



ORIGINAL RESEARCH PAPER

English Engagement Markers: A Comparison of Humanities and Science Journal Articles

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(Received: 20 December 2016; Accepted: 15 January 2017)

Engagement markers (hereafter, EMs) are crucial interpersonal devices to interact with readers through texts. However, little is known about the differences of EMs use in Humanities and Science journal research articles (hereafter, RAs), as well as the changes in markers use over the passage of time. The present study provides a quantitative and contrastive analysis based on two corpora consisting of four disciplines of Humanities RAs (Psychology, Sociology, Economics and Law) and four disciplines of science RAs (Mathematics, Geology, Physics and Biology). Sixteen articles from each discipline were selected randomly from a pool of journal RAs. All sections of the articles were scrutinized for the purpose of the study. The obtained results indicate that Humanities RAs make use of more EMs than Science RAs. Also, the findings of this study suggest that directives are used more than other markers both in Humanities and Science RAs. Regarding the use of EMs in the decades of 1990s and 2000s, a significant increase in the use of EMs was observed with the passage of time, both in Humanities and Science RAs.

Keywords: Engagement Markers, Humanities, Science, Research Articles.

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Introduction

Traditionally, academic writing had an objective, faceless and impersonal form of discourse, but over the past decade, it has taken a new form to itself and it is like a persuasive struggle to create an effective interaction between writers and readers (Hyland 2005a). Recently, the idea of writing academic articles to create texts that just represent an external reality has changed. This change is moving toward the relationship between participants in the discourse (Hyland 2005b). Considering this view, authors do not just rely on the production of a text to convey ideation content and information, but also it is important for them what they produce is reasonable and comprehensive. If their texts have these characteristics, they will have an effective communication. Linguists believe that writers should use language to acknowledge, construct and negotiate social relations. To be successful in writing academic texts, the writer should have an awareness of both its readers and its consequences (Hyland 2005a).

In order to shed more light on reader-writer interaction, metadiscourse and its classification and EMs, each will be dealt with in more detail in the following sections.

Writer-reader Interaction

Interaction in writing in different disciplines has been proposed by many writers under various terminologies. For instance, Crismore (1989) has used the term "metadiscourse" to refer to the communicative function of language and also the importance of writer-reader interaction in writing. Another widely used term is "voice as self-representation" which is used by social constructivists (Elbow 1994). Hyland (1999) has used the term "stance" to refer to a model of interaction in academic discourse.

Writers interact differently with their readers. A good writer should consider "reader's background knowledge, his/her personal traits, processing constraints, recognition of face needs of readers" (Myers 1989) and their social, cultural backgrounds which may be effective in communication. It has been long argued that to improve the skill of writing more effectively, developing an awareness of the audience and an ability to reflect and exploit that awareness in the way that the text is written is essential among other things (Nystrand 1986; Kirsch & Roen 1999; Grabe & Kaplan 1996; Johns 1996).

How a text is organized and the way in which this organization is reflected is affected by audience awareness. Traditional text meanings have their sources in the text itself (formalist theories), in the author's intention (expressive theories and cognitive theories of writing), or in the reader's cognition (reader response theories and cognitive theories of reading) (Nystrand 1999). On the other hand, we have dialogic discourse which finds the source of text meaning in the unfolding dialogue or interaction between writers and their readers and principally it is related to the perspectives of Bakhtin (1981, 1986) and Rommetveit (1974, 1992). Dialogic perspective is an element of Appraisal theory and is based on the view that "all verbal communication, whether it is spoken or written, can be seen as dialogic, because principally every statement is made to refer to what has been stated and, at

the same time, to elicit responses from its readers or listeners" (Martin & White 2005, 92).

Metadiscourse

Metadiscourse which is relatively a newly introduced concept was originally defined by Williams (1981) as writing about writing and it refers to how authors manage to interact with their audiences. Metadiscourse is a discourse which does not refer to the transition of information, rather it is used and developed by the writer through the text to help readers to connect, organize, interpret, evaluate and develop attitudes toward the material (Vande Kopple 1997). According to Vande Kopple (1985) and Crismore (1989), witting involves two levels: discourse level and metadiscourse level. On the discourse level, the writer provides propositional information for the reader and on the metadiscourse level, the writer guides the reader through the text. Therefore, metadiscourse is a good way of expressing the writer's attitudes and organizing the discourse which involves the audience. (Fuertes-Olivera et al. 2001). In the next part, a brief classification of metadiscourse has been provided.

Metadiscourse Classification

Hyland (1998) has divided metadiscourse into two categories: interpersonal metadiscourse and textual metadiscourse. The interpersonal metadiscourse is to use language for encoding interaction and it is a good way to engage with others, to take on roles and to understand and express feelings and evaluations. The textual function is the use of language to organize the text itself, coherently relating what is said to the words and to others. Textual metadiscourse has five functions, namely logical connectives, frame markers, endophoric markers, evidential and code glosses. Interpersonal metadiscourse has many functions in language. The writer can express his thought and feelings through it and he can also interpret the content or tell the reader about his attitude toward the propositional content. Considering interpersonal functions, a writer can construct a relation with the reader in the way that he wishes, whether choosing a style with a strong persona or remote stance. The writers can directly refer to the reader; therefore, interpersonal metadiscourse involves the readers into the text and make it more interactional (Hyland 2005b).

In another model, Hyland (2005a) classified metadiscourse into interactive and interactional resources. The first one refers to the resources that show the writer has paid attention to the readers needs and the second one refers to those that help the writer to involve the reader. One element of interactional metadiscourse is engagement markers which will be explained in details in the next part.

Engagement Markers

Hyland (2001) proposed that regarding the positions progressed in the text, writers try to communicate with their readers which he called it "engagement markers". EMs are the components of interactional metadiscourse and by using them, the writers establish a relationship with their readers. Since they are not independent devices and are inherent in the context, the writers cannot use and vary them in any way that they want (Hyland 1998). As mentioned in the previous section, bringing readers into the discourse to anticipate their possible objections and also engaging them in proper ways has gained attention in recent years. Hyland

(2005b) mentioned two reasons for the importance of using the EMs which are as follow:

1. It is essential for the writer to write in a way that meets the reader's expectations of inclusion. For example, readers are addressed with reader pronouns and interjections.

2. It is necessary for the writer to pull the readers into the discourse at critical points, anticipating possible objections through questions and directives.

Writers use five elements to engage their readers in the text:

1. *Reader Pronouns*

2. *Personal Asides*

3. *Appeals to Shared Knowledge*

4. *Directives*

5. *Questions*

1. *Reader pronouns*: Probably, the most obvious way through which the writer can bring the readers into a discourse is by Reader pronouns. The reader's presence and also binding writer and reader together is through using the reader pronouns which includes "you, your, we and our". It is worth mentioning that using "we and our" is more frequent in academic writing. These inclusive pronouns give the readers a sense of membership with similar goals and understandings as the writer (Hyland 2005b). For example:

(1) When there is some trouble with **your** kitchen sink or with **your** toilet that **you** cannot handle **yourself**, **you** are likely to call a plumber.

(Sociology)

2. *Personal Asides*: Personal asides give the writers the opportunity to address readers directly by temporarily interrupting the argument to suggest a statement on what has been said. Such statements often add more to the writer-reader relationship than to the propositional development of the discourse. Since asides present something of the writer's personality and eagerness to overtly intrude to offer a view, they can be considered as a key reader-oriented strategy (Hyland 2005a). For instance:

(2) Psychologists, of course, want a cognitive theory of this vast semantic network, so exploring the network soon became a topic for psychological experimentation. **(But for reasons, I tend to concentrate on nominal concepts and ignore words in other syntactic categories.)**

(Sociology)

3. *Shared Knowledge*: Obviously, writers use shared knowledge to bring the readers in agreement with themselves. This is done by constructing some kind of explicit signals asking readers to understand something as familiar or accepted. But, often these constructions of solidarity involve explicit calls which ask readers to identify with special insights (Hyland 2005b). As we can see, appeals to shared knowledge add more to the writer-reader interaction (Example 3):

(3) This article is **obviously** not a comprehensive report on my intellectual activity.

(Sociology)

4. *Directives*: Directives are used to instruct the readers to perform an action or to view things in the way that the writer intends. Imperatives, obligation modals and adjectives which express necessity/importance are used to direct the readers (Hyland 2005b). For example:

(4) To prove the second statement, **consider** a triple of configurations X` Y` Z.
In fact, writers direct the readers in three kinds of activities (Hyland 2002a)

- a. Textual Acts
- b. Physical Acts
- c. Cognitive Acts

a. *What are textual acts?* When the writer intends to guide the readers metadiscoursally through the discussion and also direct them to the other parts of the text or another text, he uses textual acts.

b. *What are physical acts?* When the writer intends to guide the reader through carrying out research processes and doing some action in the real world, he uses physical acts.

c. *What are cognitive acts?* When the writer intends to guide the readers through a line of reasoning, or get them to understand a point in a certain way, he uses the cognitive acts. So, the most threatening type of directives is cognitive acts.

5. *Questions*: Questions are some sorts of EMs which invite the readers to be engaged in and it can lead them to the writer's viewpoint (Hyland 2002a). In fact, the writer raises a sense of interest in the readers and shares his curiosity through questions. Most of the questions in the corpus are rhetorical and do not require any answer. They are there just for attracting and engaging the readers (Hyland 2005b). For example:

Can the protection of rights be effective if the beneficiary of those rights does not have access to a neutral forum in which to press a claim?

(Law)

Scholars have done some studies on engagement markers and how they are used by different writers, but less is done to quantitatively consider how differently engagement markers are used by writers. Therefore, the present study aims to fill the gap by finding the frequency of different engagement markers which are used in science and Humanities journal articles and the ongoing change of using engagement markers from 1990 to 2010. The researchers, thus, aim more specifically at seeking answers to the following research questions.

1. Are there any significant differences in the type and frequency of engagement markers used in Humanities and Science journals' RAs?
2. Which types of engagement markers are more frequent in Science and Humanities journals' articles?
3. Is there any difference in using engagement markers from 1990 to 1999 and from 2000 to 2010 in Humanities and Science journal RAs?

Literature Review

Metadiscourse is used in writing to describe a word or phrase that comments on what is in the sentence, usually as an introductory adverbial clause. It is any phrase that is included within a clause or sentence that goes beyond the subject itself, often to examine the purpose of the sentence or a response from the author. Firstly, metadiscourse was used by Zelling S. Harris in 1959. Through metadiscourse, he described text elements which comment about the main information of the text. Crismore has defined metadiscourse as “discoursing about spoken or written discourse” (Crismore 1984, 66). In her opinion, metadiscourse gives readers or listeners direction rather than information.

Also, Ädel (2006) has this opinion that metadiscourse should be considered as one sort of reflexivity in language which is the capability of any natural language to refer to or describe itself. So, when the authors are writing, in fact they are writing on two levels. On the first level, their attention is on what it is that they are transferring to the readers (primary/discourse level). On the second level, their attention is on how they are interacting with the readers (metadiscourse level) (Vande Kopple 1985). Also, Urmson (1952) makes a distinction between what has been uttered and the perception and assessment of what has been uttered. Metadiscourse refers to this understanding and assessment, and convinces the textual and interpersonal functions of language proposed by Halliday (1973).

Puleng Thetela (1997) indicates that understanding the content and also the aspect from which the writer wants that content to be interpreted and judged is very important in the reading of academic research articles. Next, the writer should use this knowledge to develop his writing skills in the English for Academic Purposes classroom and beyond. So, Thetela stresses that students should be taught the rhetorical and cultural standards of academic writing in an explicit manner. If these strategies are misunderstood; therefore, they may have a negative effect on the learners' future careers.

There is a common belief that for effective writing, developing an awareness of the reader and the ability to reflect and take advantage of that awareness is of high importance (Nystrand 1986; Kirsch & Roen 1990). The organization of the text is one way that through which the writer can develop this awareness. Principally, any text can be considered as a dialogue between the writer and the reader in which, as Widdowson (1984) proposes, the writer has this responsibility to guide his interaction by enacting the positions of both participants. As mentioned, every reader expects or needs some kinds of information. The talented writer tries to first, anticipate and second, guess that information, and provide it in the text to satisfy the reader. So the text is built up in such a way that answers the anticipated reactions (Thompson 2001).

Hyland (2000) mentions that with the judicious addition of metadiscourse, a writer is able to change a dry difficult text into coherent and reader friendly prose as well as relating it to a given context and conveying his or her personality, credibility, audience sensitivity, and relationship to the message. The view that academic writing is persuasive is not new. It dates back to Aristotle and it has been accepted by the academics themselves. Concerning this issue, some studies have been done.

Hyland (2008) conducted a study to investigate the role of interaction in 240 published research papers from 8 disciplines. He tried to investigate the nature of interactive persuasion. Results suggested that stance markers were more frequent than engagement markers. Directives were much more used in science and engineering papers than those in Humanities and social sciences and most of them were textual, directing readers to a reference rather than informing them how they should interpret an argument. The most frequent engagement markers were reader pronouns and over 80% of these occurred in the soft knowledge disciplines. Over 80% of questions were rhetorical and they aimed to present an idea as an interrogative. But the authors replied to questions quickly.

Another study was done by Hyland and Tse (2004) on the use of metadiscourse in postgraduate dissertations in six disciplines: Applied Linguistics, Public Administration, Business Studies, Computer Science, Electric Engineering, and Biology. Results suggest that Humanities and Social Sciences made use of metadiscourse markers more than non-Humanities disciplines. They also found that the distribution of boosters and engagement markers was equal across six disciplines, but hedges and self-mentions were much more common in the Humanities. Transitions and evidentials were features of Humanities, too. Emphatics were applied more in non-Humanities especially in engineering.

Hyland (1999) studied the use of metadiscourse markers in textbooks and RAs. His focus was on three disciplines of Biology, Applied Linguistics and Marketing. Results revealed that Biology writers used more hedges; evidentials and relational markers were seen more Applied Linguistics texts; and Marketing textbooks contained fewer evidentials and endophorics. He demonstrated that the greatest variation across genres and disciplines was in Biology.

Marketing and Applied Linguistics texts had less variation across genres and both involved much discrepancy in hedges and connectives. There was a significant difference across genres in the use of evidentials and person markers, endophorics and relation markers in Marketing and Applied Linguistics, respectively. In general, differences were attributed more to the genres rather than to disciplines, and textbooks had more disciplinary diversity rather than RAs.

There are a lot of studies which have been done on the use of directives, questions and personal pronouns in RAs, essays, textbooks, etc. For example, Hyland (2002c) investigated the use of directives through a corpus of published articles, textbooks and L2 student essays in 8 disciplines. His findings indicate that directives are used for a wide range of purposes. It is difficult for L2 learners to recognize their readers' expectations. So, he suggests that L2 student writers should write according to their readers' expectations and guiding them through the correct use of directives will help in this regard. In a more detailed and extensive study, Hyland (2002b) worked on the use of questions in a corpus of RAs, textbooks and L2 student essays in 8 disciplines. He found that academic writers use questions widely, because it helps them to address their readers and their expectations in a more straightforward manner. The analysis of students' essays indicated that proficient writers use questions more than less proficient writers.

Dafouz-Milne (2008) listed several contexts such as textbooks, student writings, science popularization advertisements and RAs. He tried to examine the use of metadiscourse in those contexts. In fact, his purpose was to determine the role of metadiscourse markers in the creation and achievement of persuasion. He analyzed a corpus of 40 opinion columns, taken from the time and El Pais newspapers published in England and Spain, respectively, in order to examine the use of textual and interpersonal metadiscursive devices. He also collected the opinions of a group of informants in relation to the effectiveness of metadiscourse in creating persuasion. The results revealed that both types of metadiscourse were applied in English and Spanish newspaper columns, but there were some variations in the use of logical markers and code glosses. The focus of informants was on the significance of a balanced use of both types of metadiscourse, so in this way persuasion could be established and maintained.

In a quantitative study, Hyland (1998) examined metadiscourse markers in 28 research articles and found 373 instances of metadiscourse in each research. In another textual analysis, Hyland (1999) explored metadiscourse markers in 21 textbooks and found 405 instances of metadiscourse markers in each text, around one per 15 words. Hyland concluded that metadiscourse has an important role in communication. As Hyland (2004) indicates, metadiscourse helps authors interact with their audience in order to communicate successfully with them.

Method

1. Corpus

The corpus was compiled to characterize a wide cross-section of academic practice and involved research papers from each of the eight disciplines in the Science and Humanities journal articles and a total of 1113449 words (Table 1). Each discipline was represented by 16 publications of different length (10-25 pages) written by male and female scholars. All instances were carefully analyzed to ensure that they were performing engagement functions and the results normalized per 1000 words to allow a comparison across corpora of different sizes. Science articles involved Mathematics, Physics, Geology, Biology and Humanities articles involved Law, Psychology, Economics and Sociology. The corpus has been applied to study a range of features including personal asides, reader pronouns, appeals to shared knowledge, questions and directives.

Table 1: Text corpora

Disciplines of Humanity	Texts	Words	Disciplines of Science	Texts	Words
Law	16	179850	Geology	16	91710
Economics	16	192350	Mathematics	16	121930
Sociology	16	155509	Physics	16	74282
Psychology	16	200910	Biology	16	96908
Total	64	728619	Total	64	384830

Each corpus is a collection of international journal articles which have been written in English by native and non-native authors. The corpus is valuable since it

gives us information about the frequency of items and how they are used. The information which is gained guides us to see the preferences of members of different disciplines in using language and engagement markers in their arguments.

2. Data Collection

The period considered for data collection is the articles published from 1990 to 1999 and from 2000 to 2010. First, a pool of eight available journals was established. Then sixteen articles in four fields of Humanity and sixteen others in four field of Science were chosen at random from the pool. Random sampling helps us overcome the problem of particularity of writers' styles. The articles had PDF format and the engagement markers were counted in each of the articles to gain the frequency of them. The items which were considered as engagement markers in the study are listed in Table 3.2. All the items which were in literal abstracts, references, quotes, evidential structures or examples were omitted. Then, the data was inserted to an excel file to make its quantitative analysis and statistical treatment possible. In addition, Chi-square statistical tests (Preacher 2001) were used to see whether the differences between observed values were statistically significant or not. The significance level was established at <0.05 .

3. Data Analysis

The analysis is based on Hyland's (2005a) Interpersonal Model of Metadiscourse in which explicit writer-reader interaction is realized by engagement markers. The engagement markers focused in this study involve: 1. personal asides; 2. reader pronouns; 3. Questions; 4. directives and 5. appeals to shared knowledge. What follows is Hyland's (2005a) Interpersonal Model of Metadiscourse in which just the engagement markers are listed:

Table 2: Engagement Markers of Hyland's (2005a, 49) Interpersonal Model of Discourse

Category	Function	Resources
Engagement Markers	Explicitly build relationship with reader	
Reader Pronouns		We, our, you, your, the reader
Directives		Note, see, consider It's important/ necessary/ essential to
Questions		Can you think of a better method?
Appeals to Shared Knowledge		As we saw in the previous section, children should learn to be strong and independent.
Personal Asides		And- as I believe many TESOL professionals will readily acknowledge- critical thinking has now begun to make its mark, particularly in the area of L2.

Results and Discussions

The first research question reads:

1. Are there any significant differences in the type and frequency of EMs used in Humanities and Science journals' RAs?

In order to answer the above question, the EMs used in the Humanities and Science articles were counted and the frequency and their percentages are presented in Table 3. As it can be seen from this table, Humanities articles (51%) involved more EMs than Science articles (49%). Also, it is clear that directives were used more than other markers both in Humanities and Science articles. After directives, questions, reader pronouns, appeals to shared knowledge and personal asides had the highest frequency, respectively. All EMs were more frequent in Humanities articles than Science articles with the exception of directives; directives were more frequent in Science articles.

Table 3: EMs in Humanity and Science Journal Articles

	<i>Engagement Markers</i>					<i>Total</i>
	Pronouns	Directive S	Questions	Appeals to Shared Knowledge	Personal Asides	
Humanity	18.4 %	43.2 %	18.4 %	12.4 %	7.6 %	51%
Science	9.6 %	62.4 %	14.2 %	9.6 %	4.3 %	49%

In order to check whether the differences in two corpora were significant or not, Chi-square test was conducted to compare the use of five categories of EMs in two fields. As Table 4.2 shows, there was a significant difference in the use of EMs in Humanities and Science RAs (N=617, p=0.000, df=4).

Table 4: Chi- square Test for the Use of EM in Humanities and Sciences RAs

N	Pearson chi-square Value	Df	Asymp. Sig.
617	25.055	4	.000

The findings of this study go in line with Hyland (1998) who found that writers of Humanities and Social Sciences' RAs take far more explicitly involved and personal positions than those in Sciences and they create rhetorical patterns that match our intuition, but scientists tend to produce more impersonal or at least, less reader inclusive texts.

Also, the obtained results of the current study are consistent with those of Hyland and Tse (2004) who investigated the use of metadiscourse in six disciplines. Their findings showed that Humanities and Social Science disciplines made more use of metadiscourse than non-Humanities disciplines. But they found that boosters and EMs were almost equally distributed across disciplines which this result is not in line with the results of the present study because the EMs were not equally distributed in eight examined disciplines of the current study.

The second research question reads:

2. Which types of EMs are more frequent in Humanities and Science journals' articles?

2.1. Humanities RAs

To see which categories of EMs are more frequent in Humanities RAs, the frequency of them was calculated. As it can be seen in Table 5, directives were among the highest frequency of the corpus which contained 43.2% of all EMs and personal asides had the lowest frequency which contained 7.6 % of the corpus.

Table 5: Distribution of EMs in Humanities Articles

Humanities	Engagement Markers				
	Pronouns	Directives	Questions	Appeals to Shared Knowledge	Personal Asides
Percentage	18.4%	43.2 %	18.4 %	12.4 %	7.6 %

2.2. Science RAs

To see which sub-category of EMs was more frequent in Science RAs, the frequency of them was calculated. As it can be seen in Table 6, directives had the highest percentage among all the engagement markers (62.4%) and personal asides had the lowest percentage (4.3%).

Table 6: Distribution of EMs in Science Articles

Science	Engagement Markers				
	Pronouns	Directives	Questions	Appeals to Shared Knowledge	Personal Asides
Percentage	9.6%	62.4 %	14.2 %	9.6 %	4.3 %

2.3. Reader Pronouns

Reader pronouns were used more in Humanities rather than Science RAs. To see whether this difference was significant or not, Chi-square test was conducted. As Table 7 shows, this difference was significant (N= 87, p= .002, df= 1).

Table 7: Chi-square Test for Reader Pronouns in Humanities and Science RAs

	N	Chi-square Value	Df	Asymp.sig
Humanities	58	9.667	1	.002
Science	29			

The results of the current study match with those of Hyland (2005a) who conducted a study on the use of stance and EMs across disciplines. He concluded that reader pronouns were more frequent in soft disciplines than hard discipline. In his opinion, reader pronouns appeal to scholarly solidarity. In soft disciplines and Humanities, writers' focus is more on the mutual, discipline-identifying understandings linking the writer and the reader. Probably, by using "we", the

authors aim to include readers and make their texts a collective endeavor which they want to accomplish what they are seeking. In fact, the writers are leading the readers along with themselves. Because writing a text or RA is not just listing some facts, but also it is essential for the writers to get the readers onside, and indicate that they have similar interests and concerns. For accomplishing this purpose, writers use reader pronouns of "we, our, you, your, us, ours".

Different disciplines in this study showed diverse use of reader pronouns. Biology had the lowest frequency in using reader pronouns (0.7 %) and Psychology had the highest frequency in using pronouns (26.3 %). Among the four fields of Science, Physics involved the most use of reader pronouns (18.3 %) and among the four fields of Humanities, Law contained the lowest use of pronouns (3.5 %).

2.4. Directives:

The most frequent EMs used in Humanities and Science RAs were directives. Science RAs involved more directives than Humanities'. To see whether this difference was significant or not, Chi-square test was conducted. As Table 8 shows, there was a significant difference between Humanities and Science RAs in the use of directives (N=324, df=1, p=.003).

Table 8: Chi-square Test for the Use of Directives Across Humanities and Science RAs

	N	Chi-square Value	Df	Asymp.sig
Humanities	136	8.643	1	.003
Science	189			

The results show that the only EM which was used more in Science articles than Humanities' was directives. This result is in line with that of Hyland (2008) who investigated the role of interaction in RAs in 8 disciplines and concluded that directives were much more used in Science and Engineering papers than those in Humanities and Social Sciences. Also, the present study showed that the most frequent sub-category was directives which do not accord with Hyland (2005b) who conducted a study on the use of stance and engagement markers across disciplines and concluded that the most frequent engagement markers were reader pronouns. Also, this is consistent with the results of Swales et al. (1998) who indicated that Science RAs involved more directives than Humanities.

Science articles tend to be more succinct and standard rather than Humanities and directives provide an economy of expression. In addition, writers can express their ideas more clearly through directives. For the purpose of determining the frequency of directives, imperatives, necessity modals and predictive adjectives were examined in RAs. In Science RAs, especially in Mathematics and Physics, writers made use of directives very much. Among Humanities RAs, Psychology and Law had the highest frequency of directives. Among these directives, necessity modals had the highest frequency and imperatives had the lowest frequency. Maybe, this is due to the fact that writers prefer to use gentler forms of directives. Although imperatives had the lowest frequency, Mathematics writers made use of imperatives very much and probably this is related to the nature of Mathematics articles. There

are a lot of instructions in the Mathematics papers and for guiding the readers through the instructions, the writer has to use many imperatives.

2.5. Questions

Questions were used more in Humanities rather than Science RAs. To see whether this difference was significant or not, Chi-square test was conducted. As Table 9 Shows, this difference was not significant (N=101, p=.136, df= 1).

Table 9: Chi-square Test for the Use of Questions Across Humanities and Science RAs

	N	Chi-square Value	Df	Asymp.sig
Humanities	58	2.228	1	.136
Science	43			

This result is in line with that of Hyland (2002a) who found that soft fields use questions more than hard fields. The statistical results are in line with those of Lafuente-Millan (2013) who found that the difference of disciplines in using questions is not statistically significant. Most of the questions presented in the articles were rhetorical. Through this strategy, the writers aimed to attract the readers and they often answered the questions immediately.

There was a disciplinary imbalance with the use of questions. Results showed that RAs in the field of Economics had the highest number of questions (30%) and Physics had the least number of questions (5.5 %). It is probable that the difference arises from the fact that some writers believe that questions are too personal and intrusive, so they avoid too much questions in their works. On the other hand, the reason for using more questions may lie in the fact that writers use direct questions to create a sense of shared curiosity about similar things with readers. Also, some writers think that by asking questions they can relate to their readers. In Humanities RAs, most of the key issues were presented in question forms. It is clear that readers would pay attention to the questions presented at the beginning of the articles and they would look for the answers to those questions through the text.

2.6. Appeals to Shared Knowledge

In Humanities RAs, there were more appeals to shared knowledge (57.3%) than Science RAs (42.6%). To see whether this difference was significant or not, Chi-square test was conducted. As Table 10 shows, there wasn't any significant difference between Humanities and Science RAs in the use of appeals to shared knowledge (N=68, df=1, p=.225).

Table 10: Chi-square Test for the Use of Appeals to Shared Knowledge Across Humanities and Science RAs

	N	Chi-square Value	Df	Asymp.sig
Humanities	39	1.471	1	.225
Science	29			

Among Science and Humanities RAs, Physics writers (24.2%) and Law writers (17.2%) made the most use of appeals to shared knowledge and Biology (5.4%) and Economics writers (8.1%) made the least use of appeals to shared knowledge, respectively. The resources examined for appeals to shared knowledge were "obviously", "as", "of course" and "by the way".

Writers of Scientific RAs expect their readers to have enough knowledge to understand the references to the different parts of the paper, so they use fewer appeals to shared knowledge resources rather than Humanities writers. Here is an example of appeals to shared knowledge:

We can analyze them and give prescription for how they emerge, but **obviously** we cannot give rise to them without first giving rise to appropriate brain structures and their dynamics within the body of an individual organism.

(Psychology)

2.7. Personal Asides

In Humanities RAs, there were more personal asides than Science RAs. To see whether this difference was significant or not, Chi-square test was conducted. As Table 11 shows, there was not any significant difference between Humanities and Science RAs in the use of personal asides (N=37, df=1, p=.071).

Table 11: Chi-square Test for the Use of Personal Asides Across Humanities and Science RAs

	N	Chi-square Value	Df	Asymp.sig
Humanities	24	3.270	1	.071
Science	13			

Among Science and Humanities RAs, Mathematics (33%) and Psychology (24.5%) articles had the most use of personal asides and Biology (2.2%) and Law (2.6%) contained the least use of them, respectively. The personal asides examined in this study were the statements uttered by the writers to express their personal opinions. These statements were placed between two dashes (_ _) or in parentheses (). Such statements were added to the interpersonal relationships. Here is an example of personal asides:

I was firmly imbued with the sociological perspective even before entering the "practice" of market researcher (**As a wife I then simply accepted whatever occupational opportunities arose**).

(Sociology)

The third research question reads:

3. Is there any difference in using EMs in 1990 to 1999 and 2000 to 2010 in Humanities and Science RAs?

(a) Humanities RAs

In order to answer the above question, the engagement markers used in the Humanities articles of the two decades were counted and the frequency and percentage of them are presented in the following table (Table 12).

Table 12: EMs in Humanities RAs in Two Decades of 1990s and 2000s

<i>Humanities</i>	<i>Engagement Markers</i>					<i>Total</i>
	Pronouns	Directive S	Questions	Appeals to Shared Knowledge	Personal Asides	
1990s	45.8 %	27 %	88.1 %	41 %	44 %	44.8%
2000s	54.2 %	73 %	11.9 %	59 %	56 %	55.2%

As it can be seen from the above table, there is an increase in the use of engagement markers in the second decade. In the 1990's, the overall usage of engagement markers were 139, while in the 2000's, this amount increased to 176. To check whether this difference in two decades was significant or not, Chi-square test was conducted to compare the use of five engagement markers including pronouns, directives, questions, appeals to shared knowledge and personal asides in 1990's and 2000's. As table 13 shows, there was a significant difference in the use of EMs in Humanities RAs in two decades (N=315, p=0.000, df=4).

Table 13: Chi-square Test for the Comparison of EMs in Humanities RAs from 1990 to 2000 and from 2000 to 2010

N	Pearson Chi-square Value	Df	Asymp. Sig.
315	62.589	4	.000

(b) Science RAs

To check whether there is any difference in using EMs in 1990 to 1999 and 2000 to 2010 in Science RAs, they were counted and the frequency and percentage of them are presented in the following table.

Table 14: EMs in science RAs in two decades of 1990 and 2000

<i>Science</i>	<i>Engagement Markers</i>					<i>Total</i>
	Pronouns	Directive S	Questions	Appeals to Shared Knowledge	Personal Asides	
1990	65.5 %	45.3 %	32.6 %	46.7 %	92.3 %	47.5%
2000	34.5 %	54.7%	67.4 %	53.3 %	7.7 %	52.5%

As it can be seen from the above table, there is an increase in the use of EMs in the second decade. In the 1990's, the overall usage of EMs were 143, while in the 2000's, this amount increased to 160. To check whether the differences in two decades were significant or not, Chi-square test was conducted to compare the use of five EMs including pronouns, directives, questions, appeals to shared knowledge and personal asides in 1990's and 2000's. As table 15 shows, there was a significant difference in the use of engagement markers in Science RAs in two decades (N=303, p=.001, df=4).

Table 15: Chi-square Test for the Comparison of EMs in Science RAs from 1990 to 2000 and from 2000 to 2010

N	Pearson Chi-square Value	Df	Asymp. Sig.
303	18.479	4	.001

The findings of this aspect of the study are in line with Hyland (2005a). He claimed that traditional academic writing had an objective, faceless and impersonal form of discourse, but over the past decade, it has taken a new form to itself and it is like a persuasive struggle to create an effective interaction between writers and readers. Maybe, this is related to the fact that writers of RAs in different disciplines are trying to attract more readers and also they attempt to popularize their texts by engaging more readers.

Conclusion

The analysis undertaken here intended to contrastively examine the engagement markers in Humanities and Science RAs. Since, it is claimed that recently, writers are trying to use more engagement markers in their texts, an attempt was also made to study the differences in the engagement markers in two different decades of 1990's and 2000's. Chi-square test was conducted and the results obtained from data analyses showed that Humanities RAs contained more engagement markers than Science RAs. Through using these markers, writers of Humanities may try to attract and engage more readers. This result can be related to the fact that Humanities writers take a more personal position and are more explicitly involved, so they produce rhetorical patterns that match readers' intuition; but Science writers produce less reader inclusive and more impersonal texts. In scientific RAs, readers are familiar with prior texts and findings. So they rely more on shared knowledge and proven methods and a strong interpersonal relationship with the addressees is not necessary in their texts. But Humanities writers try to persuade their readers and engage them by using more engagement markers.

Also, results showed that directives had the highest frequency for both Humanities and Science RAs. It can be related to the fact that writers can express their ideas more clearly through directives. Furthermore, Humanities and Science RAs involved more engagement markers in 2000's decade compared to 1990's. Compared to traditional writings, recently, writers are trying to use more engagement markers. In the past, there was a framework for writing and writers produced faceless and objective texts. The current study confirmed that Humanities and Science RAs writers are trying to engage their readers more than past. They use more directives, questions and appeals to shared knowledge to be more effective and persuasive. Today, there is a wide range of publications of research articles compared to past. Readers have choices in selecting and reading these articles. So, writers should be aware of engagement markers and try their best to attract more readers by engaging them and making a writer-reader relationship.

This study has attempted to show how Humanities and Science RAs interact with their readers in their texts through engagement markers. EMs and their variation across disciplines would make an interesting topic of investigation into

English for Academic Purposes (EAP) classes. One of the most obvious implications that this study has for writers and practitioners of EAP materials is that course materials focusing on engagement markers need to become corpus-based. Therefore, the findings of this study suggest that the most effective way of raising author's awareness of the role that engagement markers have to play will be for the EAP teachers to design their own corpus-based syllabuses.

Like any other empirical studies, the current work contains some potential limitations. The first limitation is related to the limited accessibility to journal articles. Most of the journals were not open-accessed, so the pool of journal for random selection contained just eight journals for eight disciplines. A second major limitation of the study is the lack of accessibility to writers and interviewing them. Interviewing writers gives us a more valid result, because establishing what statements and ideas can be considered as shared by disciplinary members can be highly problematical (Hyland 2001b), especially for a discourse analyst who is not a member of this discipline. Similarly, other signals of shared knowledge mentioned by Hyland (2001b), such as preferred metaphors, familiar argument structures or citation practices are equally difficult to recognize by disciplinary outsiders, which makes their quantitative analysis rather unreliable.

It is a fact that no research is complete in its own right. Despite the implications of the present study for language syllabus designers and EAP language teachers, there are some related issues which need further research. Further studies investigating the same research questions with a larger group of disciplines or across genders would provide more useful insights for those concerned with engagement markers.

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HOW TO CITE THIS ARTICLE

R. Sahragard & S. Yazdanpanahi, (2017). English engagement markers: a comparison of Humanities and Science Journal Articles. *Language Art*, 2(1):111-130, Shiraz, Iran.

DOI: 10.22046/LA.2016.06

URL: <http://www.languageart.ir/index.php/LA/article/view/14>



مقایسه نشانگرهای درگیرکننده انگلیسی در مقالات رشته های علوم انسانی و علوم محض

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(تاریخ دریافت: ۳۰ آذر ۱۳۹۵؛ تاریخ پذیرش: ۲۶ دی ۱۳۹۵)

نشانگرهای درگیر کننده از عناصر مهم زبان هستند که خواننده را درگیر تعامل با متن می کنند. علی رغم اهمیت آنها کار تخصصی زیادی جهت مقایسه آنها در متون علوم انسانی و علوم محض صورت نگرفته است. مطالعه حاضر تحلیلی کمی و کیفی از مقالات چهار رشته در علوم انسانی (روانشناسی، جامعه شناسی، اقتصاد، و حقوق) و چهار رشته در علوم محض (ریاضیات، زمین شناسی، فیزیک، و زیست شناسی) از نشانگرهای درگیر کننده در زبان انگلیسی ارائه می دهد. از هر رشته ۱۶ مقاله به طور تصادفی انتخاب شدند. در همه ی قسمتهای مقالات نشانگرهای درگیر کننده جستجو و مشخص شدند. سپس آماری از آنها تهیه شد و مقایسه گردید. نتایج نشان داد که میزان استفاده از نشانگرها در علوم انسانی بطور معناداری از علوم محض بیشتر است. همچنین مشخص شد که از سال ۱۹۹۰ تا ۲۰۰۰ استفاده از این نشانگرها در مقالات هر دو علم افزایش یافته است.

واژگان کلیدی: نشانگرهای درگیر کننده، علوم انسانی، علوم محض، مقاله.

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