.g. personal website), Indonesian academics did not publish their academic curriculum vitae on the internet, making it impossible to get information about such backgrounds. Unlike English articles, Indonesian articles did not typically provide the email address of the authors, making it impossible to obtain their (i.e. Indonesian scholars’) information writing and educational experiences. Even such seemingly simple matter as native speakerness of the writer (judged in the present study from their name) might turn out to be a complicated issue. For example, the fact that a writer has an Anglo-Saxon name did not fully guarantee that he or she was a native speaker of English. Conversely, a writer having a non-Anglo-Saxon name might speak English as his or her native language, especially those who were born and have spent their entire life in English-speaking countries. Again, there was nothing which could be done to avoid this methodological problem.
For the Indonesian corpus, due to the limited availability of online journals, as has been noted earlier, two journals from each discipline which provide free access were selected. Both journals were monitored by the Indonesian Ministry of Education in terms of, among other things, language style (i.e. register), ensuring that they used standard Indonesian. They were peer-reviewed journals and published by top-ranked universities in Indonesia. Moreover, they were nationally-accredited journals, meaning that they were distributed throughout Indonesia only. Although it was not explicitly mentioned in the publication procedure of the two Indonesian journals from both disciplines, it seemed that the reviewing process followed blind peer-review method, where the name of the author and the university with which he or she was affiliated was removed from the manuscript. This is the accepted procedure widely adopted in Indonesia today. Admittedly, publishing in these journals was not as difficult as publishing in English-medium international journals. Another feature of Indonesian journals which distinguished them from their international journals was that they required the contributors to pay some amount of money in order that their articles were published, presumably for publication cost and reviewers’ service fee. The following table provides the names of the Indonesian journals from which the Indonesian corpus was generated.

**Table 4.2 Indonesian Journals**

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Journal</th>
<th>Publisher</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry</td>
<td>Jurnal Kimia</td>
<td>Universitas Udayana</td>
<td><a href="http://ejournal.unud.ac.id/new/detail-17-17-kimia.html">http://ejournal.unud.ac.id/new/detail-17-17-kimia.html</a></td>
</tr>
<tr>
<td></td>
<td>Majalah Farmasi</td>
<td>Universitas Gajah Mada</td>
<td><a href="http://mfi.farmasi.ugm.ac.id/">http://mfi.farmasi.ugm.ac.id/</a></td>
</tr>
</tbody>
</table>
Jurnal Kimia, first published online in January 2007, can be considered as a unique journal. Published twice annually in January and July, it only accepted original research articles, (i.e. articles which had not been published elsewhere) reporting on empirical research findings written either in Indonesian or in English (http://ejournal.unud.ac.id/new/guidline-17-journal-of-chemistry.html). Therefore, other forms of scholarly writing typically found in English-medium international journals, such as review articles and book reviews, as well as communication among scholars, were not welcomed in this journal. Unlike international journals, the incoming manuscripts were reviewed only by reviewers drawn from the department which published the journal, in this case the department of Chemistry of Faculty of Math and Natural Science, Udayana University. At the time the study was conducted, there were nine reviewers, seven of whom held a PhD degree and the other two had a Master’s degree. Like any other journal, Jurnal Kimia also placed constraints on manuscripts to be submitted. For example, the manuscript should not exceed 12 pages in length (single-spaced) and the referencing style should follow the one determined by the journal. As far as the structure of the manuscript was concerned, the journal required that the manuscript was divided into five main sections along with Title, Acknowledgement and References, namely Abstract, Introduction, Materials and Method, Results and Discussion, and Conclusion and Suggestion.

Published by the second oldest university in Indonesia, Gajah Mada University, Majalah Farmasi Indonesia had the academic vision that it “becomes the medium of communication among universities, researchers and stakeholders” (my translation), while one of its missions was “to promote the quality of academics and researchers in order to
produce research studies which are efficient and useful” (my translation, http://mfi.farmasi.ugm.ac.id/?pilih=hal&id=39). At the time of the study, the editorial board of this journal consisted of one chief editor, one deputy chief editor, two secretaries, and seven editorial members, all of whom held a PhD degree. The journal, which began its online publication in 2008 (Volume 19 Issue 1), published four times annually. Unlike Jurnal Kimia mentioned in the previous paragraph, Majalah Farmasi Indonesia accepted a wider range of articles, from research articles to review articles. Moreover, the latter journal did not provide in the submission guidelines any information about the sections making up the articles, although the articles were written following the format determined by Jurnal Kimia. It seemed that such format had become established within the field of Chemistry in Indonesia that no explicit information needed to be mentioned. Like Jurnal Kimia, Majalah Farmasi Indonesia also adopted internal peer-review process, that is, the incoming manuscripts were reviewed by the academics serving on the editorial board.

Linguistika, beginning its online publication in March 2007 (Volume 13 Issue 26), published twice annually in March and September and accepted only manuscripts reporting empirical research. It is to be borne in mind that this journal was not specifically dedicated to the publication of research studies into issues related to the field of applied linguistics only. Rather, other issues beyond the realm of applied linguistics were also accommodated by the journals, for example issues related to theoretical linguistics. Therefore, great care was taken to ensure that the topic raised in a paper somehow matched with that addressed in the corresponding English corpus. In some cases, it could be determined straightforwardly from the title of the research article. In the
event that the title was not sufficiently informative about the issue addressed, the article
Abstract was thoroughly read. Broadly speaking, the issues raised in the English applied
linguistics corpus were those closely related to language in use, language learning and
teaching. Special effort was therefore made in order to include in the Indonesian corpus
only those research articles addressing issues related to these areas.

Finally, Logat was relatively new compared to other journals previously
described. It was founded in April 2005 and launched its inaugural online publication in
2006 (Volume 2 Issue 2). Managed by the Department of Indonesian Language and
Literature of Faculty of Letters, Sumatra Utara University, this journal only published
articles on Indonesian language and literature, regardless of whether or not they reported
on empirical research findings. Therefore, any potential research article found in this
journal was carefully inspected in order that it met the selection criteria determined in the
present study. At the time the study was conducted, the journal published biannually in
April and October.

The selection of the two journals as the target population in the English chemistry
corpus was determined by the impact factor of the journals; only those with the highest
impact factor were selected. Another requirement for the English chemistry journal
selection was that those two journals were available at Penn State library to ensure that
access to the full text of the research articles was obtained. The last requirement was that
the issues addressed in the journals had to somehow match those addressed in the
corresponding Indonesian journals. For the applied linguistics corpus, however, the
impact factor of the journals unfortunately could not serve as a selection criterion, since
those journals with high impact factor were very subject-specific (e.g. Journal of Memory
and Language, Brain and Language), and they addressed issues which obviously were not addressed by Indonesian journals in the Indonesian corpus. Therefore, only two selection criteria were used in the selection of the journals, namely availability of the journals at Penn State Library and that the journals had to somehow address issues similar to those addressed in the Indonesian journals. The following table presents the journals from which the English corpus was derived.

Table 3. English Journals

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Journal</th>
<th>Publisher</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Carbohydrate Polymers</td>
<td>Science Direct</td>
<td><a href="http://www.sciencedirect.com.ezaccess.s.libraries.psu.edu/science/journal/0148617">http://www.sciencedirect.com.ezaccess.s.libraries.psu.edu/science/journal/0148617</a></td>
</tr>
<tr>
<td>Applied Linguistics</td>
<td>Applied Linguistics</td>
<td>Oxford University Press</td>
<td><a href="http://applij.oxfordjournals.org.ezaccess.s.libraries.psu.edu/content/by/year">http://applij.oxfordjournals.org.ezaccess.s.libraries.psu.edu/content/by/year</a></td>
</tr>
</tbody>
</table>

It should be mentioned here that the territory where the journals were published (i.e. whether or not in the U.S) was not controlled here. The assumption underlying the present study was that the international English journals included in the corpus were published to meet the agreed-upon Anglo society expectations, especially Anglo-American expectations. A very telling evidence for this claim came from a study into language correction provided by both native and non-native speakers of English on manuscripts intended to be published in international journals, where the readers providing the correction conformed to the Anglo-societal practice in relation to hedging deployment (Burrough-Boenisch, 2005). Thus, although a journal was published by a
German publisher as in the case of the English chemistry journal *Advanced Synthesis and Catalysis* and the English applied linguistics journal *International Journal of Applied Linguistics*, it was not difficult to notice the American rhetorical practices adopted.

The journal *Advanced Synthesis and Catalysis* had a 2010 impact factor of 5.25 and a five-year impact factor of 5.36, placing it first among 70 journals within the category of applied chemistry. This monthly journal started its publication in 1834. It is interesting to note that the journal, between 2007 and 2010, was dominated by non-native speakers of English. Thus, over the four-year period only 42 native speaking contributors could be identified.

With a 2010 impact factor of 3.463 and a five-year impact factor of 3.659, the journal *Carbohydrate Polymers* also published monthly, and occasionally twice a month (e.g. July 2010). This journal was ranked third within the category of applied chemistry at the time of the study. Like *Advanced Synthesis and Catalysis*, this journal was also dominated by the non-native speakers of English, where only 36 English native speaking authors were able to be identified from 2007 to 2010. The journal with the second highest impact factor, *Molecular Diversity*, was not included into the target population, since, as has been mentioned earlier in this chapter, contributions from native speakers of English could hardly be found.

Within the category of linguistics, among 141 journals *Applied Linguistics* was ranked 24th in 2010 with an impact factor of 1.34 and a five-year impact factor of 2.068. This journal, which published four times annually (the months of publication were not fixed), welcomed contributions from a very wide range of areas related to language use and learning and teaching, both those reporting original research and conceptual articles.
Moreover, other scholarly writing, such as book review, was also welcomed in this journal. The orientation of the journal was more theoretical than practical, according to the statement published on its website.

As can be seen from the table 2 above, the last journal included in the target population for the English corpus was *International Journal of Applied Linguistics*. The impact factor of this quarterly journal, which published in March, July and November, could not be found. Quite contrary to the applied linguistics journal mentioned in the preceding paragraph (i.e. *Applied Linguistics*), this journal welcomed articles which addressed the “So what?” dimension of language study. That is, the incoming articles were encouraged to provide a practical solution to real-world language problems. The adjective *International* added to the name of this journal was meant to encourage submissions which discussed local linguistic issues from different regions and related them to the global issues, according to the statement put on its website. Finally, this journal did not only publish articles reporting on empirical (original) research, but also book reviews in every issue.

The entire corpus was generated from the following research article sections, namely Introduction, Theoretical Framework (Literature Review), Results, Discussion, and Conclusion. The majority of the articles published in the English and Indonesian journals (both disciplines) included in the target population for the present study had all these sections. Introduction is the place where the authors have to make the case that the research being reported on is indeed significant (Swales, 1990), and hence serves as an ideal place to use hedges and boosters. In the Theoretical Framework/Literature Review, the authors typically make an argument that previous research cannot solve the problem
being discussed in the articles, a rhetorical move which undoubtedly triggers the use of interpersonal devices. In the sections Discussion and Conclusion, the authors, respectively, interpret and propose the implications (theoretical or practical or both) of the findings presented in the section Results, a rhetorical activity which involves speculation and hence modalization of propositions is almost inevitable. The inclusion of Results in the corpus was largely triggered by the fact that the sections Results and Discussion were collapsed into one section in the Indonesian journals, rather than two as in the case in the English journals, and it was difficult to identify the boundary between the two sections in the Indonesian journals. In fact, there was no clear-cut boundary which could readily be identified between these two sections. More often than not, the Indonesian applied linguists presented their findings in the Results and Discussion section one at a time which subsequently was followed by interpretation of that finding. The abstract of the article was not included in the corpus. The study conducted by Gillaerts and Van de Velde (2010) showed that RA Abstract displayed rhetorical features which were sufficiently different from other parts of the article, enabling the researchers to conclude that the RA Abstract belongs to a different (independent) genre. Moreover, titles, tables, charts, words associated with the charts and tables, blocked citations and the references were also not included in the corpus. This was done primarily for the sake of quantification of hedges and boosters. The present study relied on the normalized frequency of these linguistic features for the quantitative analysis (see below). As can be expected, English and Indonesian research articles were different in terms of the number of references cited in the texts. Thus, including references in the corpus would no doubt affect the word count, which in turn would affect the normalized frequency of hedges and
boosters. The abstracts, tables, charts, blocked citations, etc. were removed by first converting the original pdf documents of the research articles into Word 2010 documents using Adobe Acrobat Professional version 10.1.1.

4.3 Identification Method

With the exception of the study conducted by Gillaerts and Van de Velde (2010), the majority of past studies identified the interpersonal devices of interest in the corpus by means of a computer program, such as the Find function in Microsoft Word processor (e.g. Peacock, 2006). This was enabled by the a priori generation of a list of the linguistic items used in research articles derived from previously conducted studies. In the present study, however, such purely computer-based approach was not possible due to the impossibility of generating similar list, since, as has been noted before, no study had been conducted on the use of hedges and boosters in Indonesian articles.

One might argue that a purely computer-based method could still be adopted in the present study by translating the existing English list of hedges and boosters (e.g. Hyland, 2005a) into Indonesian language before a computer search was conducted in the Indonesian corpus. This methodological practice would be based on the obviously misleading assumption that the two languages operate along the same linguistic lines. The fact that the two languages belong to completely different language families, viz. English is a member of Germanic language family and Indonesian is a member of Austronesian language family, was sufficient evidence to suggest that searching for translated linguistic items in the Indonesian corpus would result in an inaccurate picture of the use of hedges and boosters in Indonesian research articles. Moreover, doing so
would wrongly assume that Indonesian research article writing slavishly follows the English one. In fact, no previous studies into the use of hedges and boosters have adopted such approach, which further confirmed that the approach was not to be considered methodologically sound. Therefore, the only option available for the present study was to manually identify the linguistic devices manifesting hedges and boosters in the Indonesian research articles.

Unfortunately, using purely manual search through careful reading of each of the 52 Indonesian research articles would no doubt turn out to be a tedious activity which would take an extremely long time. Thus, consideration of time available to finish the study also made such identification method practically unfeasible. If forcefully done over a short period of time, the fatigue resulted from such manual searching would “spill over” to the process of identification of linguistic devices under study in the corpus. That is, some devices might escape the researcher’s attention and some other devices would wrongly be identified as hedges and boosters.

Taking these issues into consideration, a combination of manual and computer-based searches was employed to identify hedges and boosters in the Indonesian corpus of 52 research articles. First, over twenty five percent of the articles from each of the disciplines in this language (i.e. seven articles from applied linguistics and seven from chemistry) were thoroughly read to identify the hedges and boosters used. Such 14 articles which were carefully read were randomly selected from the entire corpus of each discipline. The random selection was conducted with the help of Random Number Generator program available for free on the internet (www.random.org). Then, two
independent lists of linguistic devices were generated from this manual reading: Indonesian chemistry list and Indonesian applied linguistics list.

The resulting lexicons functioning as hedges and boosters in the Indonesian corpora were then checked against the list of English hedges and boosters provided by Hyland (2005a, Appendix). It is to be noted that the decision to use Hyland’s list as the baseline against which the resulting list of lexicons was checked was because Hyland is up to the present time the most authoritative scholar in the field. It should be borne in mind that the extent to which a lexicon was included in the analysis was not solely determined by the presence of its English translation in Hyland’s list. Some of the lexicons included in the analysis in the present study could not be found in Hyland’s list. Moreover, each of the lexicons was also checked its definition in the most comprehensive Indonesian dictionary to make sure that it really functioned as a hedge or booster. The dictionary was available online (http://bahasa.kemdiknas.go.id/kbbi/index.php). This dictionary was maintained by Kementerian Pendidikan Nasional (Kemdiknas) Republik Indonesia (The Ministry of National Education of the Republic of Indonesia). The list was not presented to any native speaker of Indonesian to judge the validity of the lexicons, although it was possible to find a few Indonesian native speakers who might be willing to carry out the task (i.e. to judge whether, for example, a word was really a hedge). There were two reasons associated with this decision. First, this was not a methodological preference in previous studies. Second, perhaps being the reason why native speakers were not consulted to judge the validity of the lexicons in previous studies, the fact that someone is a native speaker does not guarantee that he knows his or her native language well, let alone such subtle aspect as hedging and boosting.
In a contrastive rhetoric study such as the one reported on in this dissertation, the comparability of the corpora under study is not the only aspect which needs serious attention. Comparability of the methodological approach implemented on the two corpora is no less important, if valid findings are to be derived from the study. Therefore, although in the present study it was possible to generate a priori list of English hedges and boosters from previous studies (The Hyland, 2005a list was quite often used in previous studies), exactly the same methodological procedure as that adopted for the Indonesian corpus described in the preceding paragraph was followed in the process of identification of hedges and boosters in the English corpus. The adoption of uniform methodological procedure across the two corpora in the present study (English and Indonesian) was also triggered by the belief that, as has been mentioned in the previous chapter, discourse is dynamic, rather than static. Basing a study on the list compiled from research conducted more than half a decade ago would be tantamount to saying that language use does not change over time. The dynamism of discourse (in particular, written discourse) in research articles has been shown by a recent study by Gillaerts & Van de Velde (2010). The study discovered that the usage of boosters in applied linguistics research article abstracts gradually decreased from 1980s to 2000s, whereas that of hedges experienced a relatively steady increase. Although the study did not report on the linguistic devices used to realize hedges and boosters, it would not be unreasonable to suspect that such frequency variation might be followed by variation in linguistic realizations.

The four lists of lexicons mentioned above were subsequently used as the basis for the computer-based search in the rest of the respective corpora (Indonesian chemistry
and Indonesian applied linguistics). The search was done with the help of the Advanced Search function in the Adobe Acrobat Professional X program. When searching the hedges and boosters in the four sub-corpora, especially in the Indonesian corpora, it was not that only those words were searched. It is to be noted that they were only the stems of the actual words found the sub-corpus which were manually read. Thus, all derivative words of those stems were also searched. For example, when searching the stem asumsi ‘assume’ in the Indonesian corpora all the possible derivative words of this word stem (diasumsikan ‘be assumed’, mengasumsikan ‘assume’, berasumsi ‘assume’) were also entered into the search box.

It is to be noted that no native speaker of Indonesian and English, especially that who specialized in language-related disciplines such as linguistics and language education, served as co-rater to produce inter-rater reliability. This constituted one of the major limitations of the present study.

4.4 Identification of Linguistic Items

The approach adopted in the process of identifying the linguistic features of interest in the present study (i.e. hedges and boosters) was a semantic-pragmatic one. That is to say, the determination of a linguistic device as a potential hedging or boosting device was entirely based on the semantic and pragmatic content of the proposition containing the linguistic features which could readily be determined from the immediate textual context surrounding it. This means that in the process of identifying the hedging and boosting devices in the present study all linguistic items contained in a proposition were treated as potential hedges and boosters. In other words, attention was not only paid
to those items which had been recognized in previous studies as hedges and boosters, since such items could also be deployed in their non-hedging and non-boosting sense.

In reading a sentence, first of all an effort was made to find out how many propositions were contained in it. (For the operational definition of a proposition adopted in the present study, see the following sub-section below) Then, each proposition identified was carefully inspected to see if it was stated with some degree of certainty. If it was, then it was decided whether the degree of certainty was strong or weak. During this stage, it was possible to determine which of the lexical items making up the proposition showed the writer’s degree of certainty. To illustrate this seemingly complicated process, consider the following sentence.

[1] Reference to the proposed reaction pathways for amid reduction (Scheme 1) suggests that CyCH\textsubscript{2}OH formation may occur via competitive hydrogenolysis of the intermediate aminocarbinol with the loss of ammonia (hence the reasoning for the conventional addition of NH\textsubscript{3} to suppress secondary amine formation). (CH)

Through careful reading of the above sentence, three propositions could be identified in it, namely the matrix proposition which is the entire sentence and two other propositions embedded in the matrix proposition. The first embedded proposition is CyCH\textsubscript{2}OH formation may occur via competitive hydrogenolysis of the intermediate aminocarbinol with the loss of ammo, whereas the other is hence the reasoning for the conventional addition of NH\textsubscript{3} to suppress secondary amine formation. Of these three propositions, only two are stated by the writers with certain degree of certainty, more accurately weaker degree of certainty, as shown by their deployment of the hedges suggests and may.
4.4.1 Unit of analysis

In the identification of the linguistic devices used by the authors as hedges and boosters in both English and Indonesian corpora, proposition was used as the unit of analysis. The term ‘proposition,’ as employed in the present study, needs further clarification. Quite contrary to the traditional definition of the term (e.g. Lyons, 1977), it was employed in the present study not only to refer to the core meaning of a clause or sentence, but also to the meaning of units making up the core meaning. This methodological practice was the one adopted by Hyland (1998b) in his study of hedges in English RAs in the field of Cell and Molecular Biology. A unit of meaning was considered a proposition when such unit carried the writer’s world view. Therefore, the following sentence was considered as containing three propositions, rather than one.

[2] *Spelling may be disrupted to suggest a particular accent or style, as when Boxer toasts Castaway in message 27 with ‘Casty, my pleasure, darlin’*. (AL)

The first proposition contained in the above sentence is concerned with the extent to which spelling is disrupted in online chat conversation (*Spelling may be disrupted*). The second proposition is concerned with what function such spelling disruption fulfills (*Spelling may be disrupted to suggest a particular accent or style*), and the last proposition shows what Boxer does during the chat (*Boxer toasts Castaway in message 27 with ‘Casty, my pleasure, darlin’*). This identification method led to the inclusion of the hedges *may* and *suggest* into the analysis. Similarly, the major proposition carried by sentence [3] below was considered to be decomposed into two component propositions,
namely [3a] and [3b], and hence the adverb sangat ‘very much’ was included into the count as a booster.

[3] *Keduanya saling berhubungan dalam setiap kegiatan berbahasa dan korespondensi secara berkesinambungan yang sangat diperlukan untuk mengomunikasikan gagasan diantara sesama penutur.* (AL)

(‘Both are constantly interrelated in any linguistic activity and correspondence which are very much needed to communicate ideas between interlocutors’) (AL)

[3a] *Keduanya saling berhubungan dalam setiap kegiatan berbahasa dan korespondensi secara berkesinambungan.*

(‘Both are constantly interrelated in any linguistic activity and correspondence)

[3b] *Keduanya sangat diperlukan untuk mengomunikasikan gagasan diantara sesama penutur.*

(‘Both are very much needed to communicate ideas between interlocutors’)

### 4.4.2 Identification of Hedges

In the identification of hedges in the present study, the definition of a hedge proposed by Hyland (1996) was strictly adhered to: “A hedge is … any linguistic means used to indicate either (a) a lack of complete commitment to the truth of a proposition, or (b) a desire not to express that commitment categorically” (p. 251). Thus, the underlined linguistic devices in the following sentences satisfy this requirement to be considered as hedges, since they are employed by the authors to withhold complete commitment to the proposition being presented.
A possible explanation for the observed order of reactivity primary > tertiary > secondary > amide is that the greater degree of steric hindrance presented by N-methyl substituents acts to hinder absorption. (CH)

Bahasa yang digunakan dalam komunikasi pada umumnya tidak bersifat monolitis, … (AL)

(‘The language used in communication generally is not monolithic in nature, …’)

Any hedge found in a sentence used by the author(s) to cite other authors’ viewpoint was excluded from the analysis in the present study. Typically, such sentence had the cited author as the grammatical subject, as in sentence [6] or started with the citing phrase as in [7] below. When a hedge was used in this way, it was very clear that the author(s) merely reported the tentative statement of the cited author, rather than stated their own viewpoint. In other words, the hedge did not represent the author’s own voice.

Landerito and Wang (2005a) proposed that the branching structure of amylopectin may retain more phosphates in the crystalline region for phosphorylation (CH)

Menurut Chomsky dalam Dardjowidjoyo manusia mempunyai apa yang dia namakan faculties of the mind, yakni semacam kapling-kapling intelektual (abstrak) dalam benak otak mereka, … (AL)

(‘According to Chomsky in Dardjowidjoyo human beings have what he terms faculties of mind, a kind of intellectual modules (abstract) in their brains, …’)

It is to be noted that not all hedges which were used in sentences containing one or more citations were discounted from the analysis in the present study. In many cases, it was
fairly straightforward to determine that the hedges used indeed derived from the authors, rather than the cited authors. Consider the following sentence.

[8] *Typically the kinetics of drug release from swellable matrices depends on the structural features of the hydrogel and the processes of hydration and swelling of the polymer carrier, with the gel layer formed around the glassy core being the main controlling factor* (Michailova, Titeva, & Kotsilkova, 2005; Michailova, Titeva, Kotsilkova, Krusteva, & Minkov, 2001) (CH)

In [8] above, based on the two previous studies cited the authors somewhat cautiously states, through the use of the adverb *typically*, the dependence of “the kinetics of drug release” on “the structural features of the hydrogel and the processes of hydration and swelling of the polymer carrier.” In short, the hedge *typically* in the above sentence does not belong to the cited authors, but rather it represents the stance of the authors of the article. Of course, there is the possibility that the hedge *typically* is indeed deployed by the cited authors, and hence one might argue that such hedge might actually not originally represent the voice of the current authors. However, regardless of whether or not such possibility turns out to be true, there is good reason to believe that the hedge is used by the authors (i.e. current authors) to withhold full commitment to the proposition being presented; there is nothing in that sentence and the surrounding context which indicates otherwise. Even though such possibility does indeed hold true, that the hedge *typically* is used by the cited authors, it would seem reasonable to argue that through the use of such hedge similar viewpoint is also appropriated by the current authors, making it their own voice. A great deal of similar rhetorical practice is also observed in Indonesian corpora (applied linguistics and chemistry) and English applied linguistics corpus.
When two epistemic markers were present in the same proposition (sentences [9] and [10] below), both were included in the count.

[9] … it would seemingly be less bound by the need to achieve profitability. (AL)

[10] … it may indicate the vocabulary size necessary to understand a text as well as to incidentally learn words in the text. (AL)

The use of the adverb seemingly in [9] and modal verb may in [10] above was intended by the writers to further mitigate the strength of the proposition presented.

The Indonesian modal verb dapat ‘can’ used before dynamic verbs (i.e. verbs denoting action) can be used to express possibility (epistemic meaning), ability (root meaning) and permission (deontic meaning). Alwi (1992, Chapter 3) stated that when dapat is used side by side with another epistemic marker, the modal verb loses its epistemic meaning, but the root meaning is retained (Alwi, 1992, p. 105). Therefore, since the present study dealt with the expression of epistemic meaning through hedges and boosters, also excluded from the analysis was the modal verb dapat when used in juxtaposition with another epistemic marker expressing possibility meaning, as in the sentence [11] below.


(‘The presence of the protein and enzyme perhaps can absorb water from its surrounding’)

Even when dapat was used in construction such as Dapat disimpulkan bahwa ‘It can be concluded that’ (where it was not used with another epistemic device), construction
which constitutes a prefabricated chunk in Indonesian research articles in both disciplines found usually in the conclusion section, it was still extremely difficult to determine whether dapat in such linguistic context was used epistemically or in its root meaning. In *Dapat disimpulkan bahwa* it is not clear whether the writer intended to conclude tentatively (i.e. using the modal as an epistemic marker) or he or she used the modal in its root meaning to mean ‘From the above evidence, I am in a position to (be able to) conclude that’ (which implies that the writer is confident in the validity of the conclusion drawn). For this very reason, dapat was not included in the analysis. It was also true of the English modal can. Therefore, it would not be unreasonable to assume that dapat and can may not be a reliable hedge. This might be the reason why Hyland (2005a) does not include can as a hedge in his list. Can was also excluded from the analysis.

### 4.4.3 Identification of Boosters

In identifying boosters in the corpus, Hyland’s (1998a, p. 350) definition of the concept was used as the point of departure: “Boosters … allow writers to express conviction and assert a proposition with confidence, representing a strong claim about a state of affairs.” Therefore, in the present study while the modal will in sentence [12] below was included in the analysis, the modal akan ‘will’ in sentence [13] was not since the latter did not seem to display the writer’s confidence in the proposition being presented.

[12] … *the decision about which form or structure to use will be made without conscious reflection.* (AL)
Dari 6 sampel yang diisolasi dengan menggunakan metode MPN, dimana bakteri ditumbuhkan dalam mEC broth, diperoleh 18 kultur yang akan dideteksi gena fliCH7 dengan menggunakan metode PCR. (CH)

(‘From 6 samples isolated using MPN method, whereby bacteria is grown in mEC broth, 18 colonies are obtained which will be detected their fliCH7 gene using PCR method’)

In cases where two boosters were simultaneously used in juxtaposition with one another within the same proposition as in sentence [14] below, both of them were counted as two different boosters, rather than as a single one.

[14] We have described details of the genesis and characterization of such catalysts, formed in situ from Rh6(CO)16, and Mo(CO)6, and unequivocally demonstrated that they are in fact heterogeneous. (CH)

The present study was aimed at exploring to what extent English and Indonesian research articles were different in terms of degree of certainty in the proposition being presented. Thus, the use of the manner adverb unequivocally in [14] above can be said to add more illocutionary force (i.e. stronger degree of certainty) to the proposition being presented (they are in fact heterogeneous). The same methodological practice was also implemented in the case whereby a booster and a hedge were used side by side in the same proposition, as in [15] below.

[15] The findings of the present study strongly suggest that there are a number of identifiable patterns and that some parts of words are processed more readily than others. (AL)
The use of the adjectival phrase *strongly suggest* in [15] above might send the message that the author is cautious while at the same time assertive, which might sound impossible. However, this is not the most accurate reading of the sentence [15] above. Without the adverb *strongly*, the author clearly sounds more cautious as indicated by the use of the verb *suggest*. Through using such adverb, the authors tries to increase the degree of certainty in the proposition being stated, although they do not feel completely confident in such proposition.

Following the practice of identification of hedges in relation to their use in quoted materials (both citation and the data being analyzed), boosters were also ignored in such text locations. The reason for this practice was exactly the same as that mentioned above regarding the use of hedges. Therefore, the boosters in sentence [16] were not included in the analysis.

[16] *Hal ini diperkuat pula dengan pandangan Humbolt (dalam Cassirier, 1987: 183-184) yang mengatakan bahwa perbedaan nyata antarbahasa bukan sekedar perbedaan bunyi atau perbedaan tanda, tetapi perbedaan antarbahasa sesungguhnya berkenaan dengan perbedaan perspektif dunia, sebagaimana tercermin dalam symbol-simbol.* (AL)

(‘This is also confirmed by Humbolt’s view (in Cassirier, 1987: 183-184) which states that *obvious* differences among languages are not only differences in sounds and signs, but differences among languages *actually* are concerned with differences in world view, as reflected in symbols’)

It is very clear from the above sentence that the writer merely reports what the quoted author’s statement (in this case, Humbolt).
4.4.4 Identification of Grammatical Forms

The notion “grammatical forms” in the present study referred to grammatical classes of words or parts of speech, such as noun, verb, adjective, adverb (see Downing & Locke, 2006, p. 16). The determination of the grammatical form (sometimes called in the present study linguistic realization) of a particular hedge or booster in the present study was based on the linguistic context in which it was being used. That is, emphasis was placed on the grammatical function served by such linguistic device in a particular context, rather than its formal properties. Therefore, the hedge in general in the sentence African Americans do less well, in general, on all assessment types … was categorized as an adverb due to the grammatical function it serves in this particular context, where it modifies the entire proposition (African Americans do less well on all assessment types), despite the fact that it takes the form of a prepositional phrase. It is also true of the grammatical form of the booster in fact, which was categorized as an adverb. It is to be borne in mind that this methodological practice is not at all new. Biber (2006), in his analysis of stance markers, included such phrases as in fact, of course, no doubt into the category of adverb. It is to be noted that the grammatical form of a linguistic feature was not determined solely in terms of the grammatical slot which the feature can occupy. The meaning of the feature was also taken into consideration in this case. Finally, it is worth mentioning that the identification of the grammatical forms of hedges and boosters in the English articles was carefully carried out with the help of The New Oxford American Dictionary (Jewell, Abate, & McKean, 2005), while the identification of grammatical forms of hedges and boosters in the Indonesian articles was conducted by consulting the online Indonesian dictionary (see http://bahasa.kemdiknas.go.id/kbbi/index.php). Each of
these dictionaries is monolingual dictionary, and can be considered to be the most comprehensive and authoritative dictionary in each language. In addition, grammar references were consulted in this stage of the analysis: *Longman Grammar of Spoken and Written English* (Biber, Johansson, Leech, Conrad, & Finegan, 1999) for English and *Indonesian: A Comprehensive Grammar* (Sneddon, 1996) for Indonesian.

It is true that a single linguistic device can be polysyntactic (i.e. it can fulfill more than one grammatical function). If we look up the stem *biasa* in the Indonesian dictionary, for example, we will be presented with the information that the stem can be used as an adjective (*biasa* ‘usual’), a verb (*membiasakan* ‘make accustomed to’) or noun (*kebiasaan* ‘habit’), and adverb (*biasa/nya* ‘usually’). The procedure adopted in the present study was to examine which of the contexts (associated with the grammatical forms of the stem just mentioned) presented in the dictionary was exactly the same as the context used in the sentence found in the research article. By doing so, it was possible to determine the grammatical form of the linguistic feature. In the sentence *Dalam perspektif fungsional, ungkapan tradisional itu biasa digunakan dalam realitas kehidupan GTM …* (‘In functional perspective, such traditional idioms usually are used in life reality of GTM …’), for example, the hedge *biasa* is here being used as an adverb (see [http://bahasa.kemdiknas.go.id/kbbi/index.php](http://bahasa.kemdiknas.go.id/kbbi/index.php)): “menurut apa yg sudah dilazimkan; lazimnya” (‘according to what has been conventionalized’; ‘prevalently’). So if we paraphrase the above sentence, it could read like this: ‘In functional perspective, such traditional idioms are used according to what has been conventionalized, that is, used in life reality of GTM …’
It should be emphasized here that the analysis of hedges and boosters in each language in terms of their grammatical forms was conducted independently. That is to say, the analysis of Indonesian and English hedges and boosters was entirely based on the Indonesian and English linguistic system, respectively. No effort was made to apply the linguistic working of one language into the analysis in another language. This is why the Indonesian booster *terlihat* was categorized as a verb, although the English translation is *obvious*, which is an adjective.

### 4.5 Data Analysis

As could easily be expected, the length of the research articles (measured in words), across disciplines and languages, was not the same. Biber (2009, p. 1299) is right when he mentioned that when examining the counts of features across texts “it is important to make sure that the scores are comparable.” For this reason alone, the analysis was conducted on the normalized, rather than absolute or raw, occurrences of the voice features (i.e. hedges and boosters). Normalization of counts refers to “a way to convert raw counts into rates of occurrence, so that the scores from texts of different lengths can be compared” (Biber, 2009, p. 1299). The counts of the hedges and boosters in the present study were normed to a basis per 1,000 words of text. The major reason for using 1,000 words as the basis was that Indonesian articles were much shorter than English ones in both disciplines (see section 4.2.2). Therefore, adopting a higher basis, for example 10,000 words, would result in artificial inflation of rare features, more particularly in the Indonesian texts (see Biber, 2009). The normalization of the occurrences of the two linguistic devices in a text was done using the following formula:
For example, if 89 hedges were found in a text of 7,503 words the normalized frequency of the device in the text in question was 11.86 (rounded up to two decimals).

To reiterate, there were four research questions in the present study. All research questions were concerned with comparison between two groups of scores. According to Larsen-Hall (2010), there are two different statistical tests which can be used to compare two groups of scores. These are t-test (which is a parametric test) and Mann-Whitney U test (which is a non-parametric test). The choice of one test over the other in the present study was determined by the characteristics of the data: whether or not (1) the data are interval (i.e. continuous), (2) the data are independent (i.e. the data do not influence each other), (3) they are normally distributed, and (4) the two groups compared have equal variances (Larson-Hall, 2010, p. 250). The parametric type of the test (i.e. t-test) is used when all these assumptions are met. Violation of even one of these assumptions should lead to the use of the non-parametric type (i.e. Mann-Whitney U test). The statistical analysis was carried out with the help of SPSS (Statistical Package for Social Sciences) version 20. To determine the magnitude of difference (if there was any significant difference) between any two group (e.g. English chemists vs. Indonesian chemists), effect size was also calculated. Following Field (2009, p. 550), the following equation was used to manually compute the effect size estimate for Mann-Whitney U test:

\[
r = \frac{Z}{\sqrt{N}}
\]
Notes:

\( r = \) effect size estimate

\( Z = \) z-score obtained from the SPSS output, and

\( N = \) the size of the total sample involved.

For \( t \)-test, the following formula was used to compute the effect size (Field, 2009, p. 332):

\[
r = \sqrt{\frac{t^2}{t^2 + df}}\]

Notes:

\( r = \) effect size estimate

\( t = \) \( t \) statistic obtained from the SPSS output

\( df = \) degrees of freedom
Chapter 5 Hedging and Boosting in Research Articles

5.1 Introduction

This chapter presents the findings of the present dissertation study. As has been mentioned earlier in the introduction, the major purpose of the study was to determine whether sociocultural context in which the articles were produced or discipline (or both) influenced the rhetorical structure of research articles, whereby rhetorical structure was operationally defined as the use of two interpersonal markers (hedges and boosters). To accomplish this purpose, two groups of scholars from the disciplines of chemistry and applied linguistics writing in two different languages (Indonesian and English) were compared their use of the two interpersonal markers. The findings of holistic comparison (i.e. scholars from the two disciplines within one language are collapsed into one group) are presented in the following section (Section 5.2). Sections 5.3 and 5.4 report on the findings from the comparison between the two groups of applied linguistics scholars (Indonesian vs. English) and between the two groups of chemistry, respectively. The data produced from the within-language comparison (e.g. between the two groups of Indonesian scholars) is presented in the subsequent section. The final section is dedicated to the presentation of findings in regard to the linguistic devices used by the two groups of scholars to realize the interpersonal markers in their research articles. It is to be noted that in this chapter no discussion of the findings is provided, since such discussion is presented in the following chapter.
5.2 Hedges and Boosters in English and Indonesian Research Articles

This section deals with the question of whether English and Indonesian scholars (from applied linguistics and chemistry) used the two interpersonal features of focus in the present study (hedges and boosters) in their research articles at different or similar frequency rates. The quantitative analysis of the data for this research question revealed that the pattern of use of hedges and boosters in the entire English corpus (both fields combined) was different from that found in the Indonesian corpus (both fields combined). The following figure shows the total number of the two interpersonal features found in the two corpora. It is to be reiterated at this point (see section 4.2.2 in the previous chapter) that the size of the English corpus was 268,200 words, whereas the size of the Indonesian corpus was 139,648 words.

![Figure 5.1] Total numbers of hedges and boosters in both corpora

The total number of the two interpersonal features found in the English entire corpus was 3,775. Henceforth, when the phrase *entire corpus* is used it refers to a combined corpus composed of the two disciplines in each language. On average, therefore, a research
article (regardless of the field to which it belongs) in this entire corpus contained 72.60 features (hedges and boosters combined). Recall that such corpus consisted of 52 research articles from the two fields (applied linguistics and chemistry). Separating hedges from boosters the analysis showed that 50.08 hedges and 22.52 boosters were contained in each of the research articles in the entire English corpus. With the total of 1,817 features (hedges and boosters combined) identified in the entire Indonesian corpus, a single research article contained 34.94 features or 12.69 hedges and 22.25 boosters, on average.

The obvious fundamental difference between the two corpora, as the Figure 5.1 above immediately shows, was that while the number of hedges in the Indonesian corpus was obviously smaller than boosters, the former feature in the English corpus was more frequent than the latter. The proportions of hedges and boosters to the total interpersonal features identified in the entire English corpus were 68.98% and 31.02%, respectively. Quite similar proportions could also be observed in the entire Indonesian corpus, except that the pattern was reversed: hedges, 36.32% and boosters, 63.68%. It should be borne in mind that the figures shown in the chart above are the raw numbers of hedges and boosters found in the two major corpora. As such, the information presented in the figure above could not be used as the basis of comparison between the two corpora, given the fact that the two corpora were not similar in size. In other words, the above mentioned information provides no significant information regarding whether or not the research articles from the two disciplines written in the two languages were similar or different in terms of their usage of hedges and boosters. The following are examples of the use of hedges and boosters in both languages.
A study of this nature may not only contribute to the interactive theories of reading and further refinement of models of lexical development through reading, but also help to explain the variability found in vocabulary learning outcomes through reading within instructed L2 learning environments (AL).

There are the obvious safety concerns of handling poisonous gas such as carbon monoxide … (CH)

Mitos AMP tampaknya cenderung lair dari kawula alit yang berkembang dari mulut ke mulut (AL)

(‘AMP myth seems likely to be born from low status people which develops from mouth to mouth.’)

... baik kandungan logam Pb maupun Cu mengalami penurunan sebanding dengan kenaikan kedalaman sedimen di masing-masing lokasi (perbedaannya sangat nyata). (CH)

(‘… the substance of both metal Pb and Cu decreases comparable with the increase in the depth of sediment in each location (the difference is very significant’)

The descriptive statistics for the data for research question 1 are shown in the following table. The figures presented in the table are the normed rates of use of hedges and boosters in the two entire corpora analyzed in the present study.
Table 5.1 Hedges and boosters in English and Indonesian corpora (per 1,000 words)

<table>
<thead>
<tr>
<th>Language</th>
<th>Feature</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>Hedges</td>
<td>52</td>
<td>3.38</td>
<td>27.76</td>
<td>9.25</td>
<td>4.14</td>
</tr>
<tr>
<td></td>
<td>Boosters</td>
<td>52</td>
<td>0.42</td>
<td>7.86</td>
<td>3.24</td>
<td>1.67</td>
</tr>
<tr>
<td>Indonesian</td>
<td>Hedges</td>
<td>52</td>
<td>0.00</td>
<td>18.50</td>
<td>5.46</td>
<td>4.07</td>
</tr>
<tr>
<td></td>
<td>Boosters</td>
<td>52</td>
<td>0.69</td>
<td>21.11</td>
<td>7.37</td>
<td>4.68</td>
</tr>
</tbody>
</table>

As is obvious from Table 5.1 above, the mean number of hedges in the entire English corpus was larger than that found the Indonesian corpus. A considerable difference of 3.79 features per 1,000 words existed between the two entire corpora. The reverse pattern was apparent in the mean use of boosters for the two entire corpora. This time the Indonesian entire corpus contained more of the feature than the entire English corpus, 7.37 versus 3.24 per 1,000 words. Compared to the mean difference for hedge use, the mean difference for booster use was larger (i.e. 4.13 features per 1,000 words). The table above also shows that not all research articles included in the two corpora contained hedges, as indicated by the Minimum column. There was only one article from the Indonesian chemistry corpus within which no single hedging marker was present. The figures shown in the Maximum column, except for the Indonesian booster, were extreme data values or what is in statistics commonly called outliers; these were the data values which were remarkably distant from the respective mean. The table above shows that the dispersion or variability of the scores for hedges was comparable between the two languages as indicated by the magnitude of the standard deviation (English, 4.14 and Indonesian, 4.07). According to Healey (2013, Chapter 4), the larger the value of the standard deviation, the more dispersed the data, or vice versa. The average deviation from
the mean frequency of usage of hedges in the two languages (as far as the two disciplines are concerned) was comparable. For boosters, however, Indonesian research articles were more dispersed than English ones, as indicated by the larger size of standard deviation for the former.

The next stage in the analysis of the data for research question 1 (whose summary is shown in Table 5.1 above) was to see whether the difference observed in the rate of hedges and boosters found in the two corpora was indeed statistically significant. But before such analysis was conducted a test was carried out to examine the characteristics (i.e. distribution) of the data. This was done to determine whether the parametric test (independent samples t-test) or non-parametric test (Mann-Whitney U test) for comparing two groups was to be employed. More specifically, the formal test of normality of distribution was conducted. To what extent the data sets used to answer research question 1 were normally distributed was tested using the Kolmogorov-Smirnov normality test. This test is a formal test of the null hypothesis that “the sampling distribution comes from the same distribution as the normal distribution, [and that] if the \( p \)-value … is less than .05 you would reject the null hypothesis and accept the alternative hypothesis that the data are not normally distributed” (Larson-Hall, 2010, p. 84). The results of the test were that only two of the four data sets were indeed normally distributed. These were English booster, \( D = 0.09, n = 52, p > 0.05 \), and Indonesian booster, \( D = 0.11, n = 52, p > 0.05 \). By contrast, the English hedge and Indonesian hedge data sets were not normally distributed: English hedge, \( D = 0.14, n = 52, p < 0.05 \); Indonesian hedge, \( D = 0.18, n = 52, p < 0.05 \).
On the basis of the results of the formal test of normality reported above, it was decided that the entire data for the research question 1 was analyzed using the non-parametric test for comparing two independent groups, namely Mann-Whitney $U$ test. The results of the Mann-Whitney $U$ test conducted revealed that the mean for the English hedge data was significantly different from the mean for the Indonesian hedge data, Mann-Whitney $U = 578.50$, $n_1 = n_2 = 52$, $p < 0.05$, $r = -0.49$. This means that English scholars from the fields of applied linguistics and chemistry (at least those whose research articles were included in the corpus for the present study) used hedges significantly more frequently than the Indonesian scholars from the same fields (English mean rank = 67.38 and Indonesian mean rank = 37.62; see also Table 5.1 above). The magnitude of the effect size ($r = -0.49$) suggests that the variable language (i.e. sociocultural context) had marginally large effect on the use of hedges in research articles, which indicates that the sociocultural context factor was not a major factor influencing the use of hedges in both languages.

Similarly, the mean for the English booster data was significantly different from the mean for the Indonesian booster data, Mann-Whitney $U = 2,116.00$, $n_1 = n_2 = 52$, $p < 0.05$, $r = 0.49$. This means that the Indonesian scholars (from both fields) used boosters in their research articles significantly more frequently than the English scholars (Indonesian mean rank = 67.19 and English mean rank = 37.81; see also Table 5.1 above). The same magnitude of effect of sociocultural context on the use of boosters was also observed ($r = 0.49$).
5.3 Hedges and Boosters in Applied Linguistics Research Articles

Whether English scholars from the field of applied linguistics used hedges and boosters at a different frequency rate from Indonesian scholars from the same field was the second research question of the present study. A total of 2,482 interpersonal features (hedges and boosters combined) were present in the English applied linguistics corpus. Out of this total number, 1,808 were hedges which accounted for almost three quarters (72.84%) of the total features identified. The category of boosters in this corpus, therefore, accounted for over one quarter (27.16%) only, 674 markers to be accurate. As such, since the corpus was composed of 26 articles, on average a single English applied linguistics research article contained 95.46 devices (hedges and boosters combined). On average, hedges and boosters were used in a single article by English applied linguists 69.54 and 25.92 times, respectively. An example of hedging and boosting use in English applied linguistics research articles follows.

[21] One possible explanation of this finding is that words with more syllables have more word fragments available to be learned ... 

[22] Answers to this question clearly focus the analysis on the content of the story ...

A different picture emerged in the Indonesian applied linguistics corpus. Compared to the English corpus, the corresponding Indonesian corpus contained lower number of the interpersonal features under study. In total, 1,424 features (hedges and boosters combined) were used in the Indonesian applied linguistics corpus. Unlike the English corpus described above, the figure for boosters was much higher than that for hedges in the Indonesian corpus. A total of 429 hedges were used in the corpus, which
was extremely lower than the total boosters found (995). On average, a single article in the Indonesian applied linguistics corpus contained 54.77 devices (hedges and boosters combined). This number accounted for 58% of the number of devices (hedges and boosters combined) found in the English corpus mentioned above. The following are sample sentences with a hedge and a booster found in the Indonesian applied linguistics corpus.

[23]  
*Bagi masyarakat DN di Kalimantan Tengah (KT), legenda, yang merupakan bagian dari cerita rakyat dan biasanya menceritakan tentang asal muasal suatu tempat, sangat akrab dengan kehidupan keseharian karena legenda merupakan bagian dari tuturan ritual sebagaimana yang dimuat dalam Penaturan (Kitab Suci agama Hindu Kaharingan)*  
(‘For DN society in Central Kalimantan (KT), legend, which is part folklore and usually tells a story about the origin of a place, is very familiar to daily life because legend is part of ritual speech as stated in Penaturan (Holy Book of Kaharingan Hindu’)

[24]  
*… membaca buku untuk anak sangat berguna pada saat anak mulai dapat memusatkan perhatian untuk jangka waktu yang pendek …*  
(‘… reading books for children is very important when children begin to be able to focus their attention for a short period of time …’)

The difference in the total devices found in the two corpora (English and Indonesian applied linguistics corpora) can be explained in terms of the differing lengths of articles in both corpora. Although not always necessarily the case, it is reasonable to argue that the longer the text the greater the chances that it contains such interpersonal features at a
greater frequency rate. In the Indonesian applied linguistics corpus, on average a single research article contained 16.50 hedges and 38.27 boosters. Thus, the average difference between the number of hedges and boosters found in a single article was relatively large, where boosters were clearly dominant over hedges. The information presented above is graphically presented in the following figure.

**Figure 5.2** Total numbers of hedges and boosters in the applied linguistics corpora

Per 1,000 words, the minimum number of hedges used in the English applied linguistics corpus was 4.22, which was higher than the minimum number of hedges used in the Indonesian applied linguistics, 1.03. Therefore, it is clear that all articles in the two corpora contained hedges. With regard to boosters, the minimum usage was higher in the Indonesian corpus. Whereas in the Indonesian corpus 1.59 devices per 1,000 words constituted the minimum usage, in the English applied linguistics corpus it was 1.20 devices per 1,000 words which was the minimum rate of usage. A similar picture also emerged in the maximum usage of the two interpersonal features in both corpora (applied linguistics in the two languages). The maximum number of hedges found in the English
corpus was 27.76, more than nine devices higher than the maximum number of hedges observed in the Indonesian corpus (18.50). The maximum number of hedges found in the English applied linguistics turned out to be an extreme value or outlier. It was also true of the maximum number of hedges found in the Indonesian corpus. However, when it came to the maximum number of boosters found in the two corpora, the opposite was the case. This time the difference was even larger (14.25 devices per 1,000 words). While 6.86 was the maximum number of boosters identified in the English applied linguistics corpus (which turned out to be an outlier), 21.11 was the maximum number of boosters which can be found in the corresponding Indonesian corpus.

The mean number of hedges used in a 1,000-word text in the English applied linguistics corpus was 10.20 and the standard deviation was 4.69, whereas in the corresponding Indonesian corpus the mean number was 4.43 and the standard deviation was 3.69. On the face of it, it seemed that the English applied linguistics scholars used more hedges in their articles. As indicated by the standard deviations, the two data sets for hedges in both corpora were not equal in terms of their dispersion. This was evident from the larger size of the standard deviation for the Indonesian hedges data. While the mean number of hedges per 1,000 words in the English corpus was higher than the mean number found in the Indonesian corpus, the mean number of boosters per 1,000 words in the latter corpus was higher than the mean number found in the former corpus. The difference in the mean numbers of boosters was similar to the difference found in the mean numbers for hedges in the two corpora. The mean number of boosters per 1,000 words found in the Indonesian corpus was more than twice as large as the mean number of boosters found in the English corpus. For boosters in the Indonesian corpus, the mean
number was 9.54 per 1,000 words, and for the English corpus it was only 3.78. The
standard deviations of the data for boosters in English and Indonesian corpora were 1.47
and 4.75, respectively. The magnitudes of these standard deviations suggested that the
data values for English boosters were slightly more concentrated around the mean
compared to the data values for Indonesian boosters. This in turn suggested that the
English writers were slightly more uniform in terms of frequency of usage of boosters in
their articles. The descriptive statistics of the usage of the interpersonal features in the
two corpora described in this paragraph is summarized in the following table.

Table 5.2 Descriptive statistics for the applied linguistics corpora (per 1,000 words)

<table>
<thead>
<tr>
<th>Language</th>
<th>Feature</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>Hedges</td>
<td>26</td>
<td>4.22</td>
<td>27.26</td>
<td>10.20</td>
<td>4.69</td>
</tr>
<tr>
<td></td>
<td>Boosters</td>
<td>26</td>
<td>1.20</td>
<td>6.86</td>
<td>3.78</td>
<td>1.47</td>
</tr>
<tr>
<td>Indonesian</td>
<td>Hedges</td>
<td>26</td>
<td>1.03</td>
<td>18.50</td>
<td>4.43</td>
<td>3.69</td>
</tr>
<tr>
<td></td>
<td>Boosters</td>
<td>26</td>
<td>1.59</td>
<td>21.11</td>
<td>9.54</td>
<td>4.76</td>
</tr>
</tbody>
</table>

Like the other pairs of data mentioned before, these pairs of data were also
subjected to test of normality of distribution. Like the other sets of data previously
described, these data sets were also tested by using a formal test of normality
(Kolmogorov-Smirnov). The test indicated that while the data for the English and
Indonesian boosters came from a population with normal distribution, the data for
English and Indonesian hedges did not, English boosters (D = 0.11, n = 26, p > 0.05),
Indonesian boosters (D = 0.11, n = 26, p > 0.05), English hedges (D = 0.22, n = 26, p <
0.05), and Indonesian hedges (D = 0.26, n = 26, p < 0.05).
Since the data sets for research question 3 which were normally distributed form the majority group, the data were analyzed using the non-parametric version of the test used to compare two groups, namely Mann-Whitney $U$ test. The results of the statistical test revealed that the mean for the English hedges was significantly different from the mean of the Indonesian hedges (Mann-Whitney $U = 68.00$, $n1 = n2 = 26$, $p < 0.05$, $r = -0.69$). This result strongly indicated that the English scholars from applied linguistics used hedges significantly more frequently in their articles than the Indonesian scholars from the same field (English mean rank = 36.88 and Indonesian mean rank = 16.12; see Table 5.3 above). The magnitude of the effect size suggested that the difference between the two means are large ($r = -0.69$), which can be translated as suggesting a large effect of the variable language on the use of hedges in the field of applied linguistics. Likewise, significant difference was also evident between the mean for the English boosters and the mean for the Indonesian boosters (Mann-Whitney $U = 604.00$, $n1 = n2 = 26$, $p < 0.05$, $r = 0.68$), indicating that the Indonesian scholars from applied linguistics did indeed use boosters in their articles significantly more frequently than the English scholars from the same field (Indonesian mean rank = 36.73 and English mean rank = 16.27; see Table 5.3 above). Similar large effect was also evident here, suggesting that the variable sociocultural context exerted substantive effect on the use of boosters by the two groups of scholars.

5.4 Hedges and Boosters in Chemistry Research Articles

Research question 3 was concerned with whether English and Indonesian scholars from the field of chemistry used hedges and boosters at different frequency rates from each other. To answer this question, the two interpersonal features (hedges and boosters)
were quantified independently from the two corpora (i.e. English chemistry corpus and Indonesian chemistry corpus). The total number of hedges and boosters identified in the chemistry corpora (English and Indonesian) is shown by the Figure 5.2 below. The general patterns in the two corpora were the same. In both corpora hedges were dominant over boosters. The difference in the frequency of use of the two interpersonal features in the English corpus was apparently much larger than that in the Indonesian corpus.

Collectively, English chemistry scholars used hedges 796 times (78% of the total features used) and boosters 497 times (22% of the total features used) in 26 articles of 90,878 words length. On average, an English scholar used 30.62 hedges and 19.12 boosters in a single article. Therefore, this group of scholars used hedges more frequently than boosters by 299 times in the corpus or by 11.50 times in a single article. The total number of interpersonal features in the Indonesian chemistry corpus was 392. Indonesian chemistry scholars used hedges more frequently than boosters by 70 times in 26 research articles of 34,402 words length: while hedges were used 231 times (59% of the total features observed), boosters were used 161 times (41% of the total features observed) within the corpus. On average, the Indonesian scholars used 8.88 hedges and 6.19 boosters in a single article. Therefore, in a single article the Indonesian chemistry scholars used hedges more frequently than boosters by 2.69 times.

The above observation cannot readily be taken to mean that the English writers indeed used hedges and boosters more frequently than the Indonesian writers. Compared to the English scholars, Indonesian scholars used the two interpersonal features more or less evenly in their articles. Recall that the figures reported thus far were raw figures, rather than normed ones. The differential lengths of the research articles included in the
two corpora exerted a significant influence on the raw figures. Moreover, the large difference in the use of the two interpersonal resources between the two groups of chemistry scholars was obviously due to the difference in the size of the corpora, that is, 90,878 for the English corpus compared to only 34,402 words for the Indonesian corpus. Therefore, it is not possible to say at this point that the English chemistry writers indeed used more hedges and boosters in their articles. The following are examples of the usage of hedges and boosters in chemistry research articles in both languages.

[25] Both the stoichiometry and stability of such products are likely to be dictated by the nature of the individual amide ...

[26] These are clearly unsuitable for the production of intermediates in the manufacture of, for example, pharmaceuticals ...

[27] Berdasarkan kaidah kemotaksonomi bahwa tumbuhan dari genus atau family yang sama kemungkinan mengandung senyawa dengan kerangka struktur yang mirip ...

(‘Based on the principles of chemotaxonomy, plants from the same genus or family perhaps contain chemical compound with similar structure …’)

[28] Di sisi lain, air mudah sekali terkontaminasi oleh bahan-bahan pencemar ...

(‘On the other hand, water is extremely easy to be contaminated by pollutants …’)

The raw data mentioned above were then transformed into normed data. Table 5.2 below shows the descriptive statistics of the hedges and boosters found in the corpora of chemistry in both languages.
Figure 5.3 Total numbers of hedges and boosters in the chemistry corpora

Table 5.3 Descriptive statistics for the chemistry corpora (per 1,000 words)

<table>
<thead>
<tr>
<th>Language</th>
<th>Feature</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>Hedges</td>
<td>26</td>
<td>3.28</td>
<td>14.93</td>
<td>8.31</td>
<td>3.32</td>
</tr>
<tr>
<td>English</td>
<td>Boosters</td>
<td>26</td>
<td>0.42</td>
<td>7.86</td>
<td>2.70</td>
<td>1.70</td>
</tr>
<tr>
<td>Indonesian</td>
<td>Hedges</td>
<td>26</td>
<td>0.00</td>
<td>18.26</td>
<td>6.48</td>
<td>4.24</td>
</tr>
<tr>
<td>Indonesian</td>
<td>Boosters</td>
<td>26</td>
<td>0.69</td>
<td>15.72</td>
<td>5.20</td>
<td>3.50</td>
</tr>
</tbody>
</table>

As has been mentioned above, there was one article from the Indonesian chemistry corpus which did not use any hedge at all. For the English corpus, all articles contained hedges. Two of the four data values shown in the Maximum column in the table above (English booster and Indonesian hedge) were outliers. Per 1,000 words, on average 8.31 hedges were present in the English corpus. This figure was nearly twice as many as that found in the Indonesian corpus (i.e. 4.43 devices per 1,000 words). The pattern was reversed when it came to the deployment of boosters by the two groups of scholars. The Indonesian scholars used boosters nearly twice as frequently as the English scholars: 5.20
devices versus 2.70 devices per 1,000 words, respectively. In terms of the concentration of the data points for both features in both corpora, as indicated by the magnitude of the standard deviation, the Indonesian data sets were more dispersed than the English ones. This indicates that English scholars were more uniform in terms of the frequency of use of the two features in their articles, compared to their Indonesian counterparts.

To see whether the differences in the normed frequency of use of the two interpersonal features shown in Table 5.2 above were indeed statistically significant, those figures were subjected to a statistical analysis used to compare two groups. As mentioned before, without knowledge of the characteristics of the data in question it was not possible to determine which statistical analysis was to choose, whether the parametric version or non-parametric one. Therefore, the next stage of the analysis was to find out such data characteristics (i.e. whether the data were normally distributed).

The results of normality test using Kolmogorov-Smirnov test showed that all the four data sets met the normality of distribution assumption: English hedges ($D = 0.14, n = 26, p > 0.05$), English boosters ($D = 0.15, n = 26, p > 0.05$), Indonesian hedges ($D = 0.13, n = 26, p > 0.05$), and Indonesian boosters ($D = 0.11, n = 26, p > 0.05$). Recall that when the significance level is larger than the specified level (0.05) it can be assumed that the data set comes from normal distribution, that is each data set comes from the its larger population.

Since the data sets used to answer research question 2 all passed the test of normality of distribution, the parametric version of the test for comparing two groups were employed, namely independent samples t-test. The results of the test were that there was no significant difference between the mean usage of hedges by the English scholars
(M = 8.31, SD = 3.32) and the mean usage of hedges by the Indonesian scholars (M = 6.48, SD = 4.24), \( t (50) = 1.726, p > 0.05 \). This suggests that English and Indonesian chemistry scholars used hedges at comparable rates in their research articles. For boosters, by contrast, it was evident that the usage by the English scholars (M = 2.70, SD = 1.70) and the usage by the Indonesian scholars (M = 5.20, SD = 3.50) were statistically significantly different from each other, \( t (36.19) = -3.27, p < 0.05, r = 0.48 \). This indicates that Indonesian scholars were more prone to use boosters in their articles than their disciplinary colleagues writing in English. The magnitude of the difference between the two groups of scholars in terms of their use of boosters was marginally large. In other words, it could be argued that the variable sociocultural context did play a relatively large role in the use of boosters by the two groups of scholars.

### 5.5 Disciplinary Usage of Hedges and Boosters

This section explores the extent to which research articles from the two different fields (applied linguistics and chemistry) from the same language were similar to or different from each other in terms of the presence of hedges and boosters. This question was also used to further test the effect of language on research article writing, more particularly usage of hedges and boosters in research article writing. For example, the same rhetorical pattern (in regard to frequency of use of the two interpersonal features under study) observed across the two fields within the same language would indicate that it was indeed language which has some influence on textual characteristics of research articles. Otherwise, no such claim could be made.
The following figure shows the total numbers of hedges and boosters identified in the English corpus.

![Figure 5.4 Total numbers of hedges and boosters in the English corpora](chart)

As can be seen from the above figure, a common pattern across the two fields was immediately apparent. In both fields, hedges were more frequent than boosters. However, the two fields were different in terms of proportions of the two features. Hedges in the applied linguistics articles were more frequent than in the chemistry articles: applied linguistics, 73% vs. chemistry, 62%. In chemistry, by contrast, boosters were used more frequently than in applied linguistics: chemistry, 38% vs. applied linguistics, 27%. It is to be noted that the figures presented in the above chart were raw figures, rather than normed ones. As a consequence, they do not inform us whether the two sets of English research articles were indeed different from each other in regard to the frequency of use of the two features. This was because the lengths of the articles in both English corpora (chemistry and applied linguistics) were not comparable. The following table displays the normed rates of use of the two features in both fields within the English language.
Table 5.4 Descriptive statistics for the English corpora (per 1,000 words)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Field</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hedges</td>
<td>Chemistry</td>
<td>26</td>
<td>3.28</td>
<td>14.93</td>
<td>8.31</td>
<td>3.32</td>
</tr>
<tr>
<td></td>
<td>App. Ling</td>
<td>26</td>
<td>4.22</td>
<td>27.26</td>
<td>10.20</td>
<td>4.69</td>
</tr>
<tr>
<td>Boosters</td>
<td>Chemistry</td>
<td>26</td>
<td>0.42</td>
<td>7.86</td>
<td>2.70</td>
<td>1.70</td>
</tr>
<tr>
<td></td>
<td>App. Ling</td>
<td>26</td>
<td>1.59</td>
<td>21.11</td>
<td>3.78</td>
<td>4.76</td>
</tr>
</tbody>
</table>

The mean numbers of hedges and boosters identified in the field of chemistry were consistently smaller than those observed in the applied linguistics field. However, the differences between the two fields in the rate of use of the two features were not large.

Earlier, it has been pointed out that the data for hedges and boosters from the field of chemistry were more or less normally distributed, as indicated by the results of the formal test of normality. It has also been mentioned that one of the data sets from the field of applied linguistics (data for hedges) did not pass the normality test, or in other words, it was not normally distributed. Despite the nature of the distribution of this hedge data set, since the majority of the data sets for the research question addressed in the present section displayed normal distribution, it was decided that the parametric version of the test used to compare two means (independent samples t-test) was deployed. The results of the test were the following: the mean rate of use of hedges in the English applied linguistics field (M = 10.20, SD = 4.69) was not significantly different from that in the English chemistry field (M = 8.31, SD = 3.32), $t(50) = 1.68, p > 0.05$. This means that both groups of English scholars used hedges in their research articles at comparable rates, which is paramount to saying that the variable discipline did not have any effect on the use of hedges. On the other hand, there was a significant difference between the two
fields in terms of use of boosters (applied linguistics, M = 3.78, SD = 1.47; chemistry, M = 2.70, SD = 1.70), t (50) = 2.46, p < 0.05, r = 0.33. This latter finding can be translated as follows: English applied linguists tended to use boosters in their articles more frequently than their colleagues working within the field of chemistry, and the magnitude of the difference between the two groups of English scholars was medium (r = 0.33), which in turn indicates that it was not the discipline to which they belong which largely determined their rate of use of boosters.

Now we turn our attention to the Indonesian data. The total numbers of hedges and boosters used in the two Indonesian corpora (chemistry and applied linguistics) are presented graphically in the following chart.

![Figure 5.5 Total numbers of hedges and boosters in the Indonesian corpora](image)

As can be seen from the above chart, the patterns of use of the two features in the two Indonesian corpora were different. Hedges and boosters were used in the field of chemistry more or less comparably frequently (hedges, 59% vs. boosters 41%). In the other field (applied linguistics), boosters were used much more frequently than hedges,
70% and 30%, respectively. As has been reported earlier, the size of the applied linguistics corpus in Indonesian was much larger than the size of the corresponding chemistry corpus. Therefore, the above chart does not tell us the actual difference, if any, between the two sets of articles written in Indonesian. The actual difference or similarity between the two Indonesian corpora can only be determined by converting the raw figures presented in the above chart into normed figures which are presented in the following table.

Table 5.5 Descriptive statistics for the Indonesian corpora (per 1,000 words)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Field</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hedges</td>
<td>Chemistry</td>
<td>26</td>
<td>0.00</td>
<td>18.26</td>
<td>6.48</td>
<td>4.24</td>
</tr>
<tr>
<td></td>
<td>App. Ling</td>
<td>26</td>
<td>1.03</td>
<td>18.50</td>
<td>4.43</td>
<td>3.69</td>
</tr>
<tr>
<td>Boosters</td>
<td>Chemistry</td>
<td>26</td>
<td>0.69</td>
<td>15.72</td>
<td>5.20</td>
<td>3.50</td>
</tr>
<tr>
<td></td>
<td>App. Ling</td>
<td>26</td>
<td>1.59</td>
<td>21.11</td>
<td>9.54</td>
<td>4.76</td>
</tr>
</tbody>
</table>

The above table immediately shows that on average an Indonesian chemistry article contained slightly more hedges than applied linguistics article. On the other hand, an applied linguistics article contained almost twice as many boosters as a chemistry article.

The characteristics (i.e. the nature of the distribution) of the four sets of data presented in the above table have been reported earlier. It was mentioned that the data sets from the field of chemistry (written in Indonesian) met the normality distribution assumption. The data sets from the other field (applied linguistics), however, were not normally distributed. Since the data sets which were normally distributed did not form the majority group, it was decided that the non-parametric version of statistical test used to compare two groups was used. One of the findings was that there was significant
difference between the Indonesian chemistry scholars and their colleagues from applied linguistics in terms of their use of hedges in their articles, Mann-Whitney $U = 446.50$, $n_1 = n_2 = 26$, $p < 0.05$, $r = 0.28$, which indicates that the two groups of Indonesian scholars used hedges at different rates in their articles (applied linguistics mean rank 22.33 and chemistry mean rank 30.67, see also Table 5.5 above). Hence, it could be argued that discipline did have an effect on the use of hedges in Indonesian research articles, yet such effect was relatively small. The other finding was that the two groups of Indonesian scholars were different from each other in terms of their use of boosters, Mann-Whitney $U = 158.50$, $n_1 = n_2 = 26$, $p < 0.05$, $r = 0.46$. This is an indication that Indonesian applied linguists tended to use boosters in their articles more frequently than their colleagues from the chemistry field (applied linguistics mean rank 33.40 and chemistry mean rank 19.60, see also Table 5.5). The magnitude of the effect size (the difference from the two groups) suggested that the difference in the use of boosters between these two groups of Indonesian scholars was medium, which suggests that the disciplinary field to which the two groups of scholars belong did not largely affect their use of this interpersonal feature.

So far in this section, the results of within-language comparison of the two disciplines have been presented. The rest of the section is devoted to between-discipline comparison. That is, the two fields of applied linguistics and chemistry were compared in terms of their use of hedges and boosters. This time, the two corpora of a single discipline from the two languages were collapsed into one group. The two corpora constructed for this purpose were as follows: chemistry corpus (composed of Indonesian and English chemistry corpora) and applied linguistics corpus (generated from Indonesian and English applied linguistics corpora).
The following figure shows the total numbers of hedges and boosters observed in the two corpora under study.

![Bar chart showing total numbers of hedges and boosters by discipline](chart.png)

**Figure 5.6** Total numbers of hedges and boosters by discipline (languages combined)

The total number of features (hedges and boosters combined) identified in the chemistry corpus was 1,685, and in the applied linguistics corpus was 3,906. With the total of 1,027 hedging devices found, on average a chemistry article (regardless of the language in which it is written) used 19.75 hedges, while in the applied linguistics field the average use of the feature in a single article was 41.43. A single article in the field of chemistry used 12.19 boosters, on average. Much higher figure for the average use of boosters was evident in the applied linguistics corpus (30.91). The similarity between the two discipline-based corpora, as can be seen from the above chart, was that hedges were used more frequently than boosters. The proportion of hedges to the total features identified in chemistry was slightly larger than that found in applied linguistics, 61% vs. 57%. On the other hand, the latter discipline contained a larger proportion of boosters than the former, 43% vs. 39%.
Table 5.6 below presents the descriptive statistics for the use of hedges and boosters per 1,000 words in the two discipline-based corpora (languages combined).

### Table 5.6 Descriptive statistics by discipline (per 1,000 words)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Field</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hedges</td>
<td>Chemistry</td>
<td>52</td>
<td>0.00</td>
<td>18.26</td>
<td>7.40</td>
<td>3.88</td>
</tr>
<tr>
<td></td>
<td>App. Ling</td>
<td>52</td>
<td>1.03</td>
<td>27.76</td>
<td>7.32</td>
<td>5.09</td>
</tr>
<tr>
<td>Boosters</td>
<td>Chemistry</td>
<td>52</td>
<td>0.42</td>
<td>15.72</td>
<td>3.95</td>
<td>3.00</td>
</tr>
<tr>
<td></td>
<td>App. Ling</td>
<td>52</td>
<td>1.20</td>
<td>21.11</td>
<td>6.66</td>
<td>4.54</td>
</tr>
</tbody>
</table>

As it is clear from the above table, the average use of hedges per 1,000 in a single article in the chemistry field was comparable to that observed in the applied linguistics field. However, as indicated by the magnitude of standard deviation, there was greater uniformity among chemistry scholars in terms of their hedging use, compared to their colleagues from the applied linguistics field. As regard to the use of boosters, applied linguists were almost twice more likely to use the feature compared to the chemistry scholars, yet uniformity among scholars in terms of frequency of use of the feature was greater among chemistry scholars (again as indicated by the magnitude of the standard deviation relative to the mean).

The data on the frequency of use of hedges and boosters in the two discipline-based corpora were subjected to the Kolmogorov-Smirnov test of normality. The findings showed that only one of the four corpora passed the test, or in other words the majority of the corpora were not normally distributed: applied linguistics hedges, $D = 0.128$, $n = 52$, $p < 0.05$; applied linguistics boosters $D = 0.196$, $n = 52$, $p < 0.05$; chemistry hedges $D = 0.119$, $n = 52$, $p > 0.05$; chemistry boosters $D = 0.175$, $n = 52$, $p < 0.05$. Recall that when
the $p$ value is more than 0.05 the data can be considered as normally distributed. From the above mentioned results, it is clear that only the data for chemistry hedges showed normal distribution.

The application of the Mann-Whitney $U$ test to determine whether the use of the two features in the two fields (languages combined) produced the following findings: there was no significant difference in the use of hedges between chemistry and applied linguistics, (Mann-Whitney $U = 1,432.00$, $n1 = n2 = 52$, $p > 0.05$), indicating that the two groups of scholars (both languages combined) used hedges similarly frequently in their articles. For booster use, however, scholars from the two disciplines were significantly different from each other, (Mann-Whitney $U = 788.00$, $n1 = n2 = 52$, $p < 0.05$, $r = 0.68$, $r = -0.36$). This means that scholars from applied linguistics (mean rank = 63.35) used boosters significantly more frequently than those scholars from chemistry (mean rank = 41.65) (see also Table 5.6 above). However, although the two groups of scholars used boosters differently from each other, as indicated by the magnitude of the difference between them (the effect size), $r = -0.36$, which was medium, the discipline or field to which they belong did not play a large part in their rate of use of boosters in the articles.

5.6 Linguistic Realizations of Hedges and Boosters

Research question 5 in the present study explored the linguistic devices used by the two groups of scholars (English and Indonesian) from the two fields of applied linguistics and chemistry to hedge and boost propositions presented in their research articles. The question was concerned with the grammatical categories used to realize both interpersonal features of hedges and boosters in their articles.
5.6.1 Hedges

To reiterate, the total number of hedges identified in the English applied linguistics corpus was 1,808 and in the English chemistry corpus was 796. Therefore, a grand total of 2,604 hedging devices were deployed in the English corpus comprising of 52 research articles of 268,200 words. Of the total hedges observed in the entire English corpus, modal verbs were quite abundant (841 tokens). They made up 32.30% of the overall hedges. Verbs and adverbs were quite equally frequently used as hedges by the English scholars, with 29.26% (762 tokens) of the total hedges being the latter and 24% (625 tokens) the former. The use of adjectives to mark uncertainty by the English scholars was relatively small, accounting for only 11.44% (298 tokens) of the total hedges found. Finally, nouns were noticeably infrequent, representing only 3% (79 tokens) of the total hedges. This suggests that the English scholars did not rely on nouns to express their uncertainty.

In the entire Indonesian corpus (the two fields combined), 661 hedges were identified, where 429 (64.90%) of those hedges came from the applied linguistics corpus while the rest, 231 (34.95%), from the chemistry corpus. The hedges found in both Indonesian corpora came from four grammatical categories. These were noun, verb, adverb, modal verb, and adjective. The pattern found in the entire Indonesian corpus was rather different from the pattern found in the entire English corpus reported in the previous paragraph. Unlike in the entire English corpus, in the entire Indonesian corpus modal verbs did not constitute the most popular grammatical category. In fact, it was the second least preferred grammatical category used to express tentativeness after adjective; there were only 30 hedging modal verbs found in the entire Indonesian corpus,
accounting for only 4.54% of the total hedges found. Adverb was the most frequently-used grammatical category identified. Of the total hedges found, 463 (70.05%) were of the category of adverb. The category of verb was relatively infrequent in this corpus, which was 14.67% of the total hedges (97 tokens). Still less frequently used category was noun. The category of noun accounts for 9.08% (60 tokens) of the total hedges found. Finally, hedging adjectives (which were only used in the chemistry corpus) accounted for only 1.51% (10 tokens).

The following figure presents the composition of hedges across the two languages.

![Figure 5.7 Composition of Hedges across Languages](image)

As is clear from the above figure, the English and Indonesian scholars from the fields of applied linguistics and chemistry apparently were not similar in terms of the grammatical categories used to hedge their propositions. What was preferred by the English scholars (e.g. modal verbs) turned out to be unpopular among the Indonesian scholars. On the other hand, what was the least frequently used by the English scholars was in fact a quite
popular category. This was the case of noun. Finally, the category which was used by the English scholars quite frequently (i.e. adjective) was almost absent from the research articles of the Indonesian scholars.

5.6.1.1 Modal Verbs

Within the category of modal verb, may occurred most frequently as hedging markers in the entire English corpus. There were 505 tokens of such modal verb (60.05% of the total modal verbs) which could be identified in the entire English corpus. It is to be noted that may surfaced as the most popular modal verb not in one English corpus, but in both English corpora. In chemistry, more than half of the total modal verbs used were may (52.60%), and in applied linguistics the proportion of this modal verb was somewhat smaller (48.04%). The second most frequently-used modal verb in the entire English corpus was would, accounting for 28.54% (240 tokens) of the total modal verbs used. The least frequently-used modal verb was might. This modal verb represented only 11.41% (96 tokens) of the total modal verbs used in the entire corpus.

There were two lexical types of modal verb category found in the Indonesian corpus, both of which can be translated into the English may. By lexical type, it was simply meant to refer to distinct lexical item. These were mungkin and boleh. The total numbers of modal verbs used as hedges in the Indonesian applied linguistics and chemistry corpora were negligibly small. Only 21 modal verbs (4.90% of the total hedges) were found in applied linguistics corpus. The proportion of such grammatical category in chemistry corpus was even smaller, 7 (3.03% of the total hedges found in the corpus). The modal verb mungkin was used in the applied linguistics corpus 18 times,
accounting for 85.71% of the total modal verbs used, and 4.20% of the total hedges used in the corpus. In the chemistry corpus, besides mungkin, bisa (tentative version of dapat ‘can’) was also used as a hedging modal verb. This latter modal category was very rarely used in the corpus, accounting for only 0.87% (2 tokens) of the total hedges used.

The English modal can was also used as an epistemic modal to express tentativeness (Downing & Locke, 2006). Interestingly, however, in the research articles analyzed in the present study none of the cases could be unambiguously interpreted as an epistemic modal. For example, in the sentence (taken from an English applied linguistics article) “During reading the syntactic, semantic, and pragmatic knowledge that is activated, held in working memory, and utilized online during text processing can constrain subsequent textual and lexical interpretations” it is not clear whether can is used to express possibility or capacity. That is, it is not clear whether the writer intends to say that it is possible for pragmatic knowledge to constrain subsequent textual and lexical interpretations or she intends to argue that pragmatic knowledge has the capacity to constrain such interpretations. English modal can seems to be used epistemically very rarely in research articles. In fact, Collins (2007) showed that out of 10,608 cases in which the modal was used only 1.1% of those cases contained the modal used epistemically. It was also true of the past tense of the modal (could). Part of the problem in determining whether could is used as an epistemic or dynamic (i.e. express capacity) modal lied in the tense of the sentence in which it is used: “… there were on average fewer words to revise and learn from the more familiar condition compared to the less familiar condition, which could have freed up attentional resources during the
verification task to better enable some learners to concentrate on correcting the words that were incorrectly guessed” (English applied linguistics).

Like *can*, the Indonesian corresponding modal (*dapat*) was also inherently ambiguous. *Dapat* was typically used in the Conclusion section of chemistry articles, as part of the lexical bundle “*Dapat disimpulkan bahwa …*” (‘It can be concluded that …’). Used in such situation, it was extremely difficult to determine whether the modal is used dynamically (i.e. to express the notion that there is a situation to enable us to conclude) or epistemically (i.e. to deliver the message that it is possible to conclude). None of the uses of *dapat* in Indonesian research articles could be unambiguously interpreted as epistemic use of the modal.

Table 5.7 below presents the descriptive statistics of modal verbs used as hedges across fields and languages. The figures shown in the table represent normed figures (per 1,000 words). Because it was not possible to map the modal verbs from the two languages on a one-on-one basis, it was necessary to collapse two or more modal verbs having the same semantic properties into a single type. This was done to enable comparison across the two languages. For example, the Indonesian modal verbs *mungkin* and *boleh* were collapsed into a single type, given that they share the same semantic properties, in that both mean ‘may.’ Similarly, the English modal verbs *may* and *might* were collapsed into a single category due to the same semantic properties they share, although one might argue that *might* suggests higher degree of tentativeness than *may*. The decision to collapse the two English modal verbs, as has been alluded above, was triggered by the absence of similar linguistic system in Indonesian. *Mungkin* and *boleh* cannot be distinguished in terms of degree of tentativeness expressed, as *may* and *might*...
in English. Rather, they are merely different lexicons used to project tentativeness (see Alwi, 1992). Finally, the English modal verb *would* is not readily translatable into Indonesian hedging modal verb. In fact, the Indonesian translation of such modal verb (*akan* ‘will’) turns out to be a booster. There is no tentative version of the modal verb *akan* in Indonesian (see Alwi, 1992), as *would* is the tentative version of *will* in English.

**Table 5.7** Descriptive Statistics Of Modal Verb *May* across Fields and Languages (Per 1,000 Words)

<table>
<thead>
<tr>
<th>Field</th>
<th>Language</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied ling.</td>
<td>English</td>
<td>26</td>
<td>0.36</td>
<td>13.35</td>
<td>2.76</td>
<td>2.58</td>
</tr>
<tr>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.00</td>
<td>0.78</td>
<td>0.17</td>
<td>0.27</td>
</tr>
<tr>
<td>Chemistry</td>
<td>English</td>
<td>26</td>
<td>0.00</td>
<td>3.90</td>
<td>1.22</td>
<td>0.98</td>
</tr>
<tr>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.00</td>
<td>1.22</td>
<td>0.15</td>
<td>0.34</td>
</tr>
</tbody>
</table>

Clearly, while all articles in the English applied linguistics corpus contained the hedging modal *may* (or *might*), some of the articles in the other three corpora contained no such modal verb at all. In the English chemistry corpus, there were a total of four articles (15% of the total articles in the corpus) which did not use any hedging modal verb *may* (or *might*). A considerable number of articles used no hedging modal verb in both fields in the Indonesian corpora; there were 16 articles in each of the two fields which did not use such modal verb at all, accounting for 62% of the total articles included in each corpus. With the exception of the figure for Indonesian chemistry, all those figures shown in the Maximum column were indeed outliers. The table also clearly reveals that the means for both fields in the English corpora were larger than those for the corresponding fields in the Indonesian corpora. The following are examples where hedging *may* is used in research articles in both languages and disciplines.
This shortfall in the data may be attributable, at least in part, to an assumption or an unquestioned implied default position that one’s knowledge of complete or whole word forms develops ‘automatically’ as one’s L2 knowledge increases.

Amide reduction may be facilitated by the formation of ring-stabilised zwitterions...

Pencerita mungkin tidak menyadari struktur tersebut, atau mungkin sadar tetapi sengaja disembunyikan. ('The teller may not be aware of the structure, or may be aware of it but it is intentionally hidden')

Hal ini mungkin terjadi karena senyawa isolat berwarna hijau kekuningan ...

('This may happen because isolator compound is yellowish green …')

The results of normality of distribution test run on the data sets using Kolmogorov-Smirnov test indicated that three of the four data sets for hedging may were indeed not normally distributed: English applied linguistics, $D = 0.18$, $n = 26$, $p < 0.05$; Indonesian applied linguistics, $D = 0.38$, $n = 26$, $p < 0.05$; English chemistry, $D = 0.16$, $n = 26$, $p > 0.05$; and Indonesian chemistry, $D = 0.48$, $n = 26$, $p < 0.05$.

Table 5.8 below displays the descriptive statistics for the data on hedging may across languages (fields combined). The mean for the entire English corpus was 1.99 (SD = 2.08), whereas the mean for the entire Indonesian corpus was 0.16 (SD = 0.30). If we look at the magnitudes of the standard deviations for the two corpora, we can conclude that the data values for both corpora were widely dispersed, since the standard deviations...
were in excess of the respective means, although in this regard Indonesian corpus was more uniform than the English corpus. The formal Kolmogorov-Smirnov test revealed that the two data sets were not normally distributed, English, $D = 0.17$, $n = 52$, $p < 0.05$ and Indonesian, $D = 0.43$, $n = 52$, $p < 0.05$.

Table 5.8 Descriptive Statistics of Modal Verb *May* across Languages (Per 1,000 Words, Fields Combined)

<table>
<thead>
<tr>
<th>Language</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>52</td>
<td>0.36</td>
<td>13.35</td>
<td>1.99</td>
<td>2.08</td>
</tr>
<tr>
<td>Indonesian</td>
<td>52</td>
<td>0.00</td>
<td>1.22</td>
<td>0.16</td>
<td>0.30</td>
</tr>
</tbody>
</table>

Mann-Whitney $U$ test was run to examine whether the English scholars (both fields combined) indeed used the hedging modal verb *may* significantly differently from the Indonesian scholars (between-language comparison). The result showed that there was a significant difference between the mean for the English corpus and Indonesian corpus, Mann-Whitney $U = 207.00$, $n_1 = n_2 = 52$, $p < 0.05$, $r = -0.76$. This means that English scholars from the two fields used modal verbs to indicate uncertainty significantly more frequently in their articles than the corresponding Indonesian scholars (English mean rank = 74.52 and Indonesian mean rank = 30.48; see also Table 5.4 above). The magnitude of the effect size ($r = -0.76$), which shows the degree of difference between the two groups under comparison, indicates that the variable sociocultural context exerted a fairly large effect on the use of modal verb *may*.

Within-field comparison was also carried out to determine whether two groups of scholars from the same field, but writing in the two different languages, used the hedging *may* at significantly different rates. The results of the test revealed that the mean for the
English scholars from applied linguistics corpus was significantly different from the mean for the Indonesian scholars from the same field, Mann-Whitney $U = 16.00$, $n_1 = n_2 = 26$, $p < 0.05$, $r = -0.83$, meaning that English applied linguists used significantly more hedging *may* than the corresponding Indonesian linguists (English mean rank = 38.88 and Indonesian mean rank = 14.12; see also Table 5.7 above). The large effect size ($r = -0.83$) indicates that sociocultural context factor brought about significant effect on the use of hedges in applied linguistics. Significant difference was also obtained between the mean for the English scholars from chemistry and the Indonesian scholars from the same field, Mann-Whitney $U = 86.00$, $n_1 = n_2 = 26$, $p < 0.05$, $r = -0.68$; the former groups of scholars used the modal *may* significantly more frequently in their articles than the latter group of scholars (English mean rank = 36.19 and Indonesian mean rank = 16.81; see Table 5.7 above). The effect size for chemistry was somewhat smaller ($r = -0.68$) compared to that found for applied linguistics although it also fell into the category of large effect, indicating that the variable sociocultural context exerted smaller effect on the use of the modal verb *may* in this field, compared to the other discipline.

Within-language comparison was carried out to determine whether the two fields from the same language were different in terms of their use of hedging *may*. The findings showed that the two groups of scholars writing in the two languages were different in this respect. There existed a significant difference between English chemistry and English applied linguistics, Mann-Whitney $U = 172.00$, $n_1 = n_2 = 26$, $p < 0.05$, $r = -0.42$. This indicates that English applied linguistics scholars used hedging *may* more frequently in their articles than chemistry scholars (English applied linguistics mean rank, 32.88 and English chemistry mean rank, 20.12, see also Table 5.7 above). The magnitude of the
effect size ($r = -0.42$) indicates that discipline effect was medium. In other words, the discipline to which they belong did not largely affect their use of hedging *may*. On the other hand, there was no significant difference between the Indonesian applied linguistics scholars and their counterparts working within the discipline of chemistry, Mann-Whitney $U = 299.50$, $n1 = n2 = 26$, $p > 0.05$, which indicates that the two groups of scholars were not different in terms of frequency of use of hedging *may* in their articles. In turn, it suggests that for Indonesian scholars their affiliation with a particular discipline did not affect their use of hedging *may*.

### 5.6.1.2 Adverbs

A total of 762 adverbs functioning as hedges were used in the entire English corpus, with 514 (67.45%) of them came from the applied linguistics corpus and 248 (32.55%) from the chemistry corpus. As such, on average a single article (regardless of the field) contained 14.65 hedging adverbs, or a single article from applied linguistics had 19.77 adverbs and one from chemistry 9.54 adverbs. As could be expected, due to the smaller size of the corpus, the entire Indonesian corpus contained smaller number of hedging adverbs. A total of 463 adverbs were used in the entire Indonesian corpus, 340 of which were contained in the applied linguistics corpus and 123 from the chemistry corpus. This means that a single article (regardless of field) on average contained 8.90 adverbs used as hedges, whereby a single article from the Indonesian applied linguistics corpus contained 13.08 adverbs on average and a single article from the chemistry corpus contained 4.73 such adverbs. The following are examples of usage of hedging adverbs in the two languages and disciplines.
Perhaps (their accounts of) their biographies are distinctively negative. (AL)

Among phosphorylated samples, the extrudates prepared at pH 9.0 generally contained a higher phosphorus content than those prepared at pH 11.0, with the exception of Hylon VII. (CH)

Dalam perspektif fungsional, ungkapan tradisional itu biasa digunakan dalam realitas kehidupan GTM ... (AL)

(‘In functional perspective, those traditional idioms usually are used in life reality of GTM …’)

Selain kandungan gizinya yang tinggi, tanaman pare juga mengandung khasiat sebagai obat, sehingga sering dimanfaatkan sebagai bahan ramuan jamu ... (CH)

(‘Besides its high nutrient content, bitter cucumber plants are also useful as medicine, thus it is often used as ingredients for herbal drinks …’)

The mean usage of hedging adverbs for the entire English corpus was 2.68 per 1,000 words (SD = 1.38), whereas for the entire Indonesian corpus it was 3.09 (SD = 3.04). The descriptive statistics of the hedging adverb data for the four corpora is shown in the following table.

<table>
<thead>
<tr>
<th>Field</th>
<th>Language</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Ling.</td>
<td>English</td>
<td>26</td>
<td>0.48</td>
<td>6.03</td>
<td>2.87</td>
<td>1.37</td>
</tr>
<tr>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.24</td>
<td>18.50</td>
<td>2.66</td>
<td>3.50</td>
</tr>
<tr>
<td>Chemistry</td>
<td>English</td>
<td>26</td>
<td>0.00</td>
<td>5.29</td>
<td>2.49</td>
<td>1.40</td>
</tr>
<tr>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.00</td>
<td>10.65</td>
<td>3.53</td>
<td>2.49</td>
</tr>
</tbody>
</table>
As shown by the table above, there was at least one article from the field of chemistry in both languages which did not contain any hedging adverb at all. There was one (3.85% of the total articles included) article in the English chemistry corpus which did not contain any hedging adverb at all, whereas in the Indonesian chemistry corpus there were four (15.38%) articles with no hedging adverb. Among the four figures included in the Maximum column, the figure for the Indonesian applied linguistics was an outlier. The mean for the English applied linguistics corpus was slightly larger than that for the corresponding Indonesian corpus, whereas the mean for the Indonesian chemistry corpus was larger than that for the English corpus. The standard deviations shown in the table above suggest that the data for English corpus were less dispersed than the data for the Indonesian corpus.

The four data sets were examined in terms of their distribution using Kolmogorov-Smirnov test. The results of the test indicated that only the data set for the Indonesian applied linguistics corpus did not pass the normality test: English applied linguistics, $D = 0.13, n = 26, p > 0.05$; English chemistry, $D = 0.09, n = 26, p > 0.05$; Indonesian applied linguistics, $D = 0.35, n = 26, p < 0.05$; and Indonesian chemistry, $D = 0.09, n = 26, p > 0.05$.

Since the majority of data sets did display normal distribution, it was decided that the comparisons between two groups were conducted using the parametric test (independent samples t-test). First, the test was run to compare the entire English and Indonesian corpora (both fields combined). The finding indicates that there was no significant difference between the mean for the English entire corpus and that for the Indonesian entire corpus, $t (71.21) = -0.89, p > 0.05$, suggesting that Indonesian and
English scholars from the two fields under study used hedging adverbs at comparable frequency rates in their articles. In other words, the variable sociocultural context did not seem to have any effect on the use of hedging adverbs. Subsequently, another test was run to examine whether scholars from the same field across the two languages used hedging adverbs at different rates (within-field comparison). The result for applied linguistics indicated that there was no significant difference between the mean for the English applied linguistics and that for the Indonesian applied linguistics, \( t(50) = 296, p > 0.05 \), suggesting that the two groups of applied linguists writing in the two languages used hedging adverbs at comparable frequency rates in their articles. Similar finding was also obtained for the chemistry discipline, \( t(39.32) = -1.86, p > 0.05 \). Like the applied linguists, the two groups of scholars from chemistry writing in the two languages also were no different from each other in terms of frequency of use of the features. These findings suggested that the sociocultural context factor did not have any significant effect on the use of hedging adverbs by the two groups of scholars in the two disciplines. The within-language test carried out revealed that no significant difference was evident between English applied linguists and chemistry scholars, \( t(50) = 0.10, p > 0.05 \). Likewise, Indonesian chemistry scholars and applied linguists were not significantly different from each other in regard to their rate of use of hedging adverbs, \( t(50) = -1.04, p > 0.05 \). These suggested that the two groups of scholars in both languages did not use hedging adverbs at different rates from each other. This can be translated as the absence of discipline effect with respect to the frequency of use of hedging adverbs in the writing of both groups of scholars writing in the two languages.
Taxonomy of hedging adverbs based on the semantics of the adverbs was developed into which all of the adverbs collected from the two major corpora (English and Indonesian, fields combined) were categorized. The taxonomy contained three categories, namely approximation, generalization and likelihood. Approximation referred to expressions which indicate coyness, for example fairly, quite, relatively, somewhat (English corpus), kurang lebih ‘more or less’, hampir ‘almost’, kira-kira ‘about’ agak ‘quite’/‘rather’ (Indonesian corpus). Generalization was defined as expressions used to indicate that the truth value of the proposition being presented should be taken in general terms. Included in this category was commonly, usually, normally, typically (English corpus), biasa ‘usually’, secara umum ‘generally’, lazim ‘typically’, sering ‘often’. Finally, likelihood was used to refer to expressions which suggest the writer’s assessment of the extent to which the proposition being presented holds true. This last category includes possibly, perhaps, potentially (English corpus), mungkin ‘perhaps’ (Indonesian).

Out of the 762 hedging adverbs identified in the entire English corpus, 252 (33.07%) were of the likelihood category, 332 (43.57%) were of the generalization category, and 178 (23.36%) of the approximation category. The total 463 Indonesian hedging adverbs identified comprised of 155 (33.48%) approximation adverbs, 265 (57.24%) generalization adverbs and 43 (9.29%) likelihood adverbs. The following chart graphically presents the composition of the hedging adverbs found in both languages.
As shown by the figure above, there was a striking difference between the pattern found in the entire English corpus and that found in the entire Indonesian corpus, although in both corpora generalization hedging adverbs were the most popular adverb category functioning as hedges. Generally speaking, the adverbs in the English corpus were quite evenly spread into the three categories. In the Indonesian corpus, however, the adverbs were nearly concentrated on only two categories. It was evident that the Indonesian scholars from the two fields tried to avoid using adverbs which suggested that they were uncertain of the truth value of their propositions. This is shown by the smallest frequency of likelihood adverbs in their articles.

The data from the two major corpora were subsequently split into fields (applied linguistics and chemistry) to see if the same field from the two languages exhibited the same pattern in terms of composition of hedging adverbs. This time the data were transformed into proportions. Figure 5.6 below shows clearly that while the field of applied linguistics from the two languages displayed radically different patterns, similar
patterns were evident across the two languages from the field of chemistry. The Indonesian applied linguistics corpus was characterized by the use of only two adverb categories (approximation and generalization), with the almost complete absence of likelihood adverbs. The two corpora making up the English corpus displayed similar patterns, although the proportions of the three adverb categories across the two English corpora were quite different; English applied linguistics corpus contained more generalization adverbs than chemistry corpus. On the other hand, the latter had more of the other two adverb categories (approximation and likelihood) than the former. Interestingly, the pattern displayed by the English chemistry corpus was similar to that evident in the Indonesian chemistry corpus. More specifically, the proportion of the category of generalization was almost the same across the two languages.

![Figure 5.9 Hedging Adverbs across Fields and Languages](image)

The data were further processed to see the rate of usage (per 1,000 words) of each of the adverb categories in each of the fields in both languages, and to see if the differences present were indeed statistically significant. The comparisons were focused on (1)
differences across languages where the fields were combined (between-language), (2)
differences across the same field from the two languages (within-field) and (3)
differences across fields within the same language (within-language). Table 5.9 below
provides information on the descriptive statistics of the data for the between-language comparison.

Table 5.10 Descriptive Statistics of Hedging Adverbs across Languages

<table>
<thead>
<tr>
<th>Adverb Category</th>
<th>Language</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approximation</td>
<td>English</td>
<td>52</td>
<td>0.00</td>
<td>6.50</td>
<td>0.77</td>
<td>1.03</td>
</tr>
<tr>
<td></td>
<td>Indonesian</td>
<td>52</td>
<td>0.00</td>
<td>5.04</td>
<td>1.03</td>
<td>1.33</td>
</tr>
<tr>
<td>Generalization</td>
<td>English</td>
<td>52</td>
<td>0.00</td>
<td>3.62</td>
<td>1.12</td>
<td>0.89</td>
</tr>
<tr>
<td></td>
<td>Indonesian</td>
<td>52</td>
<td>0.00</td>
<td>18.50</td>
<td>1.85</td>
<td>2.70</td>
</tr>
<tr>
<td>Likelihood</td>
<td>English</td>
<td>52</td>
<td>0.00</td>
<td>3.60</td>
<td>0.90</td>
<td>0.76</td>
</tr>
<tr>
<td></td>
<td>Indonesian</td>
<td>52</td>
<td>0.00</td>
<td>6.09</td>
<td>0.67</td>
<td>1.25</td>
</tr>
</tbody>
</table>

The table above shows that at least one article in each of the two major corpora did not
contain each of the three adverb categories. The English corpus contained nine (17.3%)
articles with no hedging approximation adverb and in the Indonesian corpus there were
19 (36.5%) articles having no such adverb. The number of articles containing no hedging
generalization adverb was also bigger in the entire Indonesian corpus than in the entire
English corpus: Indonesian, 11 (21.2%) versus English, six (11.5%). It was also true of
the number of articles containing no hedging likelihood adverb: Indonesian, 31 (59.6%)
versus English, 5 (9.6%). All of the maximum numbers shown in the table (for all adverb
categories in both languages) turned out to be outliers. As can be seen from Table 5.9,
whereas the means for approximation and generalization categories were larger in the
Indonesian corpus, the mean for likelihood category was larger in the English corpus. Finally, the magnitudes of the standard deviations (relative to the means) suggested that the data for the three categories in both languages were widely spread out from the mean. The data were then checked their distribution prior to their being subjected to an inferential statistical analysis. The results of the formal test of normality distribution showed that the data for all categories in both languages were not normally distributed: English likelihood (D = 0.15, n = 52, p < 0.05), Indonesian likelihood (D = 0.30, n = 52, p < 0.05), English generalization (D = 0.15, n = 52, p < 0.05), Indonesian generalization (D = 0.25, n = 52, p < 0.05), English approximation (D = 0.23, n = 52, p < 0.05), and Indonesian approximation (D = 0.22, n = 52, p < 0.05).

Given that all of the data sets were not normally distributed, the appropriate statistical tool to see whether the rate of usage of the three categories of adverbs was different between the two groups was the non-parametric test for comparing two groups (i.e. Mann-Whitney U test). The results of the test indicated that there was no significant difference in the use of two of the three adverb categories (approximation and generalization) by the two groups of scholars: approximation adverbs, Mann-Whitney U = 1.316.00, n1 = n2 = 52, p > 0.05 (English mean rank = 53.19 and Indonesian mean rank = 51.81); generalization adverbs, Mann-Whitney U = 1,601.00, n1 = n2 = 52, p > 0.05 (English mean rank = 47.71 and Indonesian mean rank = 57.29). These results indicated that the English scholars and Indonesian scholars in the two fields used the two categories of hedging adverbs at comparable rates. In other words, the variable sociocultural context did not exert sufficient influence on the use of the two categories of hedging adverbs. On the other hand, there was a significant difference in the use of
likelihood adverbs by the two groups of scholars, Mann-Whitney $U = 775.00$, $n_1 = n_2 = 52$, $p < 0.05$, $r = -0.38$. As shown by Table 5.9, the English scholars used significantly more likelihood adverbs in their articles than the Indonesian scholars. The effect of the variable language on the use of this category of hedging adverbs was medium ($r = -0.38$).

The subsequent analytical stage carried out was to determine if there was a within-discipline difference. That is, the examination was focused on whether the two groups of scholars working within the same field across the two languages used the three adverb categories significantly differently from each other, for example between the English applied linguistics scholars and the Indonesian applied linguistics scholars. Table 5.10 below presents the descriptive statistics of the data for such question.

### Table 5.11 Descriptive statistics of hedging adverbs across fields and languages

<table>
<thead>
<tr>
<th>Field</th>
<th>Adv. Category</th>
<th>Language</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>App. Ling.</td>
<td>Approximation</td>
<td>English</td>
<td>26</td>
<td>0.00</td>
<td>2.30</td>
<td>0.61</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.00</td>
<td>5.04</td>
<td>0.97</td>
<td>1.31</td>
</tr>
<tr>
<td></td>
<td>Generalization</td>
<td>English</td>
<td>26</td>
<td>0.17</td>
<td>3.31</td>
<td>1.39</td>
<td>0.95</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.24</td>
<td>18.50</td>
<td>2.66</td>
<td>3.50</td>
</tr>
<tr>
<td></td>
<td>Likelihood</td>
<td>English</td>
<td>26</td>
<td>0.00</td>
<td>3.60</td>
<td>0.88</td>
<td>0.73</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.00</td>
<td>0.24</td>
<td>0.02</td>
<td>0.06</td>
</tr>
<tr>
<td>Chemistry</td>
<td>Approximation</td>
<td>English</td>
<td>26</td>
<td>0.00</td>
<td>6.50</td>
<td>0.94</td>
<td>1.36</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.00</td>
<td>4.57</td>
<td>1.09</td>
<td>1.37</td>
</tr>
<tr>
<td></td>
<td>Generalization</td>
<td>English</td>
<td>26</td>
<td>0.00</td>
<td>3.62</td>
<td>0.85</td>
<td>0.76</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.00</td>
<td>3.50</td>
<td>1.05</td>
<td>1.13</td>
</tr>
<tr>
<td></td>
<td>Likelihood</td>
<td>English</td>
<td>26</td>
<td>0.00</td>
<td>3.21</td>
<td>0.92</td>
<td>0.81</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.00</td>
<td>6.09</td>
<td>1.33</td>
<td>1.51</td>
</tr>
</tbody>
</table>

Within the field of applied linguistics, the means for approximation and generalization adverb categories were larger in the Indonesian corpus, whereas the mean for likelihood
adverb category was larger in the English corpus. Within chemistry, however, the picture was quite different; the Indonesian corpus had larger means for the three adverb categories. The magnitudes of the standard deviations (relative to the means) of each of the data sets suggested that the data values were spread out widely from the mean. This was confirmed by the presence of outliers in each of the data sets. In fact, nine of the 12 values presented in the Maximum column in Table 5.6 above were some of the outliers present in all of the data sets. The results of the Kolmogorov-Smirnov test of normality are presented in the following table.

Table 5.12 Results of Normality of Distribution Test

<table>
<thead>
<tr>
<th>Field</th>
<th>Adverb Category</th>
<th>Language</th>
<th>Kolmogorov-Smirnov</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Statistic</td>
</tr>
<tr>
<td>App. Ling.</td>
<td>Approximation</td>
<td>English</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indonesian</td>
<td>0.26</td>
</tr>
<tr>
<td></td>
<td>Generalization</td>
<td>English</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indonesian</td>
<td>0.35</td>
</tr>
<tr>
<td></td>
<td>Likelihood</td>
<td>English</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indonesian</td>
<td>0.53</td>
</tr>
<tr>
<td>Chemistry</td>
<td>Approximation</td>
<td>English</td>
<td>0.26</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indonesian</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td>Generalization</td>
<td>English</td>
<td>0.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indonesian</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>Likelihood</td>
<td>English</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indonesian</td>
<td>0.26</td>
</tr>
</tbody>
</table>

As can be seen from Table 5.11 above, only three out of 12 data sets had normal distribution, namely generalization (English chemistry), approximation (Indonesian applied linguistics) and approximation (Indonesian applied linguistics). Because the majority of the data sets were not normally distributed, the inferential statistical tool used...
to examine whether there was a significant difference between the two groups of scholars working within the same field was Mann-Whitney U test. The results indicated that there was a significant difference only between the means for likelihood category in the field of applied linguistics. The English scholars in this field used likelihood hedging adverbs significantly more frequently than the corresponding Indonesian scholars (English mean rank = 38.19 and Indonesian mean rank = 14.81; see also Table 5.11 above). It is to be noted that the effect of the variable sociocultural context on the use of such adverb category was noticeably large, as shown by the effect size ($r$). The following table presents the statistical information of these results.

Table 5.13 Results of the Mann-Whitney U Test for hedging adverb categories

<table>
<thead>
<tr>
<th>Field</th>
<th>Adverb category</th>
<th>N</th>
<th>Statistic</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mann-Whitney</td>
<td>df</td>
<td>Sig. ($\alpha$)</td>
<td>r</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>U</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>App. Ling.</td>
<td>Approximation</td>
<td>52</td>
<td>326.00</td>
<td>50</td>
<td>0.83</td>
<td>-0.03</td>
</tr>
<tr>
<td></td>
<td>Generalization</td>
<td>52</td>
<td>446.50</td>
<td>50</td>
<td>0.05</td>
<td>0.28</td>
</tr>
<tr>
<td></td>
<td>Likelihood</td>
<td>52</td>
<td>34.00</td>
<td>50</td>
<td>0.00</td>
<td>-0.82</td>
</tr>
<tr>
<td>Chemistry</td>
<td>Approximation</td>
<td>52</td>
<td>337.50</td>
<td>50</td>
<td>0.99</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Generalization</td>
<td>52</td>
<td>354.50</td>
<td>50</td>
<td>0.76</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>Likelihood</td>
<td>52</td>
<td>349.00</td>
<td>50</td>
<td>0.84</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Table 5.12 above also shows that the difference between the means for the category of generalization was marginally significant. Taken together, with the exception of likelihood hedging adverb category in applied linguistics, English and Indonesian scholars from the two fields used hedging adverbs at comparable rates in their articles. This suggested that although they used hedging adverbs with relatively the same rates,
but when it came to using adverbs to indicate the extent to which their propositions held true in reality, the Indonesian scholars, especially from the field of applied linguistics, were more reluctant to use them in their articles. As can be seen from the table above, the effect size for this category was very large, indicating that the sociocultural context in which scholars wrote their articles substantively influenced their usage of such hedging adverb category.

The last test run on the data on the hedging adverb categories was the within-language comparison to see if the two fields from the same language differed in terms of their usage of those adverb categories. The following table presents the statistical information of the results for the Indonesian and English corpora.

<table>
<thead>
<tr>
<th>Table 5.14</th>
<th>Results of the Mann-Whitney U Test for Hedging Adverb Categories within Indonesian and English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language</td>
<td>Adverb category</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Indonesian</td>
<td>Approximation</td>
</tr>
<tr>
<td></td>
<td>Generalization</td>
</tr>
<tr>
<td></td>
<td>Likelihood</td>
</tr>
<tr>
<td>English</td>
<td>Approximation</td>
</tr>
<tr>
<td></td>
<td>Generalization</td>
</tr>
<tr>
<td></td>
<td>Likelihood</td>
</tr>
</tbody>
</table>

Table 5.13 above shows that within the Indonesian corpus the two fields were significantly different in terms of their usage of two of the three categories (generalization and likelihood), whereas in terms of their usage of adverbs of approximation category they were not significantly different. As indicated by Table 5.10
above, Indonesian scholars from the field of applied linguistics used generalization hedging adverbs more frequently than their colleagues from the chemistry field (applied linguistics mean rank 32.46 and chemistry mean rank 20.54). The magnitude of the effect size as shown in Table 5.13 above indicated that the effect of discipline on the use of such category of hedging adverbs was medium. However, when it came to the use of likelihood hedging adverbs, chemistry scholars were more likely to use the adverbs compared to the scholars from the field of applied linguistics (chemistry mean rank 35.73 and applied linguistics mean rank 17.27, see also Table 5.10). This time the effect of discipline was even larger than that found for generalization category. As for the English corpus, significant difference was evident only for the category of generalization, whereby scholars from applied linguistics used the hedging markers more frequently than those from chemistry (applied linguistics mean rank 30.92 and chemistry mean rank 22.08, see also Table 5.10 above). As shown by the effect size ($r = -0.29$), which was small to medium, the factor discipline did not contribute much to the differential usage between the two groups of English scholars. For the other two categories of hedging adverbs (approximation and likelihood), the two groups of English scholars were not significantly different from each other, indicating that they were in fact comparable in terms of frequency of usage of the two categories. This in turn suggested that discipline did not have any effect on the use of these categories of adverbs for the English scholars from the two disciplines.
5.6.1.3 Verbs

The entire English corpus contained a total of 625 verbs functioning as hedges; the English applied linguistics corpus contributed 390 verbs and chemistry corpus 235 verbs. This indicated that on average a single English article (regardless of field) carried 12.02 hedging verbs, or to be more specific, a single applied linguistics article written in English had 15 hedging verbs, while a single chemistry article had 9.04. The fact that the applied linguistics corpus contained more devices than the chemistry corpus could be explained by the differential length of the two corpus, where the articles included in the former were longer than those in the latter.

The entire Indonesian corpus contained 97 verbs used to hedge propositions. Interestingly, although the size of the Indonesian applied linguistics corpus was larger than the Indonesian chemistry corpus the latter contained more hedging verbs than the former: applied linguistics, 40 verbs and chemistry, 57 verbs. This indicated that a single article (regardless of field) within the Indonesian corpus had 1.87 verbs on average, or a single applied linguistics article contained 1.54 verbs and a single chemistry article contained 2.19 verbs. The aforementioned information about the usage of hedging verbs in the four corpora is presented in the following figure.
The numbers shown in the figure above were raw numbers (i.e. total hedging verbs identified in the corpus), and hence were not readily comparable, for the reason that the four corpora were not of the same size.

It is to be noted that the lexical types found in the four corpus making up the entire corpus (English applied linguistics, English chemistry, Indonesia applied linguistics, and Indonesian chemistry) were similar. That is, almost all verbs found in the Indonesian corpus were the direct translation of the corresponding English verbs, or vice versa. By lexical types, it was meant different lexicons. For example, *indicate* and *seem* were considered as different lexical types. Because of such similarity in the lexical (verb) types used to hedge propositions by the two groups of scholars from both fields, there was no need to further break down the data for further analysis like the one conducted on the data for hedging adverbs described above. In fact, compared to the lexical types belonging to the category of adverbs, the total number of lexical types within the category of verbs was relatively small. This was evident in both corpora (English and
The results of the study suggest that productive vocabulary knowledge can be broken down and investigated by analyzing production patterns for both partial and fully produced words that learners have recently attempted to learn. (AL)

These results indicated some differences in the reactions of 2a and 2b. (CH)

Pemakaian kata sapaan ema ‘Bapak’ dalam ema pastor ‘Bapak Pastor’ diasumsikan dilatari oleh norma tutur dalam UKEM. (AL)

(The use of address term ema ‘father’ in ema pastor ‘Father Pastor’ is assumed to be motivated by speech norms in in UKEM.)

Dari penggalan di atas dapat diindikasikan bahwa senyawa pada puncak 1 dengan berat molekul 186 identik dengan heksil n-valerat (C11H22O2), yang struktur molekulnya dapat dilihat pada Gambar 3. (CH)

(‘From the above excerpt it can be indicated that the compound on peak 1 with molecule weight of 186 is identical with hexyl n-valerate (C11H22O2), whose molecule structure can be seen in Image 3.’)

The mean use of hedging verbs in the English corpus (fields combined) was 2.29 verbs per 1,000 words, with the standard deviation of 1.35, whereas in the Indonesian corpus it was 0.92, with the standard deviation of 1.47. The following table presents the rate of use (per 1,000 words) of hedging verbs in the four corpora.
The above table shows that there were some articles (from both fields in the Indonesian corpus and the field of chemistry from the English corpus) which did not contain any single verb functioning as a hedge. Inspection of the data revealed that two (8%) of the English chemistry articles contained no hedging verb at all. In the Indonesian corpus, 14 (54%) of the applied linguistics articles and 7 (26.92%) of the chemistry articles contained no hedging verb at all. The maximum number of usage of hedging verbs as shown in the above table, with the exception of that for English chemistry, turned out to be outliers. The table also shows that the mean usage of hedging verbs in the English corpora was higher than that in the corresponding Indonesian corpora. Finally, seen from the magnitudes of the standard deviations, it seemed that the dispersion of the data in the four data sets was not uniform; apparently, the English data sets were less widely dispersed from the Indonesian data sets.

The results of the formal test of normality of distribution indicated that the data sets in the English corpus were normally distributed, whereas in the data sets in the Indonesian corpus were not: English applied linguistics, $D = 0.14, n = 26, p > 0.05$; English chemistry, $D = 0.14, n = 26, p > 0.05$; Indonesian applied linguistics, $D = 0.29, n = 26, p < 0.05$; Indonesian chemistry, $D = 0.26, n = 26, p < 0.05$. 

<table>
<thead>
<tr>
<th>Field</th>
<th>Language</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Linguistics</td>
<td>English</td>
<td>26</td>
<td>0.66</td>
<td>5.20</td>
<td>2.20</td>
<td>1.12</td>
</tr>
<tr>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.00</td>
<td>2.29</td>
<td>0.33</td>
<td>0.59</td>
</tr>
<tr>
<td>Chemistry</td>
<td>English</td>
<td>26</td>
<td>0.00</td>
<td>5.39</td>
<td>2.37</td>
<td>1.57</td>
</tr>
<tr>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.00</td>
<td>8.51</td>
<td>1.51</td>
<td>1.83</td>
</tr>
</tbody>
</table>
Given the results of the normality tests, to see whether the mean differences observed among the four data sets were indeed statistically significant, the data sets were subjected to Mann-Whitney $U$ test. The results of the Mann-Whitney $U$ test show that there was a significant difference between the mean usage of hedging verbs by the English scholars (from both fields) and the mean usage by the Indonesian scholars, $\text{Mann-Whitney } U = 489.00, n1 = n2 = 52, p < 0.05, r = -0.55$, meaning that the English scholars from both fields were indeed using hedging verbs significantly more frequently than the Indonesian scholars (also from both fields) (English mean rank 69.10 and Indonesian mean 35.90, see also table 5.14 above). The magnitude of the effect size indicated that the effect of the variable language was quite large. Significant difference was reached for the mean difference observed between the English applied linguistics corpus and the Indonesian applied linguistics corpus, $\text{Mann-Whitney } U = 32.50, n1 = 2 = 26, p < 0.05, r = -0.78$. This meant that English applied linguists used the verbs significantly more frequently in their articles than their Indonesian counterparts (English mean rank 38.25 and Indonesian mean rank 14.75, see also Table 5.14 above). The effect size of this comparison, which was large, suggested that the variable sociocultural context contributed substantively to the usage of such verbs within the field of applied linguistics. Similar significant difference was also obtained for the mean difference between the English chemistry corpus and Indonesian chemistry corpus, $\text{Mann-Whitney } U = 196.00, n1 = n2 = 26, p < 0.05, r = 0.36$. These two results indicated that scholars from the same field writing in the two different languages did not use hedging verbs significantly equally frequently in their articles. However, the variable sociocultural context did not
have the same influence or effect on the use of hedging verbs in the two fields, where such variable had larger effect in the field of applied linguistics.

The results of the within-language comparison are as follows: scholars from chemistry and applied linguistics writing in English were not significantly different from each other in terms of their frequency of use of hedging verbs, Mann-Whitney $U = 354.00$, $n_1 = 2 = 26$, $p > 0.05$, indicating that the discipline to which they belong did not have any significant effect on their use of hedging verbs. On the contrary, there was a significant difference between scholars from the two disciplines writing in Indonesian, Mann-Whitney $U = 503.00$, $n_1 = 2 = 26$, $p < 0.05$, $r = 0.43$, which indicated that scholars from the field of chemistry tended to use hedging verbs significantly more frequently in their Indonesian articles, relative to their colleagues working in the discipline of applied linguistics (chemistry mean rank 32.85 and applied linguistics mean rank 20.15, see also Table 5.14). However, the effect of the discipline was small to medium, meaning that the difference found was not to be attributed largely to the discipline factor.

5.6.1.4 Nouns

Of all hedging markers identified in the entire English corpus (the two fields combined), as has been noted before, 79 (3%) took the form of noun. This total figure was composed of 62 hedging nouns from the applied linguistics corpus (accounting for 3.43% of all hedges in the corpus, or 2.38% of the total hedges found in the entire corpus) and 17 nouns from the chemistry corpus (accounting for 2.13% of all hedges in the corpus, or 0.65% of the total hedges found in the entire corpus). The Indonesian entire corpus contained 60 hedging nouns (9.09% of all hedges identified). The Indonesian
applied linguistics corpus contained 28 hedging nouns (accounting for 6.53% of the hedges found in the corpus, or 4.24% of all the hedges found in the entire corpus) and the chemistry corpus contributed 32 nouns (accounting for 13.85% of the hedges found in the corpus, or 4.85% of all the hedges found in the entire corpus). This information is graphically shown in the following figure.

![Graph showing hedging nouns in four corpora across languages](image)

**Figure 5.11** Hedging Nouns in the Four Corpora across Languages

The figure above immediately shows that the patterns of hedging nouns across languages were different. In the entire English corpus smaller proportion of hedging nouns could be found in chemistry. However, the pattern was reversed in the Indonesian corpus, where applied linguistics contained smaller proportion of such nouns, although the difference was not as large as that found in the English corpus. At this point, nothing could be said whether the use of the nouns was higher in one corpus than another, since the data presented so far were not normed data.

The lexical types used as hedging markers in the four corpora were in general of limited variety. On average, a single corpus contained only four lexical types of nouns. In
fact, the English chemistry corpus contained only one lexical type. What is more, unlike adverbs, nouns used as hedges tended to display uniformity in terms of their semantic property, and hence it was not necessary to divide them into categories. Here are examples of usage of hedging nouns in the research articles analyzed in the present study.

[41] Both Ukrainian and Russian are heard on its streets and are used interchangeably at public events, reflecting assumptions that everyone at least understands both languages. (AL)

[42] … the potential for near perfect atom economy makes it an especially desirable methodology. (CH)

[43] Hasil kontak itu menimbulkan dua kemungkinan utama yakni terjadi kesepadan atau kontras. (AL)

(‘The result of the contact engenders two major possibilities namely commensuration or contrast.’)

The mean rate of usage (per 1,000 words) of hedging nouns in the entire English corpus was smaller than that in the entire Indonesian corpus, 0.29 nouns versus 0.58 nouns, respectively. The striking similarity between the two corpora was concerned with the dispersion of the data. That is, the data were equally widely spread out from the mean in both corpora, as indicated by the fact that the standard deviation for both data sets was larger than the mean; English, 0.38 and Indonesian, 1.29. This might be due to the limited number of the markers in the two entire corpora. The descriptive statistics for the four data sets are presented in the following table.
Table 5.16 Descriptive Statistics for Hedging Nouns in the Four Corpora

<table>
<thead>
<tr>
<th>Field</th>
<th>Language</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>applied linguistics</td>
<td>English</td>
<td>26</td>
<td>0.00</td>
<td>1.64</td>
<td>0.37</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.00</td>
<td>0.78</td>
<td>0.19</td>
<td>0.29</td>
</tr>
<tr>
<td>chemistry</td>
<td>English</td>
<td>26</td>
<td>0.00</td>
<td>1.07</td>
<td>0.21</td>
<td>0.34</td>
</tr>
<tr>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.00</td>
<td>6.09</td>
<td>0.98</td>
<td>1.73</td>
</tr>
</tbody>
</table>

The above table (the Minimum column, to be accurate) clearly shows that at least one article in each corpus contained no hedging noun at all. The numbers of such articles from each field and language were as follows: English applied linguistics; 8 (30.8% of the total articles in the corpus); English chemistry, 17 (65.4% of the total articles in the corpus); Indonesian applied linguistics, 16 (61.5% of the total articles in the corpus); and Indonesian chemistry, 17 (65.4% of the total articles in the corpus). In the English chemistry corpus nouns constituted the least popular devices for hedging a proposition. This is also confirmed by the number of lexical types identified in this corpus, as mentioned earlier. All the figures shown in the Maximum column in the above table were in fact outliers. Table 5.15 above also shows that the mean usage of hedging nouns in the English applied linguistics corpus was higher than in the Indonesian applied linguistics corpus. On the other hand, in the field of chemistry the mean usage found the Indonesian corpus was higher than that found in the English corpus. Finally, the magnitudes of the standard deviations (which are higher than the means) for the four data sets indicated wide dispersions of the individual data relative to the mean, which in turn suggested the nature of the data distribution. Indeed, the results of the Kolmogorov-Smirnov test indicated that none of the data sets displayed normal distribution: English applied linguistics, \( D = 0.18, n = 26, p < 0.05 \); English chemistry, \( D = 0.38, n = 26, p < 0.05 \);
Indonesian applied linguistics, D = 0.36, n = 26, \( p < 0.05 \); and Indonesian chemistry, D = 0.37, n = 26, \( p < 0.05 \).

Within-field and within-language comparisons were run using the non-parametric test of Mann-Whitney \( U \) test to examine, respectively, whether scholars from the same field but writing in the two different languages used hedging nouns with significantly different frequencies, and whether scholars writing in the same language but from different fields used hedging nouns at different rates. In addition, between-language comparison was also carried out to determine to what extent English scholars (from both disciplines) and Indonesian scholars (also from the two disciplines) made use of hedging nouns at different rates in their articles. The within-language comparison produced different patterns in the two languages under study. Within the Indonesian language, no significant difference was evident between the scholars working within the two disciplines, Mann-Whitney \( U = 364.50 \), n1 = 2 = 26, \( p > 0.05 \), meaning that the two groups of Indonesian scholars used hedging nouns at comparable rates in their articles, which in turn suggested that the frequency of use of hedging nouns was not affected by the disciplinary field of the writers. As for the English groups of scholars, the picture was different. There was a significant difference between the two groups of scholars, Mann-Whitney \( U = 234.50 \), n1 = 2 = 26, \( p < 0.05 \), \( r = -0.28 \), with those working within the discipline of applied linguistics using hedging nouns more frequently in their articles than their counterparts from chemistry (applied linguistics mean rank 30.48 and chemistry mean rank 22.52, see also Table 5.15 above). This statistical finding indicated that although the two groups of English scholars were different in terms of their use of hedging nouns, such difference, as indicated by the effect size (\( r = -0.28 \)) which was
small, could not be fully attributed to the factor of discipline. In other words, the observed difference between them was not largely engendered by their disciplinary affiliation.

The within-field comparison indicated that there was a significant difference between the two groups of applied linguistics scholars, Mann-Whitney $U = 233.50$, $n_1 = n_2 = 26$, $p < 0.05$, $r = -0.28$. This indicated that the English scholars in applied linguistics used hedging nouns more frequently in their articles than the corresponding Indonesian scholars (English mean rank 30.52 and Indonesian mean rank 22.48, see also Table 5.15 above), although the effect of language variable in this case was relatively small. The two groups of scholars from the field of chemistry, on the other hand, did not use hedging nouns at significantly different rates in their articles, Mann-Whitney $U = 372.00$, $n_1 = n_2 = 26$, $p > 0.05$, which could be taken to mean that there was similarity between the two groups of scholars in terms of their usage of hedging nouns. Put differently, the linguistic medium (i.e. the sociocultural context) in which they wrote their articles did not have any significant effect on the use of their linguistic device. The between-language comparison revealed that there was no significant difference between Indonesian scholars (from the two disciplines) and English scholars (from the same disciplines) in regard to frequency of usage of hedging nouns in their research articles, Mann-Whitney $U = 1,241.00$, $n_1 = n_2 = 52$, $p > 0.05$.

### 5.6.1.5 Adjectives

Earlier in this chapter, it was mentioned that the entire English corpus contained a total of 298 hedging adjectives (both fields combined). This total figure was composed of
193 (64.77%) adjectives gathered from the applied linguistics corpus and 105 (35.23%) adjectives from chemistry corpus. Therefore, a single applied linguistics and chemistry article contained 7.42 and 4.04 adjectives, respectively. Considering the wide difference in size between the two corpora (see previous chapter), an overall difference of only 88 adjectives could be considered to be relatively small.

It has also been mentioned earlier that in the Indonesian corpus hedging adjectives could only be found in the chemistry corpus, and the number was remarkably low; only 10 adjectives were contained in the corpus, accounting for only 1.52% of the total hedges found in the entire corpus. Two lexical types of adjectives were used as hedging markers in this corpus, namely mungkin ‘possible’ (7 tokens) and potensial ‘potential’ (3 tokens). Given the low number of tokens found in the entire Indonesian corpus, no within-field comparison was carried out for hedging adjectives. Therefore, this sub-section was devoted to the analysis of English hedging adjectives only. The following illustrates the use of hedging adjectives in the research articles analyzed in the present study.

[44] A third possible explanation would be to combine the first two explanations as both of these factors may contribute to the pattern observed. (AL)

[45] In a typical procedure, GrubbsB 1st generation catalyst was applied to the steel surface and a mixture of crosslinker in monomer applied to the elastomer. (CH)

[46] Senyawa antibakteri yang terdapat di dalam ekstrak daun kecapi kemungkinan senyawa dioktil heksadioat. (CH)

(‘It is possible that antibacterial compounds contained in the extract of kecapi leaf is dioctilehexadioat’)

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Like in the analysis of adverbs reported on earlier in this chapter, in the analysis of hedging adjectives, too, taxonomy of hedging adjectives was developed based on the semantic structure of the hedges found in the entire English corpus. It is to be noted that the categories included in the taxonomy were not determined prior to the analysis. This was done to avoid forced inclusion of certain categories which might not fit neatly into the predetermined categories. Rather, they emerged from the data themselves. On the basis of close semantic analysis of the individual adjectives, four categories were arrived at, namely apparentness, approximation, generalization, and likelihood. Included in the category of apparentness was the adjective *apparent*. In fact, only this adjective was able to be identified in the entire corpus (both fields). Since the other three categories have been defined before (see the analysis of adverbs above) they do not need to be clarified here.

The composition of the hedging adjectives in the applied linguistics corpus was as follows: apparentness (11 adjectives), likelihood (108 adjectives), approximation (57 adjectives), and generalization (17 adjectives). The corpus of chemistry was composed of the following adjective categories: 49 approximation adjectives, 11 generalization adjectives, 13 apparentness adjectives, and 32 likelihood adjectives. The figures derived from the two corpora were not readily comparable due to the differential corpus sizes. Therefore, the data were further analyzed to arrive at the proportion of each adjective category in the two corpora. The following figure shows such information.
As can be seen from the figure above, the usage of likelihood hedging adjectives in applied linguistics was higher than that in chemistry. By contrast, the usage of the other three categories of hedging adjectives in the chemistry corpus was higher relative to that found in the applied linguistics corpus, although the difference was relatively small for generalization category. It is obvious from the figure above that while likelihood category was dominant in the applied linguistics corpus, in the chemistry corpus it was the second most frequently-used category after approximation.

The data were further analyzed in terms of rate of occurrence per 1,000 of each category in each RA. The following table presents the summary of the relevant data.
Table 5.17 Descriptive Statistics of Data for Hedging Adjectives in English (Per 1,000 Words).

<table>
<thead>
<tr>
<th>Field</th>
<th>Category</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>App. Ling.</td>
<td>Apparentness</td>
<td>26</td>
<td>0.00</td>
<td>0.32</td>
<td>0.06</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td>Approximation</td>
<td>26</td>
<td>0.00</td>
<td>1.27</td>
<td>0.31</td>
<td>0.34</td>
</tr>
<tr>
<td></td>
<td>Generalization</td>
<td>26</td>
<td>0.00</td>
<td>0.55</td>
<td>0.10</td>
<td>0.18</td>
</tr>
<tr>
<td></td>
<td>Likelihood</td>
<td>26</td>
<td>0.00</td>
<td>1.62</td>
<td>0.53</td>
<td>0.49</td>
</tr>
<tr>
<td>Chemistry</td>
<td>Apparentness</td>
<td>26</td>
<td>0.00</td>
<td>0.98</td>
<td>0.12</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>Approximation</td>
<td>26</td>
<td>0.00</td>
<td>2.59</td>
<td>0.51</td>
<td>0.73</td>
</tr>
<tr>
<td></td>
<td>Generalization</td>
<td>26</td>
<td>0.00</td>
<td>0.65</td>
<td>0.12</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>Likelihood</td>
<td>26</td>
<td>0.00</td>
<td>3.10</td>
<td>0.45</td>
<td>0.71</td>
</tr>
</tbody>
</table>

As indicated by the figures shown in the Minimum column, there were a number of articles which did not use adjectives of a certain category to hedge a proposition. In applied linguistics, 18 (69.2%) articles did not contain any apparentness hedging adjective. The number of articles containing no adjective of this category was even higher in chemistry (20 or 76.9% articles). Higher number of articles containing no approximation, generalization and likelihood hedging adjectives was also apparent in chemistry: 12 (34.6%) articles versus 9 (46.2%) articles (for approximation adjectives), 19 (73.1%) articles versus 18 (69.2%) articles (for generalization adjectives), and 12 (46.2%) articles versus 7 (26.9%) articles (for likelihood adjectives). Of all the figures shown in the Maximum column in the table above, only those figures representing applied linguistics apparentness, approximation and likelihood adjectives were not outliers. Comparison of the mean for each category in applied linguistics with the same category in chemistry (e.g. between applied linguistics generalization adjectives and chemistry generalization adjectives) revealed that the means for the categories apparentness, approximation and generalization were somewhat higher in the chemistry corpus. On the other hand, the mean for the likelihood category was higher in the applied linguistics.
linguistics corpus. The table above also suggested something about the dispersion of the data points in each data set. The fact that the standard deviation of each of the categories was larger than its respective mean suggests that the data points were widely dispersed from the mean, which caused the data to be skewed, rather than normally distributed. This is clearly shown by the results of the normality test conducted on the data, as presented in the table below.

Table 5.18 Results of Normality of Distribution Test

<table>
<thead>
<tr>
<th>Field</th>
<th>Adjective Category</th>
<th>Language</th>
<th>Kolmogorov-Smirnov Statistic</th>
<th>df</th>
<th>Sig. (α)</th>
</tr>
</thead>
<tbody>
<tr>
<td>App. Ling.</td>
<td>Apparentness</td>
<td>English</td>
<td>0.421</td>
<td>26</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Approximation</td>
<td>English</td>
<td>0.18</td>
<td>26</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>Likelihood</td>
<td>English</td>
<td>0.15</td>
<td>26</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td>Generalization</td>
<td>English</td>
<td>0.41</td>
<td>26</td>
<td>0.00</td>
</tr>
<tr>
<td>Chemistry</td>
<td>Apparentness</td>
<td>English</td>
<td>0.46</td>
<td>26</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Approximation</td>
<td>English</td>
<td>0.25</td>
<td>26</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Likelihood</td>
<td>English</td>
<td>0.27</td>
<td>26</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Generalization</td>
<td>English</td>
<td>0.44</td>
<td>26</td>
<td>0.00</td>
</tr>
</tbody>
</table>

As can be seen from Table 5.17 above, out of eight data sets only the data for likelihood adjectives in the applied linguistics corpus could be said to be normally distributed. Based on these results, the within-language comparison (carried out only on the English data) was run using Mann-Whitney $U$ test. The results showed that there was no significant difference between the two groups of English scholars in terms of the frequency of use of any of the categories of hedging adjectives: apparentness, Mann-Whitney $U = 335.00$, $n_1 = n_2 = 26$, $p > 0.05$; approximation, Mann-Whitney $U = 346.00$, $n_1 = n_2 = 26$, $p > 0.05$; generalization, Mann-Whitney $U = 335.50$, $n_1 = n_2 = 26$, $p > 0.05$;
and likelihood, Mann-Whitney $U = 269.00$, $n_1 = n_2 = 26$, $p > 0.05$. These statistical findings demonstrated that the two groups of English scholars used the four categories of hedging adjectives at comparable rates, suggesting that there was no apparent effect of discipline on the use of these four categories of adjectives, as far as the two disciplines and the English language were concerned.

### 5.6.2 Boosters

In the entire English corpus (fields combined), there were 1,171 boosters. This total figure was made up of 674 (57.56%) boosters from the applied linguistics corpus and 497 (42.44%) from the chemistry corpus. Recall that the entire English corpus consisted of 52 research articles (26 articles from each of the fields). Therefore, on average a single English article (regardless of whether it was an applied linguistics article or chemistry article) had 22.52 boosters. Separating the two fields, an average of 25.92 and 19.12 boosting markers could be identified in one applied linguistics and one chemistry article, respectively. A total of 1,157 boosters were used in the entire Indonesian corpus, comprising of 995 (86%) boosters from the applied linguistics corpus and 162 (14%) boosters from the chemistry corpus. Since the entire corpus was composed of an equal number of articles from both fields (i.e. 26), an average of 22.25 devices were contained in a single Indonesian article (regardless of field). Separate analysis of the data sets from the two fields revealed that on average 38.27 boosting devices were present in a single applied linguistics article and 6.23 devices in a single chemistry article.
Both major corpora (the entire English and Indonesian corpora) were alike in terms of grammatical categories used to realize boosters. Boosters in both corpora were manifested through the following grammatical categories: noun, adjective, verb, adverb, and modal verb. The following figure shows the proportions of these grammatical categories used to boost propositions in the two major corpora.

![Figure 5.13 Grammatical Categories of Boosters in Both Major Corpora](image)

As can be seen from the figure above, adverbs were predominantly used as boosters in the English corpus, accounting for almost half of the total boosters identified. In the Indonesian corpus, however, there were two dominant grammatical categories used as boosters, namely adverbs and verbs; in fact, the two grammatical categories were used in the Indonesian corpus equally frequently. Modal verbs were more frequently used as boosters in the Indonesian corpus than in the English corpus, although the difference between the two corpora was not quite large. On the other hand, the frequency of adjectives used to boost propositions was higher in the English corpus than in the Indonesian corpus; the English corpus contained boosting adjectives almost three times
as many as found in the Indonesian corpus. Finally, the two corpora were comparable in terms of usage of nouns as boosting markers; in both corpora such grammatical category was the least preferred category to boost propositions.

5.6.2.1 Modal Verbs

It was noted above that the total number of boosters identified in the entire English corpus was 1,171, where 11% of them were in the category of modal verb (see Figure 5.13 above). It was also pointed out that 57.56% (674) of the overall boosters gathered from the entire English corpus came from the applied linguistics corpus. In this academic field, 79 modal verbs functioning as boosters were used, accounting for 11.72% of the overall boosters identified in the entire corpus. In the field of chemistry, out of the 497 boosters identified only 40 boosting modal verbs were able to be identified, which accounted for 8.05% of the total boosters in the corpus. The total number of boosting modal verbs used in the Indonesian applied linguistics corpus was 175, accounting for 17.59% of the total boosters used in the corpus (995), whereas in the chemistry corpus the figure for this grammatical category was 41 which account for 25.31% of the total boosters found (162) in the corpus. The information just mentioned about the usage of boosting modal verbs in the four corpora across the two languages is graphically presented by the following figure.
It is to be reiterated that the figures presented in the above chart were proportions (percentages) to the total number of boosting markers found in the respective corpus, rather than the entire major corpus in the two languages. As can be seen from the figure above, the two fields in the entire Indonesian corpus contained more boosting modal verbs than in the entire English corpus. The figure also shows that more radical difference in the frequency of use of such boosting device was evident in the discipline of chemistry. The difference observed in the field of applied linguistics across the two languages was relatively small. The figure also displays the differential within-language patterns; while the proportion of modal verb usage in the English applied linguistics corpus was somewhat higher than in the English chemistry corpus, the reverse pattern was evident in the Indonesian corpus, that is, the proportion of modal verb usage in chemistry was higher than that observed in applied linguistics. Between-field proportion difference in the Indonesian corpus was higher than that in the English corpus; in the English corpus, the two fields were different by 3.67%, and in the Indonesian corpus the
two fields differed by 7.72%. Examples of usage of boosting modals in the research articles analyzed in the study are presented below.

[47] Participants must download Skype and possess hardware that will allow synchronous voice-based CMC with other participants (e.g. a headset). (AL)

[48] This limitation should not necessarily apply to preformed catalysts … (CH)

[49] Ceritheme ini, merupakan satuan-satuan (unit-unit) kelinguistikan yang akan menunjukkan pola tertentu dan makna yang jelas. (AL)

(‘This ceritheme constitutes linguistic units which will show certain pattern and clear meaning.’)

[50] Air yang mengandung ion klor jika dilewatkan dalam resin penukar anion maka ion klor akan bertukar dengan ion penukar yang terikat pada gugus fungsi resin. (CH)

(‘Water containing chloride ion will exchange with changing ion bound in functional cluster of resin.’)

The mean rate of usage of modal verbs used as boosters per 1,000 words was 1.41 (standard deviation, 1.96) for the entire Indonesian corpus (fields combined) and 0.42 (standard deviation, 0.42) for the entire English corpus (fields combined). The rate of usage of boosting modal verbs per 1,000 words in each of the four corpora is summarized in the following table.
Table 5.19 Descriptive Statistics of Boosting Modal Verbs in the Four Corpora

<table>
<thead>
<tr>
<th>Field</th>
<th>Language</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Linguistics</td>
<td>English</td>
<td>26</td>
<td>0.00</td>
<td>1.60</td>
<td>0.44</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.00</td>
<td>12.66</td>
<td>1.66</td>
<td>2.39</td>
</tr>
<tr>
<td>Chemistry</td>
<td>English</td>
<td>26</td>
<td>0.00</td>
<td>1.30</td>
<td>0.39</td>
<td>0.44</td>
</tr>
<tr>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.00</td>
<td>3.86</td>
<td>1.17</td>
<td>1.41</td>
</tr>
</tbody>
</table>

Table 5.18 above vividly shows some research articles in each discipline and language did not use any modal as a means of boosting propositions. The entire corpus (fields and languages combined) consisted of 31 research articles (27% of the total articles included) with no single modal verb functioning as a booster: four (15.4%) articles from the English applied linguistics corpus, three (11.5%) from the Indonesian applied linguistics corpus, 12 (46.2%) from the English chemistry corpus, and 12 (46.2%) from the Indonesian chemistry corpus. Whereas the maximum figures in the field of applied linguistics in both languages were in fact outliers, those for chemistry in both languages were not. The mean rates of usage of boosting modal verbs in both Indonesian corpora were higher than those found for the corresponding English corpora. Within-language comparison also revealed that in both languages on average an applied linguistics article contained more boosting modal verbs than a chemistry article. Moreover, the mean differences for such within-language comparison were smaller within the English corpus. Finally, the magnitudes of the standard deviations in the four corpora (i.e. the fact that they were larger than the respective means, except for the English applied linguistics corpus) suggested the dispersion of the data points in all the corpora.
The data for the four corpora were subjected to a formal test of normality of distribution. The results of the test were that only the English applied linguistics data set was normally distributed: English applied linguistics, $D = 0.15$, $n = 26$, $p > 0.05$; English chemistry, $D = 0.28$, $n = 26$, $p < 0.05$; Indonesian applied linguistics, $D = 0.28$, $n = 26$, $p < 0.05$; Indonesian chemistry, $D = 0.26$, $n = 26$, $p < 0.05$. The entire English corpus (fields combined) and the entire Indonesian corpus were also submitted to the same normality test. The results of the test were the same, that is, the data for both corpora (fields combined) were not normally distributed: English, $D = 0.16$, $n = 52$, $p < 0.05$ and Indonesian, $D = 0.24$, $n = 52$, $p < 0.05$.

Based on these normality test results, the non-parametric Mann-Whitney $U$ test was used to examine whether (i) the English scholars (fields combined) used modal verbs to boost their propositions at a significantly different rate than the Indonesian scholars (between-language comparison), (ii) the English scholars from both fields used modal verbs at a significantly different rate than the Indonesian scholars from respective fields (within-field comparison) and (iii) the two groups of scholars with the same language background used boosting modals at significantly different rates. The results were as follows. The between-language comparison revealed that there was a significant difference between English scholars and Indonesian scholars in regard to the rate of usage per 1,000 words of boosting modal verbs in their research articles, Mann-Whitney $U = 1,850.50$, $n1 = n2 = 52$, $p < 0.05$, $r = 0.32$. This indicated that the Indonesian scholars did indeed use modal verbs to boost their propositions significantly more frequently than the English scholars (Indonesian mean rank = 62.09 and English mean rank = 42.91; see also Table 5.18 above). However, as indicated by the effect size ($r =$ 0.32).
0.32), the effect of the variable language on the use of boosting modal verbs was medium, suggesting that sociocultural context variable did not largely influence the use of boosting modal verbs in the research articles by English and Indonesian scholars from the disciplines of chemistry and applied linguistics. The within-field comparison showed mixed results. While there was a significant difference between English scholars and their Indonesian counterparts in the field of applied linguistics, Mann-Whitney $U = 537.00$, $n_1 = n_2 = 52$, $p < 0.05$, $r = 0.51$ (English mean rank = 18.85 and Indonesian mean rank = 34.15; see also Table 5.18 above), no significant difference was evident between the English scholars and Indonesian scholars from chemistry, Mann-Whitney $U = 406.00$, $n_1 = n_2 = 52$, $p > 0.05$. Therefore, while the Indonesian scholars from applied linguistics used boosting modal verbs significantly more frequently than the English scholars from the same field, the English and Indonesian scholars from chemistry used such modal verbs equally frequently. These suggested that only within the field of applied linguistics the variable sociocultural context had some effect on the use of boosting modals, and such effect was marginally large ($r = 0.51$). The within-language comparison carried out (to determine whether the two fields from the same language) showed that the two fields were not significantly different from each other in both languages: Indonesian, Mann-Whitney $U = 268.00$, $n_1 = n_2 = 26$, $p > 0.05$; English, Mann-Whitney $U = 289.00$, $n_1 = n_2 = 26$, $p > 0.05$. These two findings suggested that scholars from applied linguistics and chemistry did use boosting modals at comparable rates, which in turn gave an indication that the discipline to which they belong was not a function of their frequency of use of boosting modals, and it was true in both languages.
5.6.2.2 Adverbs

A total of 374 adverbs functioning as boosters were observed in the English applied linguistics corpus. This figure accounted for over half (55.49%) of the total boosters identified in the corpus (674). In the English chemistry corpus, the proportion of the boosting adverbs was smaller, which was 47.48% (236) of the total boosters identified (497). As has been mentioned before, the Indonesian applied linguistics corpus contained 995 boosters. Of this total number, 362 (36.38%) were in the form of adverb. Quite similar proportion of adverbs functioning as boosters was also observed in the Indonesian chemistry corpus. Of the total of 162 boosters identified in the corpus, 34.57% (56) are adverbs. The following figure is the graphical presentation of the aforementioned proportions of adverbs functioning as boosters found in the four corpora under study.

![Figure 5.15](image_url)

**Figure 5.15** Proportions of Adverbs as Boosters in the Four Corpora
It is interesting to note the similarity of patterns found across the fields in each language. As shown by the above figure, in both languages the proportion of adverbs as boosters was larger in applied linguistics than in chemistry, although the difference in proportions found in the Indonesian corpus was somewhat smaller. The following sentences illustrate the use of boosting adverbs in the research articles analyzed the present study.

[51]  *Sela obviously had one in mind since she immediately launches into a story about such a case* (line 27) … (AL)

[52]  *These complete digests described by Daas and coworkers clearly show that the pectins did not have a random intramolecular distribution* … (CH)

[53]  *Pergeseran bahasa dapat terjadi bila suatu komunitas secara kolektif meninggalkan bahasa sepenuhnya dan memilih bahasa lain.* (AL)

   (‘Language change can happen if a community collectively leaves the language completely and chooses another language.’)

[54]  *Logam berat merupakan polutan kedua, setelah pestisida, yang dikenal sebagai polutan yang sangat berbahaya dan sangat beracun.* (CH)

   (‘Copper is the second pollutant, after pesticide, known as very dangerous pollutant and very toxic.’)

The mean number of adverbs functioning as boosters for the English corpus (fields combined) was 2.24 (standard deviation, 1.44) and the mean number for the Indonesian corpus was 2.73 (standard deviation, 2.50). The means for all four corpora were also separately computed, and the following table presents the information.
Table 5.20 Descriptive Statistics for Boosting Adverbs across Fields and Languages

<table>
<thead>
<tr>
<th>Field</th>
<th>Language</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Linguistics</td>
<td>English</td>
<td>26</td>
<td>0.24</td>
<td>3.93</td>
<td>2.09</td>
<td>0.91</td>
</tr>
<tr>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.32</td>
<td>10.40</td>
<td>3.64</td>
<td>2.41</td>
</tr>
<tr>
<td>Chemistry</td>
<td>English</td>
<td>26</td>
<td>0.00</td>
<td>6.40</td>
<td>2.39</td>
<td>1.82</td>
</tr>
<tr>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.00</td>
<td>7.71</td>
<td>1.81</td>
<td>2.29</td>
</tr>
</tbody>
</table>

The table clearly shows that while the articles in the applied linguistics corpus in both languages contained at least one boosting adverb, not all articles in the other field in both languages had such adverbs. There was one (3.8%) English chemistry article within which no single boosting adverb could be identified. The number of articles containing no boosting adverb was larger in the corresponding Indonesian corpus (10 (38.5%) articles). Surprisingly, the figure 10.40 shown in the above table for the Maximum number of adverbs found in the Indonesian applied linguistics corpus was not an outlier, although, as can be seen from the table, such figure was extremely far from the mean for the corpus. In fact, only one figure presented in the table above was an outlier, namely that for the Indonesian chemistry. The table also reveals that there were differential patterns across the two languages. That is, while the mean for the English applied linguistics corpus was slightly smaller than that for the corresponding English chemistry corpus, in the Indonesian corpus it was the former which had larger mean. The figures in Standard Deviation column in the above table indicated that the group of scholars from the discipline of English applied linguistics was the most uniform in terms of usage of boosting adverbs. This was suggested by the smallest proportion of the standard deviation to the mean. On the other hand, the Indonesian chemistry corpus displayed the least
uniformity among the scholars in such group in terms of usage of boosting adverbs. Generally speaking, for the other two groups for scholars from the two disciplines (Indonesian applied linguistics and English chemistry) the degree of the uniformity in terms of usage of such adverbs was relatively similar.

Kolmogorov-Smirnov test of normality of distribution was run twice, first for the two major corpora (i.e. English and Indonesian with fields combined) and second for each of the four corpus. The results of the test were that not all data sets were normally distributed. Only the data sets for the English corpus were found to be normally distributed: English applied linguistics, $D = 0.11, n = 26, p > 0.05$; Indonesian applied linguistics, $D = 0.21, n = 26, p < 0.05$; English chemistry, $D = 0.13, n = 26, p > 0.05$; and Indonesian chemistry, $D = 0.21, n = 26, p < 0.05$. When run on the entire corpora of the two languages (fields combined) the test showed similar results. That is, only English data set was found to be normally distributed: English, $D = 0.12, n = 52, p > 0.05$; Indonesian, $D = 0.17, n = 52, p < 0.05$.

Using the non-parametric test for comparing two groups (Mann-Whitney $U$ test), it was found that there was no significant difference in the use of boosting adverbs in the two major corpora (English and Indonesian corpora with fields being combined), Mann-Whitney $U = 1,377.50, n1 = n2 = 52, p > 0.05$, meaning that Indonesian scholars from both fields used boosting adverbs equally frequently as the English scholars in their articles. In other words, the variable language did not exhibit visible effect on the usage of boosting verbs. The results of the within-field comparison were that the mean difference between the English and Indonesian applied linguistics corpus was statistically significant, whereas that observed between the English and Indonesian chemistry corpora
was not: applied linguistics, Mann-Whitney $U = 473.00$, $n_1 = n_2 = 26$, $p < 0.05$, $r = 0.34$

(English mean rank = 21.31 and Indonesian mean rank = 31.69, see also Table 5.18 above) and chemistry, Mann-Whitney $U = 238.00$, $n_1 = n_2 = 26$, $p > 0.05$ (English mean rank = 30.35 and Indonesian mean rank = 22.65, see also Table 5.18 above). It was quite obvious then that while the Indonesian scholars from applied linguistics use boosting adverbs significantly more frequently than the English scholars from the same field (with the effect of language here being medium), the two groups of chemistry scholars from the two languages did not seem to use the adverbs at significantly different rates. In other words, in the field of chemistry the effect of the variable sociocultural context was absent. Differential findings were also observed from the application of the within-language comparison (carried out to examine whether the two fields within the same language are different from each other). Significant difference is evident in the frequency of use of boosting adverbs by the Indonesian scholars from the two fields, Mann-Whitney $U = 158.50$, $n_1 = n_2 = 26$, $p < 0.05$, $r = -0.46$. This indicated that Indonesian scholars from the field of applied linguistics used boosting adverbs significantly more frequently than those from the field of chemistry (applied linguistics mean rank 33.40 and chemistry mean rank 19.60, see also Table 18 above), with the effect of discipline being medium to large. On the other hand, the two groups of English scholars were not significantly different from each other, Mann-Whitney $U = 349.00$, $n_1 = n_2 = 26$, $p > 0.05$, suggesting that they used boosting adverbs equally frequently in their articles. Thus, within the English language, the variable discipline did not have sufficient effect on the use of linguistic features.
5.6.2.3 Verbs

The total number of boosters found in the English applied linguistics corpus, as has been mentioned earlier, was 674, of which 94 (13.95%) were in the form of verb. Out of the total 500 boosters found in the English chemistry corpus, 100 (20%) were verbs. In the Indonesian applied linguistics corpus, the proportion of verbs functioning as boosters to the total boosters found was 34.97% (348 verbs) of the total boosters found in the corpus (995). Finally, a total of 65 verbs as boosters were identified in the Indonesian chemistry corpus, accounting for 40.12% of the total 162 verbs found. This information is presented in the following figure.

![Bar chart showing the proportion of verbs as boosters in English and Indonesian corpora](image)

**Figure 5.16** Verbs as Boosters in the Four Corpora

Obviously, in both languages the chemistry corpus contained more boosters realized through verbs. Interestingly, the proportional difference between the two fields was almost the same across the two languages. Another obvious pattern was that in both fields the Indonesian corpora contained more boosting verbs, again with the proportional
difference being almost the same across the two fields. Examples of the use of boosting verbs found the analyzed articles are given below.

[55] *A post hoc review of the students’ scripts revealed a higher article overuse …* (AL)

[56] *We believe that Ni(l) is also the active catalyst in our case since …* (CH)

[57] *WEBK mempunyai unsur partisipan yang menunjukkan ideological complexes yaitu ada kekuasaan (power) dan solidaritas dalam aktivitasnya.* (AL)

(‘WEBK has participant element which shows ideological complexes consisting of power (power) and solidarity in its activity.)

[58] *Metileugenol telah dikenal sebagai salah satu senyawa kimia alami yang bersifat sebagai penarik (attractant) terhadap lalat buah jantan …* (CH)

(‘Metileugenol has been known as one of natural chemical compounds which has the characteristic as attractant for male fruit flies …’)

The average number of verbs functioning as boosters found in a single article for the entire English corpus (both fields combined) was 0.86 per 1,000 words (standard deviation, 0.84), whereas for the entire Indonesian corpus (both fields combined) it was 2.65 per 1,000 words (standard deviation, 2.73). The means and standard deviations for each of the four corpora were also computed which were subsequently used as the basis for both within-language and within-field comparison analyses. The following table provides information about such means and standard deviations.
Table 5.21 Descriptive Statistics of the Boosting Verbs across Fields and Languages

<table>
<thead>
<tr>
<th>Field</th>
<th>Language</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Linguistics</td>
<td>English</td>
<td>26</td>
<td>0.00</td>
<td>1.66</td>
<td>0.55</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.27</td>
<td>9.82</td>
<td>3.08</td>
<td>2.39</td>
</tr>
<tr>
<td>Chemistry</td>
<td>English</td>
<td>26</td>
<td>0.00</td>
<td>3.85</td>
<td>1.16</td>
<td>0.99</td>
</tr>
<tr>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.00</td>
<td>14.15</td>
<td>2.22</td>
<td>3.03</td>
</tr>
</tbody>
</table>

Table 5.19 above shows that at least one article in the English applied linguistics as well as in the English and Indonesian chemistry corpora contained no boosting verb at all. Manual inspection of the data revealed that five articles (19.2% of the total articles included) in the English applied linguistics corpus did not have any boosting verb. For the English and Indonesian chemistry corpora, there were five articles (19.2% of the total articles included) and six (23.1% of the total articles in the corpus), respectively, having no such verb. The maximum number of boosting verbs found in each of the two Indonesian corpora as shown in the table above turned out to be outliers, while those for the two English corpora were not. The table also indicates that the data points for the English applied linguistics and Indonesian chemistry were more dispersed than those for the English chemistry and Indonesian applied linguistics. This was clearly indicated by the magnitude of the standard deviation relative to the mean.

Prior to the inferential statistical analysis, the data were submitted to the Kolmogorov-Smirnov test of normality to determine whether their distribution was normal. The test was run twice, first for the major corpora (the entire English and Indonesian corpus) and second for each of the four corpora. The results of the test were as follows: the data for both major corpora were not normally distributed (English, $D =$
0.17, n = 52, p < 0.05; Indonesian, D = 0.17, n = 52, p < 0.05). The results of the test run on the data for the four corpora showed that while the data sets for the English corpus had normal distribution, those for the Indonesian corpus did not (English applied linguistics, D = 0.16, n = 26, p > 0.05; English chemistry, D = 0.14, n = 26, p > 0.05; Indonesian applied linguistics, D = 0.19, n = 26, p < 0.05; Indonesian chemistry, D = 0.23, n = 26, p < 0.05).

Based on the above-mentioned results of the normality test, the non-parametric test for comparing two groups (Mann-Whitney U test) was used to answer the questions of (i) whether the English scholars from both fields used boosting verbs at a significantly different rate from the Indonesian scholars (between-language comparison), (ii) whether English scholars from each of the two fields used boosting verbs at a significantly different rate from the Indonesian scholars from the respective fields (within-field comparison) and (iii) whether the two fields from the same language used boosting verbs at significantly different rates (within-language comparison). The between-language comparison revealed that there was a significant difference between the means for the entire English corpus and entire Indonesian corpus, Mann-Whitney U = 2,013.50, n1 = n2 = 52, p < 0.005, r = 0.42 (English mean rank = 39.78 and Indonesian mean rank = 65.22), meaning that the Indonesian scholars used boosting verbs significantly more frequently than the English scholars, which in turn suggested that the variable language had some effect on the usage of boosting verbs, where such effect was medium. Mixed results were obtained from the within-field comparison analysis. There was a significant difference between the means for the English and Indonesian scholars from applied linguistics, Mann-Whitney U = 618.50, n1 = n2 = 26, p < 0.05, r = 0.71. The Indonesian scholars
used significantly more boosting verbs in their articles (mean rank = 37.29) than the English scholars did (mean rank = 15.71) (see also Table 5.19 above). By contrast, no significant difference was observed between the means for scholars from chemistry across the two languages, Mann-Whitney $U = 395.00$, $n_1 = n_2 = 26$, $p > 0.05$, indicating that the two groups of chemistry scholars with different language backgrounds used the verbs equally frequently in their article. Finally, the within-language comparison showed that for both languages there was a significant difference between the two fields: Indonesian, Mann-Whitney $U = 225.00$, $n_1 = n_2 = 26$, $p < 0.05$, $r = -0.29$; English, Mann-Whitney $U = 458.50$, $n_1 = n_2 = 26$, $p < 0.05$, $r = 0.31$. These findings indicated that the two groups of scholars writing in the same language, that is within the same sociocultural context (e.g. English chemistry scholars vs. English applied linguistics scholars) from both languages did not use boosting verbs at comparable rates in their articles. In other words, the discipline to which they belong influences their rate of use of the verbs, although the size of the effect in Indonesian and English was not substantive. Despite such similarity, the nature of the significant difference evident in the two languages was not the same. That is, whereas English chemistry scholars used boosting verbs more frequently than their colleagues from applied linguistics (chemistry mean rank 31.13 and applied linguistics mean rank 21.87, see also Table 19), in the Indonesian group it was the latter who used the boosting devices more frequently than the former (applied linguistics mean rank 30.85 and chemistry mean rank 22.15, see also Table 5.19 above).
5.6.2.4 Adjectives

The number of adjectives used as boosters in the English applied linguistics corpus was comparable to that of verbs in the same corpus. Out of the total 674 boosters identified in the corpus, 89 (13.20%) were of the category of adjective. This meant that on average a single English applied linguistics article contained 3.42 boosting adjectives. In this corpus, adjectives constituted the third most-frequently used category, after adverb and verb. In the English chemistry corpus, a total of 115 boosting adjectives were used, accounting for 23% of the overall boosters identified in the corpus (500). With such proportion, such category was the second most frequently-used grammatical category to boost proportions in this corpus after adverb. The total number of boosters found in the Indonesian applied linguistics corpus was 995, of which 84 (8.44%) were adjectives. This grammatical category was not very popular as a means of boosting propositions in this corpus. This was indicated by the fact that the grammatical category was the fourth most frequently-used category, right before noun (which was the least frequently-used category). The last corpus to be described here, Indonesian chemistry, was rather unique in the sense that it did not contain any adjective used as a booster. The different proportions of adjectives in the four corpora just mentioned can be seen in the following figure.
The obvious difference between the English and Indonesian corpora, as can be seen clearly from the above figure, was that while in the former corpus larger proportion of adjectives used as boosters was evident in chemistry in the latter corpus it was applied linguistics which contained larger proportion. Another noticeable pattern shown by the above figure was that in both fields the English corpora made use of such adjectives more frequently than the Indonesian corpus. Below are examples of usage of boosting adjectives found in the analyzed articles.

[59] … the four registers exhibit clear preferences for different 4-word clusters. (AL)

[60] … it is evident that only very minor quantities of Mo(CO)6 (e.g., Mo:Ru=0.06) were necessary to initiate synergistic effects. (CH)

[61] … pemilihan tema topik yang tidak bertanda (unmarked topical themes) (saya dan Kapolres) membawa pesan jelas bahwa ada dua orang yang terlibat dalam konflik. (AL)
(“… the choice of unmarked topical themes (unmarked topical themes) (I and Police Chief) carries a clear message that there are two people involved in the conflict.’)

The mean number of boosting adjectives found in a single article in the entire English corpus (fields combined) was 0.83 per 1,000 words and the standard deviation was 0.85. For the Indonesian corpus (fields combined) the mean was 0.88 per 1,000 words and the standard deviation is 0.70. The means and standard deviations for the four corpora are shown in the following table.

<table>
<thead>
<tr>
<th>Field</th>
<th>Language</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Linguistics</td>
<td>English</td>
<td>26</td>
<td>0.00</td>
<td>1.60</td>
<td>0.50</td>
<td>0.52</td>
</tr>
<tr>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.00</td>
<td>2.63</td>
<td>0.88</td>
<td>0.70</td>
</tr>
<tr>
<td>Chemistry</td>
<td>English</td>
<td>26</td>
<td>0.00</td>
<td>3.85</td>
<td>1.16</td>
<td>0.99</td>
</tr>
<tr>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

In each of the four corpora, there was obviously at least one article which did not contain any boosting adjective at all (see the Minimum column in the table above). In fact, no single boosting adjective was present in the Indonesian chemistry corpus. The number of articles with no boosting adjectives in the other three of the four corpora was as follows: English applied linguistics, seven (26.90%); English chemistry, five (19.2%); Indonesian applied linguistics, three (11.50). None of the three Maximum figures in the table above was an outlier. The above table also shows that the Indonesian applied linguistics corpus had a larger mean usage of the adjectives per 1,000 words than that of the corresponding English corpus. The fact that the mean for the English chemistry corpus was larger than
that for the corresponding Indonesian chemistry corpus was hardly worth mentioning, since the latter corpus did not contain any single adjective functioning as a booster. The magnitudes of the standard deviations for the four corpora relative to the respective means were suggestive of the dispersion of the data points. The three data sets were characterized by wide dispersion of the individual data making up the data sets. This might be due to the small number of cases observed in the three data sets.

The Kolmogorov-Smirnov test of normality run on the data sets indicated that the two major data sets (the entire English and Indonesian corpora, fields combined) were not similar in terms of their distribution; while the English data set did not pass the normality test, D = 0.17, n = 52, p < 0.05, the Indonesian data set does, D = 0.11, n = 52, p > 0.05. The formal test indicated that the data for the Indonesian applied linguistics and the English chemistry corpus were normally distributed: English applied linguistics, D = 0.22, n = 26, p < 0.05, Indonesian applied Linguistics, D = 0.11, n = 26, p > 0.05, English Chemistry, D = 0.14, n = 26, p > 0.05.

Given the nature of the distribution of the data, the non-parametric test for comparing two groups (Mann-Whitney U test) was used to analyze the data. The result of the test run on the two major corpora (English and Indonesian, fields combined) was that there was no significant difference in the mean for the two corpora, Mann-Whitney U = 741.50, n1 = n2 = 52, p > 0.05, meaning that the two groups of scholars used boosting adjectives at comparable rates, or in other words, the variable sociocultural context did not have sufficient effect on the use of such boosting markers. However, this result might be caused by the fact that the Indonesian chemistry data were missing. Therefore, the next analytical stage was to see whether this was indeed the case by conducting a within-
field comparison which was focused solely on the field of applied linguistics. It turned out that such significant difference between the two major corpora was indeed the byproduct of the fact that the Indonesian chemistry corpus did not contain any single adjective used as a booster. The result of the within-field comparison was that there was a significant difference between the mean for the English applied linguistics and that for the Indonesian applied linguistics, Mann-Whitney $U = 452.00$, $n1 = n2 = 26$, $p < 0.05$, $r = 0.29$ (English mean rank = 22.12 and Indonesian mean rank = 30.88; see also Table 5.15). Here it is obvious that the Indonesian applied linguists did in fact use boosting adjectives significantly more frequently than the English applied linguists. Although it can be seen here that the variable sociocultural context did have an effect on the usage of boosting adjectives, such effect was marginally medium. Since Indonesian chemistry corpus did not have any boosting adjective, the within-language comparison was run only on the English corpus. The result of the test shows that there was a significant difference between the two groups of English scholars, with those belonging to the discipline of chemistry using the markers significantly more frequently than their counterparts from the discipline of applied linguistics, Mann-Whitney $U = 470.00$, $n1 = n2 = 26$, $p < 0.05$, $r = 0.34$ (applied linguistics mean rank = 22.12 and chemistry mean rank = 30.88; see also Table 5.15). As indicated by the magnitude of the effect observed ($r = 0.34$), the discipline within which they worked only had a medium effect on the use of boosting adjectives. In short, it could be argued that both variables sociocultural context and discipline did not play a significant role in the usage of boosting adjectives in research articles by the two groups of scholars.
5.6.2.5 Nouns

As shown by Figure 5.13, noun was the least popular grammatical category used to boost propositions. This was true of not only the English corpus (both fields combined), but also the Indonesian corpus. Such grammatical category represented only 4% and 2% of the total boosters found in the English and Indonesian corpora, respectively. The English applied linguistics corpus contained only 38 nouns functioning as boosters, which accounted for only 5.64% of the total boosters found (674 tokens). The total 38 boosting nouns found in this English corpus resulted from the deployment of only a single lexical type, namely fact. The same lexical type was also the only noun used as a booster found in the English chemistry corpus, but the proportion in this latter corpus was even smaller. A total of six boosting nouns (out of the total 500 boosters) were able to be identified in the corpus. As such, the category of nouns represented negligible 1.2% of the total boosters identified in the corpus. Out of the total 995 boosters found in the Indonesian applied linguistics corpus, only 26 of them were nouns, accounting for only 2.61%. Three lexical types of nouns produced this total figure in this corpus, namely bukti ‘evidence,’ fakta ‘fact,’ and kenyataan ‘reality.’ As in the case of usage of adjectives to boost propositions mentioned in the preceding sub-section, nouns as boosters were also completely absent from the Indonesian chemistry corpus. To summarize, comparing the English and Indonesian corpora it was evident that the English applied linguistics contained more boosting nouns than the corresponding Indonesian corpus, as far as raw frequencies are concerned. The same was also true of the field of chemistry. In both major corpora (English and Indonesian), applied linguistics outperformed the other field, as far as usage of boosting nouns was concerned. The
aforementioned information on the usage of boosting nouns can be seen in the following figure.

![Figure 5.18 Boosting Nouns in the Four Corpora](image)

The following sentences provide examples of usage of boosting nouns in the analyzed research articles.

[62] *In all cases alpha was set at .017 (Bonferroni adjustment) to account for the fact that multiple comparisons of the same data were made.* (AL)

[63] *The fact that the yield of insoluble precipitate after acidification was greater than the percentage of apparent amylose in the starch sample indicates that some amylopectin was precipitated along with the amylose complex...* (CH)

[64] *Fakta lingual ini terjadi karena verba dan nomina merupakan kontentif.* (AL)

(‘This linguistic fact occurs because verbs and nouns are contentive.’)

Comparing the two major corpora (English and Indonesian, with the two fields combined), it was evident that the mean for the Indonesian corpus was twice as large as
the mean for the English corpus, (English, 0.14 per 1,000 words versus Indonesian, 0.28 per 1,000 words). The standard deviations for the English and Indonesian major corpora were 0.20 per 1,000 words and 0.39 per 1,000 words, suggesting that the data points in the two corpora had equal dispersion. The table below presents the descriptive statistics of the four corpora.

**Table 5.23** Descriptive Statistics of the Boosting Nouns for the Four Corpora

<table>
<thead>
<tr>
<th>Field</th>
<th>Language</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Linguistics</td>
<td>English</td>
<td>26</td>
<td>0.00</td>
<td>0.85</td>
<td>0.22</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.00</td>
<td>1.66</td>
<td>0.28</td>
<td>0.39</td>
</tr>
<tr>
<td>Chemistry</td>
<td>English</td>
<td>26</td>
<td>0.00</td>
<td>0.49</td>
<td>0.06</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td>Indonesian</td>
<td>26</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

The number of articles containing no boosting noun in each of the four corpora was considerable: English applied linguistics, 7 (26.9%); English chemistry, 21 (80.8%); Indonesian applied linguistics, 13 (50%); and Indonesian chemistry, 26 (100%). The maximum figures shown in the above table were all outliers. Surprisingly, all the data for the English chemistry (from five articles) were in fact outliers.

The Kolmogorov-Smirnov test of normality provided evidence of the non-normal distribution of the data sets: English applied linguistics, $D = 0.20$, $n = 26$, $p < 0.05$; English chemistry, $D = 0.48$, $n = 26$, $p < 0.05$ and Indonesian applied linguistics, $D = 0.26$, $n = 26$, $p < 0.05$. The same test was also run on the data for the two major corpora (English and Indonesian, with the two fields combined), and the results were the same, that is both data sets were not normally distributed: English, $D = 0.30$, $n = 52$, $p < 0.05$ and Indonesian $D = 0.26$, $n = 52$, $p < 0.05$. 

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Given the results of the normality test, non-parametric test for comparing two groups (Mann-Whitney U test) was conducted in a series of comparisons. The first comparison, between-language, determines if the two major corpora were significantly different in terms of their usage of boosting nouns. It showed that there was no significant difference between the mean for the English corpus and that for the Indonesian corpus, Mann-Whitney $U = 787.50$, $n_1 = n_2 = 52$, $p > 0.05$. This indicated that the English and Indonesian scholars (fields combined) used boosting nouns equally frequently in their articles, and that sociocultural context variable does not have sufficient effect on the use of boosting nouns. The second comparison, within-field comparison, was conducted on the applied linguistics data only to examine whether the two groups of scholars (English and Indonesian) used boosting nouns at significantly different rates in their articles. This comparison yielded the result that there was no significant difference between the two languages, Mann-Whitney $U = 328$, $n_1 = n_2 = 26$, $p > 0.05$, meaning that the English and Indonesian scholars from applied linguistics used boosting nouns equally frequently in their articles. The variable sociocultural context in this field, too, did not have sufficient effect on the use of boosting nouns. No within-discipline comparison was conducted on the chemistry data, since Indonesian chemistry corpus did not have any boosting nouns. Finally, within-language comparison was conducted only on the data for the English corpora (chemistry and applied linguistics). The statistical finding revealed that there was a significant difference between the two groups of English scholars, and that those working within the applied linguistics field used more boosting nouns than those working within the discipline of chemistry, Mann-Whitney $U = 166.50$, $n_1 = n_2 = 26$, $p < 0.05$, $r = -0.47$ (applied linguistics mean rank = 33.10 and chemistry mean rank = 19.90; see also
Table 5.15). The effect size ($r = -0.47$) suggested that discipline did have a medium-to-large effect on the use of boosting nouns.

### 5.7 Summary of Findings

The cross-linguistic findings of the present dissertation study can be summarized as follows: (1) collectively English scholars from the two fields of chemistry and applied linguistics used hedges in their research articles significantly more frequently than Indonesian scholars, but boosters were used by the latter group significantly more frequently than the former group; (2) while English scholars from the field of applied linguistics used hedges significantly more frequently than Indonesian scholars from the same field, the two groups of chemistry scholars (English and Indonesian) were not different in this regard; (3) Indonesian scholars from the two disciplines used boosters significantly more frequently than their respective English disciplinary colleagues; (4) in the two disciplines English scholars consistently used significantly more hedging modal *may* than Indonesian scholars; with the exception of likelihood adverbs, English and Indonesian scholars from the two disciplines were comparable in terms of their use of hedging adverbs; (5) English scholars from the two disciplines used hedging verbs and nouns significantly more frequently their Indonesian counterparts; (6) Indonesian scholars from linguistics used boosting modals, adverbs, verbs, adjectives significantly more frequently than their English disciplinary colleagues, but the two groups of scholars were not different in terms of their use of boosting nouns; (7) English and Indonesian chemistry scholars used boosting modals and verbs at comparable rates, although the
former group of scholars used boosting adverbs significantly more frequently than the latter group.

The cross-disciplinary findings were as follows: (1) English applied linguistics and chemistry scholars used hedges at comparable rates, but the former group used boosters significantly more frequently than the latter; (2) Indonesian chemistry scholars used hedges significantly more frequently but used boosters significantly less frequently than their Indonesian colleagues from applied linguistics; (3) applied linguistics scholars writing in English used hedging may significantly more frequently than their colleagues from chemistry, yet those writing in Indonesian used the feature at comparable rate as their colleagues from chemistry; (4) Indonesian scholars from applied linguistics used approximation hedging adverbs comparably frequently as their colleagues from chemistry, but the former group used generalization and likelihood adverbs significantly more frequently than the latter group; (5) English scholars from the two fields were comparable in terms of their frequency of use of approximation and likelihood hedging adverbs, verbs and adjectives (all categories), but scholars from applied linguistics used generalization hedging adverbs and nouns significantly more frequently than their English colleagues from chemistry; (6) English scholars from applied linguistics and chemistry used boosting modals and adverbs at comparable rates; (7) boosting verbs and adjectives were used significantly more frequently by English chemistry scholars than by their English colleagues from applied linguistics, yet the latter group used boosting nouns significantly more frequently than the former group; (8) Indonesian applied linguistics scholars used boosting verbs and adverbs significantly more frequently than Indonesian
chemistry scholars, but the two groups of scholars were comparable in terms of their frequency of use of boosting modals.
Chapter 6 Factors Influencing Rhetorical Features

6.1 Introduction

It is to be reiterated that the main purpose of the present study was to examine whether Indonesian and English native speaker scholars used hedges and boosters in their research articles at different frequency rates. The theoretical aim of the study was to examine whether sociocultural context and discipline constituted the sole determinant factor influencing the rhetorical features of research articles. To this end, research articles from two disciplines (chemistry and applied linguistics) written in English and Indonesian by the respective native speaker scholars were quantitatively analyzed in terms of their frequency of use of hedges and boosters.

Generally, as has been described in the preceding chapter, English native speaker scholars used more hedges in their English research articles than Indonesian native speaker scholars, although there was no difference between English and Indonesian chemistry scholars in terms of frequency of hedging use (But they were significantly different in terms of usage of hedging may, and the difference was considerable as shown by the magnitude of the effect size). Indonesian scholars, on the other hand, used more boosters in their research articles than English scholars. This held true for scholars from the two disciplines. The findings for hedging use indicated that, with the exception of English chemistry scholars, English scholars were more cautious in presenting their claims than Indonesian scholars. In other words, the claims presented by English scholars had higher degree of uncertainty compared to those promoted by Indonesian scholars.
This follows that, as more strongly indicated by the findings for boosting use, Indonesian scholars were more confident in their presentation of their claims.

The findings of the present study were consistent with those of previous studies. Hu and Cao (2011) reported a study which showed that applied linguistics article abstracts written in English contained significantly more hedges than those written in Chinese, and the latter set of abstracts made use of boosters significantly more frequently than the former set of abstracts. The study conducted by Zarei and Mansoori (2011b) had also produced findings which showed that Iranian computer engineering scholars used boosters significantly more frequently in their Persian research articles than English scholars from the same field in their English articles, yet the latter group of scholars used hedges significantly more frequently, findings which corroborated a previously conducted comparative study of Persian and English research articles from six disciplines (sociology, education, psychology, physics, chemistry, and medicine). Similarly, Koutsantoni (2005a) reported that Greek scholars from electronic, electrical and chemical engineering fields used boosters more frequently than their English disciplinary colleagues. Vassileva (2001) showed that English linguistics research articles contained more hedges than Bulgarian linguistics research articles, and boosters were used more frequently in the latter set of articles than in the former set. Grossmann and Wirth (2008) reported that French scholars from economics, linguistics and medicine used boosters more frequently than English scholars from the same field.

The findings of the present dissertation study (along with the findings of other studies just mentioned), generally speaking, substantiated Hyland’s (2011a, p. 181) contention that “compared with many languages English academic writing tends to be
more cautious in making claims, with considerable use of mitigation and hedging.” This does not necessarily mean that research articles written in English are always more cautious in making claims than those written in any other language. Vold (2006b), for example, showed that research articles written in English and those written in Norwegian were comparable in terms of their frequency of use of hedges. Likewise, Sultan’s (2011) study also found that Arabic linguistics research articles contained more hedges and boosters than English ones. As such, these two studies provided empirical evidence which is not fully consistent with the present study, although Sultan’s study findings are to some extent in agreement with the findings of the present study. Based on the findings of these two studies, especially Vold’s study, it might be that English research articles are in fact not always cautious in making claims, as suggested by Hyland above. But this surely needs to be further validated through empirical investigation into the matter.

6.2 Social Cultural Factors

The intriguing question now is why Indonesian research articles contained more boosters than English research articles, or to put it differently why Indonesian scholars (at least from the two disciplines under study) were more confident in presenting their claims than their English counterparts. Do aspects of sociocultural context solely determine the frequency of use of hedges and boosters in research articles? Confronted with the same question, researchers typically resorted to social factors such as size of the expected readership, degree of homogeneity of readership and cultural characteristics as the sole determinants of rhetorical difference observed. This might be motivated by the widely-held view of genre as situated entity (Tardy, 2011). As Connor cogently put it, “writing is
increasingly regarded as being socially situated; each situation may entail special consideration to audience, purposes, level of perfection, and correspondingly may require varying amounts of revision, collaboration, and attention to detail” (2004, p. 293). The assumption was that “in order to arrive at an explanation of why texts the way they are, it is necessary to draw on the social contexts where they occur” (Mauranen, 2001, p. 45). In the following three sections, the three social-cultural factors mentioned above are discussed in light of the findings of the present dissertation study. That is, the discussion focuses solely on the issue of whether the social factors predominantly determine the use of hedging and boosting in research articles.

6.2.1 Size of Readership

On the assumption that all other things are equal between English and Indonesian scholars, the two groups of scholars were in fact different in one obvious aspect, namely the characteristic of the readership being addressed. More particularly, the sizes of the scholarly community being addressed by the two groups of scholars were obviously different. Needless to say, Indonesian scholars (using Indonesian language and publishing in local journals) communicated their research findings with their fellow Indonesian academics (from the respective disciplines) only, while English scholars (by virtue of the international status of the journals in which they publish) had to address a much wider academic community. Previous researchers (see Review of Studies Chapter) argued that the smaller the size of the community, the better the members know each other, which in turn leads to stronger solidarity which can be gained among the members in question. It is true that boosters are markers of solidarity (Hyland, 2005a, 2005b). For Indonesian
scholars, one might argue, expressing scientific claims with great certainty could be considered as a safe rhetorical behavior. For English scholars, however, using the rhetorical behavior as their Indonesian counterparts did might be at risk, as much more scholars were involved in the scientific communication. Assuming solidarity on the part of the English scholars was not possible, accordingly. Therefore, the argument goes, for English scholars mitigating their claims through hedges might be the right rhetorical choice so as to avoid rejection of their claims (or even worse, rejection of their paper by the journal reviewers). Therefore, one might argue that the fact that Indonesian scholars from the two disciplines used boosters more frequently than English scholars from the same disciplines might have something to do with the scope of readership addressed by the two groups of scholars. In other words, there might be a negative correlation between the size of readership addressed and the frequency of use of boosters. That is to say, the greater the size of the readership the smaller the frequency of use of boosters would be.

The argument that rhetorical features of academic writing are to some extent determined by the size of the intended scholarly community has been proposed by a number of scholars, one of them is Burgess (2002). Applying Swales’s (1990) three-move CARS (Create a Research Space) model, Burgess (2002) compared the rhetorical structure of the introduction section of research articles written in English and Spanish. The corpus for the study was composed of the following: linguistics texts written by native speakers (27 texts), Hispanic studies texts written in Spanish by native speakers (29 texts), English language studies texts written in Spanish by native speakers (20 texts), and English language studies texts written in English by Spanish native speakers (28 texts). Using deletion of moves 1 (i.e. “establishing a territory”) and 2 (i.e. “establishing a
niche”) in combination as the basis for comparison among the four sets of texts, the Hispanic studies set stood out, that is, only in this set was it found that some texts did not contain such combination of moves. Burgess argued that “this is because Hispanic studies is a relatively small community in which there is a clearly established research agenda and in which the writer is very likely to know key members of the community well …” (Burgess, 2002, p. 211).

Burgess is not alone in this respect. Based on the finding that Spanish business management scholars used inclusive we in their Spanish articles more frequently than English scholars in their English articles, Mur-Dueñas (2008) argued that the former group of scholars operated within the society with stronger communality. She further argued that: “This stronger communality felt in the Spanish RAs may have to do with the degree of homogeneity and size of the readership addressed in the two different broad contexts [Spanish readership in Spain versus international readership]” (p. 205). Similarly, Vassileva (1998) argued that “small and homogeneous cultures seem to be more coherent, so that ‘collective thinking’ tends to prevail over ‘individual thinking’ in them” (p. 181) to account for the presence of larger number of first person plural pronoun (we) in research articles written in Russian and Bulgarian compared to those written in English, French and German. Lorés-Sanz (2009) contended that the different rhetorical characteristics present in abstracts written in English and Spanish “may point to the size and nature of the expected readership” (p. 194).

However, as far as the findings of the present dissertation study are concerned, the notion that rhetorical features of research articles are solely determined by the size of readership was not fully substantiated. English and Indonesian chemistry scholars in the
present study were not significantly different from each other in terms of their use of hedges. This finding certainly invalidated the idea that the smaller the size of the intended scholarly community the more confidently the claims would be presented in research articles. It is to be reiterated that hedges are markers of tentativeness. That is, they are primarily used by writers to indicate that they do not fully commit to the validity of their claim. Therefore, if size of intended scholarly community is indeed the sole determinant of rhetorical features of research articles, there should have been a positive correlation between usage of hedges and size of community by the two groups of chemistry scholars. That is to say, English scholars, due to the much larger size of the scholarly community they wish to engage, should have used hedges significantly more frequently than Indonesian chemistry scholars.

In sum, the findings of the present study suggested that although the rhetorical features of research articles might partly be constrained by the size of the intended readership, the size of readership (scholarly community) does not constitute the sole determinant.

6.2.2 Degree of Homogeneity of Readership

From the explanation above, one might also argue that that the findings that Indonesian scholars were more assertive and/or more confident in their claim presentation than their English colleagues might be triggered by the differing degrees of homogeneity of the intended readership (i.e. Indonesian readership versus international readership). It has been mentioned above that boosters are solidarity markers, meaning that by using the rhetorical features the writers assume that the claims they make are
shared by their readership (Hyland, 2005a, 2005b). Hedges, on the other hand, signal the existence of diversity of voices on the issue being raised, or in other words, the assumption that the claims being promoted by the writer are shared by the readership is absent. Due to the much smaller size of the Indonesian scholarly community in the two disciplines, Indonesian scholars might characteristically assume that the community was homogeneous in regard to the viewpoints being promoted, that is, they might assume that their viewpoint and their readership’s viewpoint concurred to a great extent, and this assumption on their part provoked the frequent use of boosters in their research articles. Such frequent use of boosters rendered their claims assertive. For international scholarly community, given its much larger size, such homogeneity could not safely be assumed by English scholars and, for this reason (among other reasons), English scholars might think that the safe way to go was to present the claims tentatively. As will be stated shortly, while such argument might be valid, it did not receive full empirical support from the findings of the present study.

It is to be noted that there is no guarantee that size of community determines its degree of homogeneity. That is, it is not always the case that smaller communities are always more homogeneous than larger communities. However, researchers tended to assume that smaller community tends to be more homogeneous than larger one, simply because in the former community a smaller number of scholars are involved compared with in the latter community. In fact, it is this assumption (i.e. that size of community is negatively correlated with degree of homogeneity) which is widely held among academic writing scholars (Burgess, 2002; Lorés-Sanz, 2009; Vassileva, 1998).
As has been mentioned in passing above, this account did not seem to be supported by the finding for chemistry; the two groups of chemistry scholars used hedges comparably frequently, suggesting that degree of homogeneity of intended scholarly community did not largely determine rhetorical features of research articles (see discussion in the preceding section). Therefore, it seemed that although size and degree of expected community (i.e. the community the writers wish to engage) might affect rhetorical features, yet such influence was not large enough. In other words, the two social factors were not the sole determinant for rhetorical features of research articles, more particularly usage of hedging and boosting.

It should be borne in mind that the accounts offered so far in relation to the rhetorical characteristics of English and Indonesian research articles (from the two disciplines), more particularly the frequency of use of hedges and boosters in the two sets of scholarly texts, are tentative. The inclusion of English research articles published in international scholarly journals written by Indonesian scholars from the two disciplines would certainly confirm (or repudiate) the validity of the accounts offered above. If, for example, Indonesian scholars reduced their usage of boosters and increased their usage of hedges when they wrote in English addressing international readership, we might be quite confident to argue that it is indeed the size and homogeneity of the intended scholarly community which affects the use of hedges and boosters in research articles. Unfortunately, the absence of such empirical evidence urges us to regard the above accounts (detailed in this and preceding paragraphs) as hypothesis to be tested for future studies. If, by contrast, these scholars’ use of the two rhetorical features in their English writing (published in international journals) was relatively the same as that in their
Indonesian writing, or statistically speaking there was no significant difference between their English and Indonesian writing in terms of frequency of use of the two features, then the accounts offered above would be confirmed.

It is unfortunate that findings from previous research in relation to the issue raised here (i.e. whether non-native speaker scholars exhibit different rhetorical behavior when they write in English for international publication compared to when they write in their native language for local publication) are not robust. Pérez-Llantada (2010) found that research articles written in English for international publication by Spanish native speaker scholars resembled more research articles written in English by English native speaker scholars than research articles written in Spanish for local publication by Spanish native speaker scholars in terms of frequency of use of epistemic lexical verbs (e.g. *seem*, *indicate*). This empirical finding provided an indication that research article writers orient themselves with the characteristics of the readership they address. However, different finding was reported on by Vassileva (2001): English linguistics research articles written by Bulgarian native speaker scholars contain highest number of boosters compared to English articles written by native speakers and articles in Bulgarian by Bulgarian speakers (as can be expected, English articles by native speakers contain the lowest number of boosters). The finding for hedges mirrored the finding for boosters except that it goes in the opposite direction, where English articles by native speakers contain the highest number and English articles by Bulgarian speakers contained the lowest number. It is to be borne in mind that the study carried out by Vassileva (2001) used a very small corpus: only 60 pages of English articles by native speakers, 60 pages of Bulgarian articles by native speakers and 60 pages of English articles by Bulgarian speakers.
Therefore, on the basis of these conflicting findings, once again, the accounts offered in relation to the use of hedges and boosters in English and Indonesian research articles by the respective native speakers (i.e. size and degree of homogeneity of the intended scholarly community do not largely affect usage of the two features) should be taken as tentative.

6.2.3 Cultural Characteristics

Another obvious difference between English and Indonesian scholars is concerned with the sociocultural characteristics of the societies in which the two groups of scholars operate as knowledge dissemination agents. It is interesting to note that when there is a statistically significant difference observed between two groups of scholars writing in different languages the researchers’ default explanation has been that those scholars are constrained by the sociocultural conventions of the society within which they reside. Abdi (2009) and Hu and Cao (2011), for example, claimed that the use of hedges and boosters is a function of national culture. Moreover, such culture-related explanation quite often made reference to the works of Geert Hofstede (1984; Hofstede et al., 2010), that is three cultural dimensions of power distance, individualism and uncertainty avoidance.

Koutsantoni (2005a) reported that Greek scholars from the fields of electrical, electronic and chemical engineering were more assertive in the presentation of their claims in their research articles than their English disciplinary colleagues. According to Koutsantoni, such differing rhetorical behaviors were motivated by the differing cultural values which characterize the two national cultures; wherein Greek culture is associated
with such cultural characteristics as high uncertainty avoidance, high power distance, and collectivism, and the English culture is characterized by such values as low uncertainty avoidance, low power distance and individualism (see Hofstede, 1984; Hofstede et al., 2010).

Now let us see if the idea that sociocultural context affect rhetorical features of research articles was substantiated by the findings of the present study. Seen from the perspectives of the power distance and individualism/collectivism, it is true that English and Indonesian cultures are enormously different from each other (see Hofstede et al., 2010). The power distance index for Indonesia is 78, whereas the power distance indexes for English speaking countries (the countries in which the scholars whose research articles were analyzed in the present study reside) ranged from 35 to 40. Power distance was defined as “the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally (Hofstede et al., 2010, p. 61, emphasis in the original). In countries with a high power distance index, more powerful people are always considered right, for example “teachers are never publically contradicted or criticized” (Hofstede et al., 2010, p. 69). In the small-power-distance situation, by contrast, power is distributed equally among members of the society, for example “teachers are supposed to treat the students as basic equals and expect to be treated as equals by the students” (Hofstede et al., 2010, p. 69) and hence students’ disagreeing with their teachers is not considered taboo. This is especially the case in university education, where students are strongly encouraged to publically express their personal opinion in the class even though such opinion is in contrast to their professor’s opinion, a situation which is, of course, rarely found in large-power-distance
countries, such as Indonesia. There is no doubt that research article writers are teachers themselves, university professors to be more exact.

Granted, in both large- and small-power-distance situations the readership is also university professors from the same discipline, but in the former situation by virtue of their (the writers) status (as knowledge dissemination agent) they might consider themselves, and might also be considered by their readership, as more expert (i.e. more powerful). This differential relationship between the writer and reader which differentiates between large- and small-power-distance countries might have triggered why previous researchers argued that usage of hedges and boosters is associated with power distance index of the country in which the research articles are produced.

Another stark contrast between English-speaking countries in which the scholars whose research articles were analyzed in the present study and Indonesia was concerned with the degree of individualism. Whereas English-speaking countries have an individualism index which range from 80 to 91, the individualism index for Indonesia is much lower, which is 14 (Hofstede et al., 2010). This means that while English-speaking countries are highly individualistic, Indonesia is highly collectivistic. Individualistic countries are associated with “self-actualization: realizing to the fullest possible extent the creative potential present within the individual” (Hofstede et al., 2010, p. 129). In collectivistic countries, such as Indonesia, “what will be actualized is the interest and honor of the in-group, which may very well ask for self-effacement from many of the in-group members” (Hofstede et al., 2010, p. 129). Since boosters are markers of collective and/or consensual thinking (Hyland, 2005a), researchers typically argued that scholars from collectivistic countries will use them more frequently than those from
individualistic countries. By using boosters, those researchers argued, writers assume that their claim is not controversial, or in other words it is also shared by the readership. Therefore, one might argue that the difference between degree of individualism between Indonesia and English-speaking countries might be the cause of the differential usage of boosters in research articles written in the two languages.

Unfortunately, the above accounts were not fully supported by the findings of the present study. First, English and Indonesian chemists used hedges at comparable rates despite the fact that they produced their research articles in countries with different indexes for power distance and individualism. Second, scholars writing within the same sociocultural context (both English and Indonesian) were heterogeneous in terms of their rate of use of the two rhetorical features as indicated by the standard deviations (see Chapter 5). If the two cultural dimensions indeed largely affected the rhetorical features of research articles, the scholars writing within the same sociocultural context should be homogeneous in terms of their use hedges and boosters. Of course, it is improbable to find that all researchers operating within the same sociocultural context use hedges and boosters at exactly the same rate. However, what I am arguing is if sociocultural context indeed is the sole determinant for frequency of use of hedges and boosters, the variation (in terms of frequency use) should not be large, as indicated by the findings of the present study. To put it another way, if sociocultural context constitutes a sole determinant for rhetorical features of research articles, scholars from different disciplines (within the same sociocultural context) should be, to an extent, homogeneous in terms of their rate of use of hedges and boosters. Thus, it is quite safe to argue that sociocultural context is not the sole determinant for rhetorical features of research articles.
If we now look at the two groups of countries (Indonesia and English-speaking countries) in terms of the cultural dimension of uncertainty avoidance, the idea that sociocultural context is the determinant (let alone sole determinant) for rhetorical features of research articles can further be undermined as there is essentially no difference between the two groups of national cultures. The uncertainty avoidance index for Indonesia is 48, whereas the indexes for the English-speaking countries range from 35 and 51. Uncertainty avoidance is defined as “the extent to which the members of a culture feel threatened by ambiguous or unknown situations” (Hofstede et al., 2010, p. 191, emphasis in the original). Since the two groups of countries have comparable uncertainty avoidance index, we should expect that the presence of markers of uncertainty (i.e. hedges) in research articles written in the two languages (English and Indonesian) should also be comparable in terms of their frequency. In other words, there should be no significant difference between the two sets of research articles in terms of frequency of use of hedges. Unfortunately, this expectation was not fully supported by the findings of the present study. As can be seen earlier in the preceding chapter (Chapter 5), although there was no significant difference between English and Indonesian research articles from chemistry, the difference between the two sets of applied linguistics research articles was significant, and such difference was large, as indicated by the magnitude of the effect size. The analysis run on the combined data (i.e. data from the two disciplines combined from each of the two languages) also revealed significant difference between English and Indonesian research articles, although the difference was not as large as the difference observed for applied linguistics data alone (which was apparently due to the absence of significant difference between the two chemistry articles). The findings of the present
dissertation study, therefore, did not fully support the claim put forth by such researchers as Koutsantoni (2005a) that usage of hedges and boosters is influenced by the cultural characteristics, more particularly, the three cultural dimensions of power distance, individualism/collectivism and uncertainty avoidance.

Another piece of evidence from the present study which indicated that rhetorical features of research articles might not be decisively influenced by the cultural characteristics of the society in which the writers reside is the finding that, as has briefly been noted above, the two groups of scholars from the same society (let us assume that English speaking countries belong to the same society, due to their similarity in terms of their index for the three cultural dimensions) were significantly different in terms of their frequency of use of hedges and boosters. Indonesian chemistry scholars used hedges significantly more frequently, and used boosters significantly less frequently, than their fellow Indonesian scholars from applied linguistics. Similarly, boosters were used significantly more frequently by English applied linguistics than by their colleagues from chemistry. What these findings indicated, if we adamantly maintained that cultural dimensions as stated above affect the rhetorical features of research articles (more particularly usage of hedges and boosters), was that Indonesian scholars from the two disciplines, for example, did not reside within the same society. Another striking finding from the present study was that English chemistry scholars used hedges at comparable rates as Indonesian chemistry scholars. In other words, there was no statistically significant difference between English and Indonesian chemistry scholars in terms of their use of hedges. Again, if we insisted that rhetorical features of research articles were a function of the cultural characteristics of the society in which the writers operate, we
were forced to draw, based on this particular finding, an obviously false conclusion that English and Indonesian chemistry scholars lived within the same society, which misleadingly suggested that English and Indonesian cultures shared the same sociocultural context, a claim which is not warranted by the index for these two societies.

It should be borne in mind that I am not arguing that the idea that rhetorical features of research articles are determined by the cultural characteristics of the context to which the writer belongs is inherently suspect and, accordingly, presumptively invalid. Nor am I endorsing that, as should be clear from the discussion in the previous paragraph, such sociocultural context largely influences rhetorical features of research articles. Cultural characteristics might affect rhetorical features; it is just that the effect is not large enough, or in other words there are some other factors which might be more powerful in determining the rhetorical features of research articles. If we, however, reject outright the idea that cultural characteristics influence rhetorical features (in particular, usage of hedges and boosters), we might find it rather difficult to account for the finding of the present study which showed that Indonesian scholars from both disciplines used more boosters significantly more frequently than English scholars from the respective disciplines. Recall that the two societies (Indonesia and English-speaking countries) were enormously different in terms of degree of individualism and power-distance value, and that boosters are markers of certainty associated with power and communal and consensual thinking. To make my argument clear, the findings of the present study did not support the idea that sociocultural context is the only determinant factor which influences the rate of use of hedges and boosters in research articles, idea which has been advanced by previous researchers.
6.3 Discipline and Rhetorical Practice

The comparative analysis of frequency of use of hedges and boosters by English and Indonesian scholars from the same discipline revealed that the two groups of scholars did not adhere to the same rhetorical practice. English scholars from applied linguistics used hedges significantly more frequently, but use boosters significantly less frequently, than Indonesian scholars from the same discipline. It is striking to note that the difference between the two groups of applied linguists in this respect was considerably large as indicated by the magnitude of the effect size obtained. For chemistry scholars, the picture was not as neat as that observed for applied linguistics scholars; Indonesian scholars used boosters in their writing significantly more frequently, but the two groups were comparable as far as frequency of use of hedges was concerned. These findings strongly suggested that affiliation of the scholars with a particular discipline did not seem to constrain the rhetorical features of their research articles, especially their use of hedges and boosters, although for chemistry scholars it seemed to be the case with respect to use of hedges only.

According to Hyland (2006), the fundamental ontological difference between hard (natural) and soft knowledge domains has differing rhetorical consequences in research articles from the two knowledge domains. The fact that soft knowledge domains are more interpretative than hard knowledge domains means that scholars from the former knowledge domains have to “work harder to establish an understanding with readers” (Hyland, 2006, p. 37). Rhetorically, this implies that scholars from the soft knowledge domains tend to deploy rhetorical features at higher frequency rates than their counterparts from hard knowledge domains. Previous studies (e.g. Hyland, 2005b, 2008b;
Lafuente-Millán, 2008; Vázquez & Giner, 2008, 2009) indeed provided empirical support for this claim. However, the findings from the present study did not fully support Hyland’s claim. As has been stated earlier in the previous chapter, English scholars from the two fields under investigations (chemistry and applied linguistics) used hedges in their research articles at comparable frequency rate. Indonesian chemistry scholars use hedges significantly more frequently than their colleagues from applied linguistics, a finding which is inherently contradictory to Hyland’s claim.

Arguing that identity is integrally connected to disciplinary cultures, Hyland (2012, p. 25) claimed that “we are what we write. An engineer is an engineer because he or she communicates like one and the same is true for biologists, historians and linguists.” From the perspectives of the findings of the present dissertation study, this would imply that Indonesian applied linguists would not recognize, and by the same token would not be recognized by, their English disciplinary colleagues as applied linguists. This is simply because their (the two groups of applied linguists) rhetorical behaviors (in terms of use of hedges and boosters) were not the same. The most recent report on the use of hedges and boosters in research articles by male and female scholars from linguistics showed that female scholars used hedges much more frequently, but used boosters much less frequently, than their male counterparts (Szymańska, 2013). It seems then that disciplinary cultures did not largely influence the use of hedges and boosters in research articles.

Cross-disciplinary analysis conducted in the present study to examine whether the two disciplines were significantly different in terms of usage of hedges and boosters where the two data sets from the same discipline were combined (i.e. English and
Indonesian chemistry research articles were compared with English and Indonesian applied linguistics research articles) also revealed that the two disciplines were not significantly different in their use of hedges. It is to be borne in mind that the present study was not the only study which produced findings which are in disagreement with Hyland’s argument. Vold (2006a) reported that scholars from linguistics and medicine used hedges at significantly comparable rates. Similarly, the study conducted by Peacock (2006) also showed that boosters were used at comparable rates in research articles from business and environmental science. Abdi (2002) also reported that research articles in the fields of natural and social sciences used boosters at comparable frequency rates. Another study which provided empirical findings which contradicted Hyland’s claim is Rizomilioti (2006), which showed that research articles from biology contained more hedges than those from literary criticism, although it is clear that the latter discipline is interpretative to a greater extent than the former discipline.

Apart from the seemingly contradicting findings mentioned above, the present study also provided support for Hyland’s claim. Scholars from applied linguistics writing in English and Indonesian used boosters significantly more frequently than those from chemistry. The same result was also observed when the two data sets from chemistry were compared with the two data sets from applied linguistics. Following Hyland, the greater possibility for diverse outcomes from studies investigating the same issue in soft knowledge domain as opposed to hard knowledge domain, or even the more diverse interpretations which can be derived from a single finding in the former domain, leads to scholars’ using persuasive features more frequently. The conflicting findings obtained from different cross-disciplinary studies regarding usage of hedges and boosters in
research articles strongly suggest that rhetorical characteristics of research articles are not largely determined by the ontological characteristics of the parent disciplines. It is not to be taken to mean that ontological differences between knowledge domains do not have rhetorical effects. Apparently, they do, as the findings of the present study indicated (i.e. usage of boosters), yet such rhetorical effects might not as large as one might expect.

It would be unjustified to say that disciplinary conventions do not influence the rhetorical features of research articles. Scholars’ formal affiliation with particular disciplinary institutions certainly influences the rhetorical characteristics of their research articles. Persuading fellow scholars of the validity of the claim being presented involves projection of an identity as an insider of the relevant disciplinary community. In order to gain the status as an insider of a disciplinary community, scholars need to “align themselves with its knowledge-making practices” (Hyland, 2006, p. 19). Moreover, in order to achieve their intended objectives, scholars need to deploy generic conventions of their discipline, which in turn leads to their being accepted as members of the discipline. As in the words of (Bhatia, 2004, p. 21), “it is through genres that professional objectives are achieved, and it is through shared generic knowledge that professional solidarity is maintained.” To take one example, a chemistry scholar who presents his or her research using a qualitative method (rather than an experimental one) would no doubt be regarded as “a stranger” by the community members, which eventually leads to rejection of the presented knowledge.

However, as far as usage of hedges and boosters is concerned, such disciplinary influence does not seem to be profound. In other words, scholars are not greatly constrained by the discipline with which they are formally affiliated. There might be
other factors which also influence usage of hedges and boosters in research articles. The following section attempts to identify one of those factors.

### 6.4 Intrapersonal Factor

The discussion thus far provides a counter-argumentation of the factors which have been reported to solely influence usage of hedges and boosters in research articles. To reiterate, these factors are size of the expected scholarly community, degree of homogeneity of such community, national culture, and disciplinary affiliation of the scholars. We can express grave reservations about such argumentation (i.e. social cultural factors solely determine the rhetorical features of research articles) on the grounds that scholars from the same sociocultural context (or discipline) did not all behave rhetorically the same way in regard to their frequency of use of hedges and boosters in their research articles under investigation in the present study. For example, the mean and standard deviation for frequency of use of hedges by Indonesian scholars (the fields of applied linguistics and chemistry combined) was 5.46 and 4.07 per 1,000 words, respectively. This means that Indonesian scholars from the two disciplines on average used 5.46 hedges in their 1,000-word text, yet on average each scholar deviated from such mean usage by 4.07 hedges. Needless to say, Indonesian research articles were anything but uniform in terms of frequency of use of hedges.

As a consequence, to say that culture (either national or disciplinary, or both) is the sole determinant factor which influences rhetorical characteristics of research articles is based on the premise that cultural groups are homogeneous objects (see, for example, Bucholtz, 2003; Kubota, 1999; Spack, 1997 for discussion of the unwarranted notion that
culture is homogeneous). Even Hyland (2000, 2012), himself the proponent of the concept of ‘disciplinary identities,’ acknowledges that every community is characterized by diverse characteristics of its members. As he put it: “Every community is composed of individuals with diverse experiences, backgrounds, expertise, commitments, and influence and who differ in how far they subscribe to its various goals and methods, participate in its diverse activities, and identify with its conventions and values” Hyland (2006, p. 19). For this very reason, in the reminder of this chapter one intrapersonal factor is offered as the major factor which might determine the use of hedges and boosters in research articles in the two disciplines and languages. The following section discusses such intrapersonal factor, which is associated with two other entities. That is, in using a particular hedge or booster a writer materializes his or her cultural model and at the same time attempts to build a particular identity, as well as delivering a specific situated meaning of the hedge or booster in question.

6.4.1 Cultural Models, Identity Construction and Situated Meanings

The intrapersonal factor which might influence the use of hedges and boosters in research articles seems to be the cultural models associated with the use of such rhetorical features. The fact that, generally speaking, Indonesian scholars were more assertive than English scholars reflected differing group cultural models adopted by the two groups of scholars. Recall that cultural models are informal belief systems held by an individual used to help the individual to carry on the business of his or her living. For our present concern, it is the belief system which underlies the individual language use. For Indonesian scholars, research articles should carry authoritative tone, which represents
the absolute authority of the writers which is not supposed to be challenged by the readers. It might be no exaggeration to say that research article writers in Indonesia, by virtue of their status as college professors, are highly regarded as scientific knowledge-making agents. As knowledge-making agents, it might be taken for granted that whatever they present in their research articles must be true. It is this belief shared by people in Indonesia which might motivate research writers to be overly confident in their knowledge presentation.

The rhetorical patterning of research article introduction written in Indonesian provides telling evidence that the expertise of a researcher (and the absolute authority which comes with it) is not supposed to be questioned. In an analysis of 63 Indonesian research article introductions in three hard sciences (agriculture, biology and medicine) in terms of their rhetorical structure using Swales (2004) CARS (create a research space) model, Adnan (2008) showed that only 39 (61.90%) of those articles contained Move 2 (‘establishing a niche’) consisting of two obligatory steps, namely ‘indicating a gap’ and ‘adding to what is known,’ with 32 introductions containing only the former and 7 introductions containing only the latter. Of the 39 introductions with Move 2 in Adnan’s study, none was critical of a study or researcher. In other words, the move was realized without explicitly stating the limitations of previous studies. The question which arises now is why these 39 Indonesian scientists were reluctant to challenge or critique previous researchers. This surely does not stem from the fact that the researchers whose article introductions analyzed by Adnan almost did not have any access to scholarly journals and books, and hence their lack of critical statements of previous studies, as one might expect. Adnan reported that medical introductions contained more citations of previous
studies leading to the introduction of Move 2, but even these introductions, as has been mentioned above, did not contain critical evaluations of the studies reviewed. Adnan argued that such absence of critical comments on previous studies is the upshot of the Indonesian cultural values that consider criticism as unethical. Although this explanation is undoubtedly legitimate, I would argue that it is also by virtue of the unstated beliefs (i.e. cultural models) that regard researchers (in this case, professors) as experts who are not supposed to be challenged or criticized.

English scholars in the present study, by contrast, did not seem to see themselves as being endowed with absolute authority, and hence they did not operate within the same cultural models as Indonesian scholars did. Granted, English scholars are also perceived as experts in their field, but such status is quite different from the status as experts ascribed to their Indonesian colleagues; the difference lies in its vulnerability to criticisms. Analysis of any English research article introduction will provide solid evidence which suggests that the expertise of English scholars is susceptible to criticism. When a writer attempts to fill a knowledge gap, he or she typically argues that what has been done by previous researchers is limited, which is clearly a negative evaluation geared towards those previous researchers (Swales, 1990). This might trigger the more frequent use of hedges, and less frequent use of boosters, in English research articles, compared with Indonesian research articles.

It is to be noted that the rhetorical behavior of a scholar could change as a result of his or her prior encounter with different linguistic experience (see Hoey, 2005, 2007). But why does a scholar take the trouble to shift from one rhetorical behavior to another? To put it another way, why does a scholar decide to deviate from the typical rhetorical
behavior? The answer to this question seems to be related to their changing personal beliefs about what constitutes effective persuasion. In other words, owing to the unstable nature of cultural models (Gee, 2012, p. 97), the cultural models to which the scholar has previously been exposed (i.e. the ones underlying his or her previous rhetorical behavior) has now been replaced by a new set of cultural models, perhaps because the previous cultural models are now perceived by the scholar in question as no longer appropriate. This might explain why some Indonesian scholars behaved rhetorically more like English scholars, and English scholars behaved rhetorically more like Indonesian scholars, in terms of usage of hedges and boosters. For the Indonesian scholars who deviated rhetorically from their Indonesian colleagues, whose rhetorical behavior converged with that of the English scholars (i.e. those Indonesian scholars whose writing was largely cautious), it is probable that they did not share the same cultural models with other Indonesian scholars (i.e. those scholars whose writing was overly authoritative), but rather they operated within the cultural models valorized by English scholars. By the same token, those English scholars whose writing was more authoritative relative to the other English scholars’ writing can be regarded as sharing the same cultural models as the Indonesian scholars.

Recall that within seemingly the same national culture there can be diverse cultural models in operation (see Gee, 2012). But how do the English scholars come to share with the Indonesian scholars the same cultural models? Do they read Indonesian research articles, as Indonesian scholars read English articles? While such possibility cannot completely be ruled out, a number of other factors might trigger such condition (i.e. English scholars share with Indonesian scholars the same cultural modes), for
example professional meetings (e.g. conferences, international scholarly collaboration), informal communication with those scholars with authoritative tone in their writing, etc. (see Gee, 2012, p. 17 for how an individual comes to acquire a set of cultural models).

Through using boosters excessively in their research articles, Indonesian scholars might attempt to build an image of an expert, delivering the message that they were competent in the issue they were discussing. Consider the following example (mentioned earlier in the preceding chapter).

[50]   Air yang mengandung ion klor jika dilewatkan dalam resin penukar anion maka ion klor akan bertukar dengan ion penukar yang terikat pada gugus fungsi resin.

(CH)

(‘Water containing chloride ion will exchange with changing ion bound in functional cluster of resin.’)

In this example, the researchers were confident in the validity of the claim being made: that water will exchange with the changing ion under study is the only chemical outcome which can be obtained under the procedure they carried out. For these researchers, there was no alternative possibility which could occur. By doing so, they attempted to foreground their image as an expert. If they preferred to use modal mungkin ‘may,’ instead of akan ‘will,’ in the sentence above (suggesting that their outcome was not the only one to be expected in such a study) their readers might question their expertise in the issue they were addressing in the article. It is this possibility which the writers tried to avoid with the use of akan. We see here that boosters were linguistic devices used by Indonesian scholars to project an identity as an expert. To put it another way, using excessive boosting device was (at least for some of the Indonesian scholars) an
Indonesian way of behaving, interacting in order to project the expected identity (as an expert); it is the Discourse deployed by the Indonesian scholars for their advantage.

For English scholars, however, the deployment of boosters in their research articles might not be associated solely with the construction of expert identity. Although it might be true that the devices were also used by English scholars to build an image of a disciplinary expert, the fact that they used them relatively infrequently (compared with Indonesian scholars) strongly suggested that such devices might be interpreted (by English scholars) in a more negative way. For English scholars, boosters were conceived of as markers of impoliteness. Following Salager-Meyer, Ariza, and Briceño (2012), when academic writers use boosters “they are making too great an imposition on the reader” (p. 242), rhetorical behavior which needed as far as possible to be avoided in a society which valorizes individualism. It has been mentioned earlier in this chapter that in a society with individualism as its foundation every individual (in this particular case, every member of the discipline being the readership) is treated as equal basics. Therefore, pushing them to accept an idea (through use of boosting) might go against such valorized social value.

Are we saying then that Indonesian scholars were impolite since they used boosters excessively in their research articles? We have noted above that every linguistic behavior is to some extent influenced by the cultural models (or figured worlds) embraced by the speaker or writer. For Indonesian scholars, when they used boosters they expected their readers to enter a figured world which included the following events: scholars (i.e. professors) are experts in their field; therefore, they are supposed to be confident in the claim they are making. In such a figured world, there is no event which
depicts that authoritative or overly confident statements threaten the readers face. Even the readers (i.e. Indonesian readers) might not feel that their face is being threatened as a result of the deployment of boosters. Conversely, they might interpret such devices as markers of expert identity. By contrast, the figured world associated with the deployment of boosters by English scholars might contain an event which indicates that leaving no room for other alternative voices is a threat to the readers.

It is also true of usage of hedges by English scholars. By using such devices English scholars attempt to construct an identity as scholars who care about the face of their readers. Hedges in this case are used as negative politeness markers, where negative politeness was defined by Brown and Levinson (1987, p. 129) as “redressive action addressed to the addressee’s negative face: his want to have his freedom of action unhindered and his attention unimpeded.” Of course, they would not use the devices if the claim they are making is already clear. For example, they would not say that the sun might rise in the east. However, in the event that their claim is open to criticism (e.g. the generalizability of their claim is rather limited) they tend to hedge it, leaving space for the readers to insert their differing viewpoints about the same issue. To some extent, this rhetorical action can also be considered as the discursive construction of expert identity. However, the notion of ‘expert’ here should be interpreted in a rather different way than when we use it to talk about Indonesian scholars. When English scholars hedged their proposition they intended to project an identity as expert scholars, delivering the message that they knew that the phenomenon they described was open to multiple interpretations. In short, unlike Indonesian scholars, hedges might constitute the Discourse employed by English scholars to construct their desired scholarly identity. This might not be the case
for Indonesian scholars. It seemed that they did not associate usage of hedges with the notion of politeness, and for them politeness was not a component making up the figured world for hedging use.

The foregoing discussion shows that English and Indonesian scholars made use of linguistic resources to construct their scholarly identity differently. While Indonesian scholars relied heavily on boosters to construct their expert identity in their research articles, English scholars depended on hedging resources to do the same. What this implied was that the two rhetorical features (hedges and boosters) meant two different things for the two groups of scholars. For Indonesian scholars boosters were associated with positive meaning (i.e. devices which they used to persuade their readers of the validity of their claim, which in turn they used to construct expert identity), but for English scholars boosters carried negative meaning (i.e. devices which impose unfavorably on the readers). This meant that boosters had at least two situated meanings, depending on where they were deployed. The same also held true of hedges. This time hedges were perceived by English scholars as desirable, as devices used to avoid face threatening acts (see Brown & Levinson, 1987), whereas in the Indonesian context they were regarded as devices which might hampered their effort to construct an identity as an expert, and hence they were considered as devices which needed to be avoided as far as possible. Thus, like boosters, hedges in research articles also had at least two different situated meanings, again depending on the context where they were put to use.

The discussion thus far only applied to those scholars who exhibited rhetorical behavior typical of English and Indonesian writing in general. As has been shown in the preceding chapter, there were some scholars from each group (English and Indonesian)
who did not seem to conform to the typical rhetorical behavior of their respective group. Some English scholars wrote more like Indonesian, where hedges were not predominant in their articles, and some Indonesian scholars wrote more like English scholars, where their articles contained more hedges than boosters. Now let us shift our attention to these sub-groups of the scholars. We have pointed out above that the rhetorical behaviors of these scholars were to some extent determined by the cultural models (i.e. the informal theories) they hold. Identity construction can also be used to account for the rhetorical action of these scholars. For example, those Indonesian scholars who used hedges more frequently than boosters in their research articles might want to construct an identity similar to the one projected by the typical English scholar. This might be engendered by their previous encounter not only with English research articles but also with English scholars themselves. The same can also be said about those English scholars who diverge from the typical English rhetorical characteristics. This strongly suggests that even within the same sociocultural context a single rhetorical feature can have more than one situated meaning; the situated meaning ascribed to hedging devices by some members might be different from that ascribed by other members of the same society.

Since hedges and boosters had different situated meanings from the perspectives of English and Indonesian scholars, there could be miscommunication between the two groups of scholars. It has been pointed out in Chapter 2 that what is intended by a speaker might not be interpreted as such by the interlocutor. Therefore, again due to the differing situated meanings of the two features ascribed by the two groups of scholars, upon reading English research articles Indonesian scholars might think that English scholars are not very confident in their claims, and therefore might question their (English
scholars) expertise in the issue being presented. By the same token, English scholars (upon reading English manuscripts written by Indonesian scholars using Indonesian rhetorical conventions) might think that Indonesian scholars are too arrogant, making great imposition on the readers. Alternatively, they (English scholars) might also question the expertise of the Indonesian scholars given the narrow mindedness of their claims (i.e. Indonesian scholars think that their claims are the only ones which are available and other claims are not possible).

6.5 Conclusion

We have seen that English and Indonesian scholars from the two disciplinary fields made use of hedges and boosters in their research articles at different frequency rates, which generally indicated that English scholars were more cautious in presenting their claims. In this chapter, three social factors (i.e. those factors which have been argued by previous researchers as determinants of rhetorical characteristics) were explored to see the extent to which they could account for the differing degrees of certainty expressed by the two groups of scholars (English and Indonesian). These factors are size of intended readership, degree of homogeneity of the readership and cultural characteristics of the society in which the two groups of scholars reside. In addition to these factors, we have also pointed out that discipline has been considered to exert an influence on the use of hedges and boosters in research articles, and hence this factor is also scrutinized.

However, the four factors mentioned in the preceding paragraph could not fully account for the findings of the present dissertation study, as the frequency of use of
hedges and boosters by scholars in each group was anything but uniform. The above four influences assume that all members of the same culture (either national or disciplinary) show relatively the same rhetorical behavior in their research articles. This is not to be taken to mean, however, that those four factors do not have any impact on the use of hedges and boosters. They do, but the impact in question might not be as large as has been theorized by previous researchers.

One complementary intrapersonal factor (i.e. cultural models, together with the other two interrelated notions of situated meanings and identity construction) is offered in this chapter to account for the differing frequency of use of hedges and boosters by the two groups of scholars. The major advantage of this account is its ability to explain not only the differing rhetorical characteristics of English and Indonesian scholars (as a group), but also the rhetorical characteristics of those who did not strictly follow the rhetorical conventions of their group (either cultural or disciplinary).
Chapter 7 Conclusion

7.1 Introduction

The overall aim of the study reported on in this dissertation was to examine whether sociocultural context (i.e. operationally defined as the social milieu or society in which the languages under study were used as primary means of communication) in which research articles were produced and discipline had a significant impact on the degree of certainty of claims presented in the articles. To this end, 104 research articles from two different disciplines (applied linguistics and chemistry) written in English and Indonesian were quantitatively analyzed in terms of the frequency of use of hedges and boosters. Specifically, the study was designed to answer the following research questions: (1) whether English and Indonesian scholars (fields combined) used hedges and boosters at different frequency rates from each other; (2) whether English applied linguists and Indonesian applied linguists used the two features at different frequency rates; (3) whether English chemists and Indonesian chemists used the features at different frequency rates; and (4) whether the linguistic realizations of the two features in the two languages were different. Unlike the other three research questions, research question (4) was not intended to answer any theoretical question, but rather it was posed to serve purely pedagogical purposes. More specifically, it was intended to inform EAP teachers in Indonesia as regards what type of vocabulary needs to be focused on in their teaching. The following section summarizes the findings of the present dissertation study and offers the resulting conclusions. Following such summary and conclusions is the section on the limitations of the study, followed by a section on the pedagogical implications of
the study. Finally, in the last section of this chapter, suggestions for further study are recommended.

7.2 Summary of Findings and Conclusions

The findings of the present dissertation study showed that collectively English scholars (i.e. scholars from applied linguistics and chemistry) were more cautious in making claims than Indonesian scholars from the same fields. To put it another way, Indonesian scholars were more confident and/or authoritative than English scholars. While hedges were more abundant in English research articles, Indonesian articles were characterized by the more frequent use of boosters. However, when the comparison was carried out based on discipline (i.e. when English and Indonesian scholars from the same discipline were compared) the emerging picture was quite different; while English applied linguistics articles contained more hedges but fewer boosters than Indonesian research articles, English and Indonesian chemistry articles used hedges comparably frequently, although the latter set of articles used boosters more frequently. In terms of frequency of usage of hedges, English applied linguists and chemists were not different from each other, yet the former group of scholars used boosters more frequently in their research articles than the latter group. A striking finding from the present study was derived from the comparison of the two groups of Indonesian scholars. Contrary to what previous researchers typically believed that hard science disciplines avoid using tentative linguistic markers due to the nature of data they deal with, Indonesian chemistry research articles contained more hedges than research articles from applied linguistics. Another finding of the present study was that in both English and Indonesian corpora the
frequency of use of hedges and boosters was far from uniform. This was also true of the use of the features by scholars from the same discipline.

One of the conclusions which can be drawn from the above findings is that sociocultural contexts in which the research articles are produced are not the sole determinant which influences the rhetorical features of research articles. This was clearly indicated by the finding that the two groups of scholars writing within the same sociocultural context (i.e. applied linguists and chemists writing in the same language) used hedges and boosters in their research articles at significantly different rates. If it was indeed the case that sociocultural contexts solely determined rhetorical features of research articles, as some researchers argued, there should be no significant difference in the frequency of use of the two sets of research articles produced within the same sociocultural context. The non-uniformity of the frequency of use of the rhetorical features among researchers within the same sociocultural context also provided an indication that sociocultural context was not the sole factor which influenced rhetorical features of research articles. This is not to be taken to mean, however, that sociocultural context does not exert any influence on the rhetorical features of research articles. It is just that sociocultural context does not come as the sole determinant for rhetorical features of research articles.

The idea that discipline solely determines the rhetorical features of research articles also did not find empirical support from the present study, as indicated by the finding that English scholars and Indonesian scholars from the same discipline did not use the rhetorical features under study (hedges and boosters) comparably frequently. Therefore, another conclusion which can be drawn from the findings of the present study
is that discipline (i.e. disciplinary affiliation of the scholars) does not largely influence the rhetorical characteristics of research articles. The finding that scholars from the same discipline did not use hedges and boosters at comparable rates, but rather the discrepancies among them in terms of frequency of use of such features were quite significant further indicated that discipline was not the sole factor which determined rhetorical features of research articles.

Although the idea that sociocultural context and discipline determine rhetorical features of research articles does not find strong empirical support from the present study, these two factors should not be completely rejected as determinants of research article rhetorical features. What the findings of the present study shows is that the sociocultural context and discipline affect rhetorical features of research articles, only that the effects in question are not as large as has been argued by previous researchers. In the preceding chapter, what other researchers have previously argued as the factors which determine the rhetorical features of academic writing (e.g. rhetorical moves, use of first person pronouns) were also explored as the potential determinants of usage of hedges and boosters in research articles. These factors are size of the intended readership and degree of homogeneity of the intended readership. However, like the factors sociocultural context and discipline, these two latter factors also did not find full empirical support, which was indicated by the far-from-uniform nature of the frequency of use of the two features under study. However, these two factors should not completely ruled out as determinants of research article rhetorical features.

That being said, there are other factors which also might contribute to the degree of certainty of claims presented in research articles. In this dissertation, one of such
factors is proposed, namely cultural models held by writers. One might argue that the rhetorical style of a scholar is influenced by his or her previous academic literacy experience. For example, a scholar who has been exposed to English research articles might display in his or her research articles written in another language (i.e. native language) rhetorical features similar to English research articles. However, despite the fact that the scholar has extensively been exposed to a certain writing style, if such style does not sit well with his or her personal belief (i.e. cultural model) regarding what constitutes an appropriate persuasive style, it will not significantly influence the rhetorical characteristics of his or her style.

It is to be noted that although sociocultural context and discipline do not seem to largely affect rhetorical features of research articles, it does not necessarily mean that research article writers are free to write their articles as they wish. There are certain demands (sociocultural and disciplinary) which they need to meet. Ignoring these demands might result in their failure to gain persuasion from the intended readership. For example, writing with an overly cautious tone intended for readership having a belief system (i.e. cultural model) that scholars have to be confident in the claims they make might not produce the intended results. By the same token, greatly diverging from the disciplinary conventions (for example to simply meet the demands of the local cultural contexts) might not produce favorable outcome either. But this does not necessarily mean that scholars are greatly imprisoned by their cultural (both ethnic and disciplinary) conventions. There is room for them to construct an identity they wish, as long as such identity does not stand in stark contrast with the typical identity projected by other scholars from the same culture (either ethnic or disciplinary) (see Hyland, 2009). This
strongly suggests that writers are not completely acquiescent to the sociocultural values of the society to which they belong and disciplines with which they are formally affiliated, but rather they are agentive (see Canagarajah, 2006). In the present study, scholars take advantage of hedges and boosters to construct the identity they wish. For example, some Indonesian scholars do not slavishly follow the typical rhetorical conventions of Indonesian academic writing, and in so doing they might wish to project an image as scholars who are familiar with rhetorical conventions other than Indonesian rhetorical conventions. For both English and Indonesian scholars, hedges and boosters constitute the Discourse (minus non-linguistic resources).

7.3 Limitations of the Present Study

The identification of linguistic realizations of hedges and boosters in the present study was conducted by the researcher alone. As has been mentioned earlier, this was done largely because of the difficulty experienced by the researcher to find an Indonesian native-speaker volunteer who was willing to do the coding job for the Indonesian data. Determining whether a certain linguistic feature should be counted into the analysis (i.e. whether it was a hedge or booster, or not) was admittedly not a simple task; it was not a matter of counting predetermined features (i.e. those features which had been regarded as hedges or boosters by previous researchers). It was pointed out that the determination of whether a linguistic device (be it a word or phrase) was a hedge or booster was based on the semantic and pragmatic meaning which the device carried in a certain context. Therefore, a certain device represented a booster in one context, but used in another context it did not. The case in point was the modal will. This very methodological
practice has sparked controversy among researchers as regards to what counts as hedges and boosters (see Crompton, 1997). The issue is not whether a certain linguistic feature is a hedge or booster, but rather whether the linguistic feature in question should be regarded as hedge or not (or booster or not).

As a consequence, should at least one native speaker of the two languages under investigation in the present study (English and Indonesian) be involved in the coding process, the results of the study might turn out to be quite different. It follows, then, that the conclusion drawn from the study might also be different from the one described in this chapter. It was simply because the list of hedges and boosters they would derive might be quite different from the list based on which the analysis in the present study was conducted. It is quite safe to argue that the degree of validity of statistical analysis carried out in a study involving data coding is to some extent determined by the reliability of the coding system deployed which is typically measured through inter-rater reliability test. In the present study, such inter-rater reliability is absent.

To reiterate, the present study investigated the frequency of use of hedges and boosters in research articles from only the disciplines of applied linguistics and chemistry. The inclusion of such disciplines was aimed at illuminating the effects of discipline on the frequency of use of the two rhetorical features under study. Needless to say, the two disciplines included in the study could not be regarded as fully representing the available disciplines. Chemistry might not represent such disciplines as engineering disciplines (e.g. mechanical engineering, electrical engineering), and applied linguistics might not represent such fields as sociology and economics. Should much more disciplines be included in the present study, the results might be more revealing.
Therefore, drawing a conclusion about the effects of discipline on the frequency of use of hedges and boosters in research articles based on only two disciplines might be an overgeneralization.

In the present study, the analysis was carried out on the articles written by native-speaker scholars only. The aim was to include only those articles written by scholars in the language which is their native language. The native-speaker status of the scholars, as has been mentioned earlier, was solely determined from their names (e.g. for English articles, only those articles written by scholars with Anglo Saxon name were included in the corpus). Although seemingly straightforward enough, such methodological practice was not without any problem. Although it was true that identification of Indonesian scholars was not a problem due to the researcher’s familiarity with the Indonesian names, the problem was immediately apparent for English scholars. Just because their names sounded Anglo Saxon did not guarantee that they use English as a native language. By the same token, it was not impossible that scholars with non-Anglo Saxon name used English as a native language, especially those who were born and grew up in English speaking countries such as The United States. In sum, basing the native-speaker status of the scholars on their name (as also adopted by previous studies) might be problematic, which in turn might affect the results of the study. For this reason, it might be that the scholars whose research articles were included in the corpus for the present study might not be native speakers.

The present study was aimed at shedding light on the effects of sociocultural context in which research articles were produced on their rhetorical features. To this end, the corpus for the study was constructed so as to include research articles from the two
languages with similar characteristics. However, as has been acknowledged in the Design chapter, a few confounding variables (e.g. educational background of the scholars, their academic experience) could not be controlled. Therefore, in the absence of such control of the confounding variables the conclusion drawn in this chapter should remain highly tentative. If such confounding variables were able to be controlled at the outset of the study, quite different results might be obtained, and therefore quite different conclusion from the one drawn in this chapter might be arrived at.

7.4 Pedagogical Implications

Rosa and Eschholz (2012) gave advice to student writers that they should not use “too many words or phrases like I think, in my opinion, maybe, sometimes, and probably” (p. 545). In other words, the writers suggested that students should avoid using hedges in their composition. Unfortunately, the findings of the present study did not substantiate such pedagogical advice. Even in research articles from such discipline as chemistry, a discipline used to be conceived of as hard core science where precision is prioritized, hedges were quite pervasive. In fact, Indonesian chemists used hedges significantly more frequently than their colleagues from applied linguistics. Therefore, what the findings of the present study pedagogically suggested was that academic writing teachers (not only English for Academic Purposes (EAP) teachers but also English L1 composition ones) should not be wary of suggesting students that they use hedges in their academic writing. Rather than being markers of incompetence (i.e. lack of knowledge) which are regarded as hampering the persuasive characteristic of academic writing, the present study indicated such devices constituted important rhetorical features used by the writers to
persuade readers of the validity of their claims. However, the teacher should ensure that
the use of hedges by the students is appropriate, otherwise hedges will no doubt send a
message that the writer is indeed incompetent in what he or she is discussing.

The pedagogical implication of the finding that Indonesian research articles were
more cautious than English research articles is quite transparent. That is, EAP teachers in
Indonesia should raise Indonesian students’ awareness that Indonesian academic writing
is quite different from English academic writing in terms of degree of authoritativeness of
the claims presented. By students, it is mean not only university students who take the
course of English academic writing, but also scholars who take the course. Such
awareness-raising will enable the students to avoid transferring their Indonesian
rhetorical characteristics when they write in English, particularly those scholars who wish
to publish in international scholarly journals. But EAP teachers in Indonesia should also
make their students aware that it is possible to compose academic writing in English for
the Indonesian readership (which is quite common in Indonesia nowadays) using the
Indonesian rhetorical characteristics. Using rhetorical style which sits well with the
cultural demands should be more effective than otherwise.

The present study has produced findings that English scholars use significantly
more frequently such linguistic forms as modals, likelihood adverbs, verbs to hedge their
claims. Pedagogically this means that Indonesian EAP teachers need to devote their time
to equip the students with knowledge of how to use such linguistic forms as hedging
markers. Another finding of the present study is that Indonesian scholars use modals,
adverbs and verbs to boost their claim, finding which suggests that Indonesian scholars
who want to publish in international journals need to minimize such boosting markers in
the articles.

Finally, a broader pedagogical implication is that teachers should inform their
students that it is not problematic to use slightly divergent rhetorical style in their
academic writing. By slightly it is meant that such divergent is not so obvious that the
other community members recognize them (i.e. the students and scholars alike) as
outsiders of the community, which in turn will hamper the achievement of persuasion.

7.5 Suggestions for Further Research

The present study was aimed, as has been mentioned earlier several times, at
examining the effects of sociocultural context on the degree of certainty of claims made
in research articles. It has been pointed out that the sociocultural contexts in which
English and Indonesian research articles were produced were sufficiently different, and
such difference was not largely reflected on the rhetorical features characterizing English
and Indonesian research articles. In the present study one language (i.e. Indonesian) was
compared with another language (i.e. English). For future studies, it is suggested that the
comparison should be conducted on not only a set of languages with different
sociocultural characteristics but also a set of languages with the same sociocultural
characteristics. This means that the studies should involve more than two different
languages. The studies should adopt double cross-cultural comparison: first, a set of
languages with different sociocultural characteristics should be compared and second,
another set of languages (this time with similar sociocultural characteristics) should be
compared. In so doing, more substantive findings could be obtained in regard to the
effects of sociocultural context on the rhetorical features of research articles. For example, if the findings show that there is significant difference in the first comparison, but not in the second one, it can confidently be concluded that it is indeed sociocultural context which influences the rhetorical features of research articles.

One might ask how an applied linguist should be competent in at least four languages. While there might be a few applied linguists having such linguistic skills, the majority of them are bilingual, where one of the two languages mastered is English and the other their native language. It should be kept in mind that the suggestion offered here does not require that a researcher should be competent in (at least) four languages being investigated. Rather, the study should be a collaborative endeavor, wherein each researcher is responsible for the analysis of the language he or she speaks as native language. Quite surprisingly, collaborative studies involving researchers from diverse sociocultural contexts are almost inexistent. This might be due to financial sources available. For example, conducting a meeting to discuss the findings of the study where the researchers are from, for example, four different continents is no doubt very expensive. Therefore, the suggestion offered here can be regarded as an ambitious one. But such collaborative effort is worth it if substantive knowledge in regard to the effects of is the goal.

It is also true of the number of disciplines to be included in future studies. Double cross-disciplinary comparison can similarly yield more robust findings regarding the effects of discipline on rhetorical features of research articles. The researchers will be in a better position to argue that discipline influences rhetorical features of research articles if they find that disciplines with similar characteristics are not significantly different in
terms of the use of hedges and boosters, but that disciplines with different characteristics are significantly different in this regard.

One might be skeptical about how cultures should be compartmentalized in any meaningful way in this globalization era, where it seems that English culture has been transported to other non-English cultures, and hence the idea of sociocultural context needs to be abandoned. I share with U. Connor (2011) that although cultures have now been “contaminated” by other cultures, fundamentally each of them is different from another. To use an analogy, a piece of fabric can have numerous colors on it, but it is not difficult to identify the foundational color upon which the other colors are printed. Similar criticism might also be directed to the concept of discipline, as different criteria result in different grouping of disciplines. For example, applied linguistics and psycholinguistics might be categorized as belonging to the same disciplinary category since both are concerned with the study of language. However, they might be categorized as different disciplines if we consider the typical research methodology employed; while applied linguistics typically employ qualitative methods, psycholinguistics tend to use experimental methods. This is the daunting task which cross-cultural and cross-disciplinary researchers have to face and solve if a better knowledge of the effects of discipline and sociocultural context on rhetorical characteristics of research articles is the goal. Categorizing disciplines into hard and soft sciences have been proven to be an overgeneralization. Similarly, categorizing cultures in terms of binary distinctions (e.g. individualism vs. collectivism) seems to be no longer productive. Unfortunately, I do not have a specific suggestion regarding this matter.
Finally, the present study heavily relies on the corpus linguistic method to answer the research questions. The explanations offered and conclusions derived from the findings, as have been pointed out before, are highly tentative. This limitation might be able to be solved in future studies through triangulation of data. That is, it might be more beneficial if the quantitative data are supplemented by data gathered from qualitative method, such as interviews. However, care needs to be taken when considering interviews as the supplementary methodological technique in gathering data, so as not to produce conflicting findings. Previous studies have found that what writers report during the interview about their rhetorical behavior is contradictory to what they actually practice in their writing. Harwood (2006), for example, shows that political scientists who state that first person pronouns should not be used in political science research articles in fact use them in their articles.

It is to be reiterated that there is one alternative factor offered here which is assumed to have affected the rhetorical features of English and Indonesian research articles, namely cultural models embraced by the individual scholars. To investigate the validity of this hypothesis, future studies can use not only interview method, but also a carefully designed questionnaire, along with corpus linguistic method. But we need to keep in mind that any self-report method is not free from the possibility that what is reported by the participants might not be the same as what they actually do. For example, they might record on the questionnaire that boosters are markers of impoliteness (which is their cultural model regarding the use of boosters), but when we inspect their writings they might contain quite many of them, or vice versa.
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Appendix A. Linguistic Forms of Hedges and Boosters

English Applied Linguistics: Hedges

Adjectives: apparent, possible, potential, relative, some, typical

Adverbs: apparently, likely, perhaps, possibly, potentially, probably, seemingly, commonly, frequently, generally, in general, normally, often, on some occasions, overall, primarily, typically, usually, fairly, in most cases, in some cases, in some ways, largely, predominantly, quite, relatively, sometimes, somewhat, to some degree, to some extent

Verbs: appear, assume, hypothesize, indicate, seem, suggest, tend

Modals: may, might, would

Noun: hypothesis, assumption, indication, tendency

English Applied Linguistics: Boosters

Adverbs: actually, always, certainly, clearly, in fact, indeed, noticeably, obviously, of course, vividly, completely, considerably, entirely, especially, fully, greatly, heavily, highly, necessarily, overly, particularly, significantly, so, strongly, too, very, wholly

Verbs: believe, be going to, highlight, know, mean, reveal, show

Adjectives: clear, considerable, demonstrable, evident, noticeable, obvious, significant, well-established, widely-accepted

Noun: fact

Modals: must, should, will

Indonesian Applied Linguistics: Hedges


Verbs: asumsi ‘to assume’, indikasi ‘to indicate’, isyarat ‘to signal’, tanda ‘to signal’

Modals: bisa ‘can (tentative)’, boleh ‘can (tentative)’, mungkin ‘may’

**Indonesian Applied Linguistics: Boosters**

Modals: akan ‘will (epistemic)’ harus ‘must (epistemic)’, pasti ‘must (epistemic)’


Nouns: bukti ‘evidence’, fakta ‘fact’, kenyataan ‘reality’

Adjectives: jelaskan ‘clear’, nyata ‘real’, setiap ‘every’

**English Chemistry: Hedges**

Adjectives: about, common, apparent, possible, presumable, probable, relative, tentative, typical

Adverbs: approximately, almost, apparently, commonly, essentially, for most cases, frequently, generally, in general, in many cases, in principle, largely, likely, normally, often, overall, perhaps, possibly, potentially, predominantly, presumably, probably, quite, rather, relatively, seemingly, somehow, somewhat, tentatively, to a large extent, typically, usually

Verbs: appear, approximate, assume, estimate, indicate, propose, seem, suggest, tend

Modals: may, might, would

Noun: potential

**English Chemistry: Boosters**

Adjectives: clear, considerable, evident, extreme, great, notable, noticeable, observable, obvious, particular, profound, remarkable, significant, strong, substantial, well-established, well-known

Adverbs: actually, always, certainly, clearly, distinctively, exceptionally, expectedly, unambiguously, unequivocally, considerably, completely, extremely, fully, greatly, highly, in fact, indeed, necessarily, notably, particularly, remarkably, significantly, strongly, substantially, too, very
English: Verbs: believe, demonstrate, have to, highlight, know, prove, reveal, show
Noun: fact
Modals: should, will (certainty)

Indonesian Chemistry: Hedges

Verbs: diasumsikan ‘be assumed’, diduga ‘predicted’, mengindikasikan ‘indicate’,
diprediksi ‘be predicted’, menandakan ‘to signal’

kemungkinan ‘possibility’

‘basically’, relatif ‘relatively’, sekitar ‘around’, sering ‘often’, umumnya
‘generally’

Modals: bisa ‘can (tentative)’, mungkin ‘may’

Indonesian Chemistry: Boosters

Modal: akan ‘will’

Verbs: dikenal ‘popularly known’, diketahui ‘known’, terlihat ‘can be seen’,
tampak ‘obvious’, menunjukkan ‘show’

Adverbs: sangat ‘very’, sekali ‘very’ sebenarnya ‘actually’, selalu ‘always’, setiap
‘every’
Appendix B. Research Articles Analyzed in the Present Study

English Applied Linguistics


Indonesian Applied Linguistics


*Linguistika*, 14, pp. 1-23.


Usman, F. (2009). Bentuk lingual *tawa* pengobatan tradisional Minangkabau (analisis 

**English Chemistry**

differences of carbohydrates in defatted soybean flour and soy protein isolate by-

*Carbohydrate Polymers*, 69, pp. 554–561.

Selective hydrogenation of amides using ruthenium/molybdenum catalysts. 

of a model homogalacturonan with a salt-independent pectin methylesterase 
from citrus: I. Effect of pH on demethylated block size, block number and 

catalyzed n-demethylation/n-acylation of some morphine and tropane alkaloids. 


**Indonesian Chemistry**


(*Calophyllum inophyllum* L.) dan kemungkinan korelasinya sebagai antikanker. 

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