

Metadiscourse Markers in Introduction Sections of Persian and English Mining Engineering Articles

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Abstract

The present study aims to examine cultural variations in the use of metadiscourse between Iranian mining engineering's research articles and their English counterparts. Hyland's (2005) taxonomy was adopted as a framework and the corpora in the present study comprises a total of 68 articles written in English, 34 articles from native English researchers and 34 from Iranian researchers. The analysis showed that there were some cultural differences in the amounts and types of metadiscourse markers. The occurrence of interactional metadiscourse markers in the English corpus was generally more than the Persian corpus. However, hedges were more frequently in Persian corpus than the English one. On the other hand, self mentions and attitude markers were used frequently in the English corpus. Nevertheless, apart from self mentions, there was not any significant difference in the application of interactional metadiscourse markers between in the two corpora. Significant differences in the use of intractional metadiscourse markers could imply the influence of Persian writers' cultural identity. The use of evidential and transition devices in the Persian corpus was higher than that of English corpus, whereas English authors use frame markers and code glosses more than their Persian counterparts. The findings show significant differences in the case of code glosses and evidentials. The utilization of boosters, engagements, and endorphics were approximately the same across corpora. Finally, attitudes and self mentions were the less frequent metadiscourse markers in both corpora and this may be related to the nature of hard sciences because they are considered as objective and unbiased.

Key words: Interactional metadiscourse markers, Interactive metadiscourse markers, , Mining engineering

1. Introduction

The prevalent purpose of evaluation for different subfields of English research is the academic discourse. Academic discourse has been considered as objective and unbiased in most of conventional research. A vast majority of these studies have instructional implications based on student needs and capabilities. However, this idea has slowly been substituted by an understanding of academic writing as social involvement, requiring interactions between writers and readers (Hyland, 2004). Writers and readers apply interpersonal devices to manage texts coherently and to express their credibility, identity, reader reactivity and connection to the message.

A great many of the text analysis research has been carried out during recent years. Among them, several studies have tried to illuminate features of distinct genres or text types regarding structural, discoursal, and metadiscoursal characteristics. Metadiscourse is newly arrived concept in the field of text analysis. Even though having been verified from various aspects recently, metadiscourse is still a new concept to many of those who are engaged in the area of hard sciences such as mining engineering. Therefore, it merits more examination and deserves extensive research.

Language is applied to talk not only about the society and individuals, but also to *talk about talk*. We sometimes are as experiencers in the society, but also as reporters. We may also reflect on the setting of reporting in addition to the topic of setting (Ädel, 2006). Language is used to represent information through the arrangement of the text itself and involve readers as to how they should grasp it (Fuertes-Olivera, Sacristán, Baño, and Fernández, 2001). This is what metadiscourse engages itself with. In consideration of analyzing a text, researchers may verify metadiscourse component based on their forms, meanings or functions among which functional research has been more commonly used.

1.1. Metadiscourse

Vande Kopple (2012) identified four reasons why the study of metadiscourse is captivating and necessary: (a) Such research reveals how intricately organized language is; (b) Such study opens up interesting issues about ethics and language use; (c) Such study shows distinctions in how metadiscourse is applied in similar texts in different languages; (d) And such study provides justifications why metadiscourse merits a particular place in second-language pedagogy.

Simply put, metadiscourse is an umbrella term that alludes to a collection of self-reflective terms applied to discuss interactional meaning in a text, helping the composer to represent a viewpoint and involve with readers as members of a specific society (Hyland, 2005). As reported by Hyland, applied linguists, composition theorists, and rhetoricians agree on applying metadiscourse to allude to different linguistic tokens carried out to conduct or orient a reader via a text so that both the text and the composer's stance is perceived. Metadiscourse in the common and interactional aspect of it especially is of great importance in that it faces culturally accessible choices. In point of fact, metadiscourse is unavoidably connected to the writers' state of mind and it sounds that it is completely questionable to discard such attitudes and follow the conventions and mentalities of pertinent discourse communities.

According to Vande Kopple (1985) and Crismore (1989) writing encompasses two areas: discourse area and metadiscourse area. On the first dimension, the reader is supplied with propositional content and on the second dimension; the reader is directed via the text. Metadiscourse alludes to the pragmatic appliance of language to mention reflexively on discourse itself. Metadiscourse changes the locus of consideration of continuous communication, extend some aspects of discourse to a context or frame planned to affect the meaning and pragmatic behavior of communication. Metadiscourse is a concept which reports a variety of open class lexical features (words and expressions), each one has a comparatively fixed practical role, and whose specific work is to increase communicative effectiveness. It has been central in academic prose, as a way of guiding English speakers to convey their viewpoints and involve with their readers efficiently. With the enhancement of discourse analysis as a main instrument in understanding language use, the significance of interaction in writing essentially in speech has come to be ever clearer, and metadiscourse has appeared as a way of bringing these interactional items to eminence. By anticipating their audience's expectation, interests, capabilities, needs, and wants authors attempt to involve them in their texts and affect their understanding (Hyland & Tse, 2004; Hyland, 2005).

There are two main approaches that hold the term rhetoric: *generative rhetoric* which was cultivated under the power of Noam Chomsky's transformational generative grammar, and the other that is the major consideration of this research, as *contrastive rhetoric* (Malmkjær, 2009). Contrastive Rhetoric is a current state of research of composing across cultures which emerged in the last 1960's. The author and pathfinder researcher was Robert B. Kaplan, who advanced the idea that language and writing are cultural fact and that all languages have their own cultural norms. The results of his examination motivated him to speculate the existence of distinct *thought patterns* for distinct languages/cultures. Sharing a similar theory with the Sapir-Whorf's assumption of the connection between language and culture, Kaplan's prior efforts investigate a connection between culturally specific reasoning or thought patterns and paragraph construction in English essays composed by nonnative speakers of English.

The metadiscourse concept was invented by Selling S. Harris in 1959 to present a way of comprehension language in use, showing a writer's or speaker's efforts to direct a receiver's perception of a text (Hyland, 2005). He invented the word "metadiscourse" to better show the practical connection between writer and reader several decades ago (Beauvais, 1989). In reporting such meanings, Vande Kople moves behind Halliday (1973), who has indicated that when people apply language, they generally work in the direction of fulfilling three macro-functions. They attempt to offer a declaration to their experience, to communicate with their audience, and shape their declaration into cohesive discourses that their audience can build a coherent sense of. Otherwise stated, Halliday (1973) declared that people interact with messages that are united declarations of three different sorts of meaning, which he use ideational, interpersonal, and textual terms (as cited in Vande Kopple, 2012).

Referential meaning is corresponding to what Halliday (1973) names additional meaning. Vande kopple (1985) proposes that sort of metadiscourse carry interpersonal or textual meanings. Interpersonal metadiscourse helps writers declare their personalities, display their judgments and mentalities toward ideational function, indicate what role in the communication setting they are selecting, and show how they expect readers will answer to the ideational function. Textual

metadiscourse aid writers indicate how they make connection between bits of ideational material in a text and how that text proves out in a specific setting. Vande Kopple (1985) and Crismore (1989) have developed the concept and gather together a variety of discoursal items such as connectives, hedges and different types of text commentary to indicate how writers and speakers permeate into their narrated text to affect their interlocutor's reaction of it (Hyland, 2005). However, Hyland (2004, 2005) and Hyland and Tse (2004) suggested a more cogent interpersonal idea of metadiscourse: “all metadiscourse is interpersonal in that it takes account of the reader’s knowledge, textual experiences, and processing needs [...]”(p. 161). Consequently, they abandon the Hallidayan textual and interpersonal levels of discourse and adopt Thompson’s (2001) clarification of interactive and interactional means assuming as two inter-connected forms of interaction. In accordance with this view of metadiscourse, academics' discourse selections via the text are reinforced out of the connection between the writer(s) and their coequals within a specific discourse society. Accordingly, both interactive metadiscourse items (looked for arranging the material pertaining to the readers’ needs and beliefs) and interactional metadiscourse items (sought to illustrate the academics as authors and to integrate writer and reader together) are a response to the interpersonal component of writing. Applying metadiscourse enables scholars to comprehend discourse texture and intertextuality, to allocate practical presumptions, to deduce planned meanings, and to clarify the institutional and ideological links central to the text (Pérez-Llantada, 2003). Nonetheless, discarding metadiscourse items would make the passage much more impersonal, and more difficult to follow. As metadiscourse markers are pertinent in directing the explanation of text, meanings are not easy to spell out. Therefore, research on the way metadiscourse markers are applied, can denote to our comprehension of their meanings and proper operation.

1.2. Selected studies

In the past few years, several components of language have drawn out more research from literature in different pertinent academic disciplines than having components that can be categorized as metadiscourse. Literatures involved in the research of metadiscourse include fields such as linguistics, applied linguistics, discourse analysis, rhetoric, second-language theory and pedagogy, and pragmatics (Vande Kopple, 2012). The re-evaluated model was introduced by Crismore, Markkanen, and Steffensen (1993) comprises two main classifications of textual and interpersonal were considered the same, but the subclasses analyzed, separated, and rearranged. Furthermore, the textual metadiscourse comprises two classifications of “textual” and “interpretive” markers so as to separate organizational and evaluative objectives. Textual markers contain items that can aid the discourse to be arranged, and interpretive markers simplify readers' awareness and comprehension of the writer’s objective and writing approaches.

In a study on research articles, Hyland (1998) evaluated four academic fields to show how the proper appliance of metadiscourse critically is based on the rhetorical situation. The research introduced categorization of metadiscourse elements and showed that metadiscourse explains one way in that context and linguistic meaning are combined to permit readers to obtain purposive explanations, also metadiscourse supply authors with a means of creating proper contexts and refer to a shared disciplinary hypothesis. Hyland (1999) investigated the feasible role of college textbooks in the students’ acquisition of a certain disciplinary literacy. The results indicated that the ways textbook writers presented themselves, arrange their arguments, and show their mentalities to both their declarations and their scholars vary considerably in the two corpora. It is

indicated that these distinctions mean that textbooks represent restricted rhetorical guidance to students looking for information from research references or learning proper modes of written argument. Fuertes-Olivera et al., (2001) evaluated metadiscourse devices applied by authors to build their mottos and headings in selected women's magazines. The results indicated that both textual and interpersonal metadiscourse aid authors carry an influential message under an educational disguise.

Hyland (2004) examined the appliance and assessment of metadiscourse in doctoral and masters dissertations composed by Hong Kong students. The research suggested a model of metadiscourse as the interpersonal resources needed to show propositional material properly in distinct disciplinary and genre situations. The analysis proposed how academic authors apply language to suggest an acceptable representation of themselves and their function in distinct disciplines, and therefore how metadiscourse can be understood as a way of unfolding something of the rhetorical and social discreteness of disciplinary societies.

Dafouz-Milne (2007) explored the role of metadiscourse markers in the creation and achievement of persuasiveness. 40 attitude columns, 20 in Spanish and 20 in English elicited from two best newspapers, the British *The Times* and the Spanish *El Pais*. The findings showed that both interpersonal and textual metadiscourse devices are available in Spanish and English newspaper columns, but that there is dissimilarity as to the spread and composition of such markers, particularly regarding specific textual classifications (i.e. logical markers and code glosses).

Ozdemir and Longo (2014) investigated cultural variations in the use of metadiscourse between USA and Turkish postgraduate students' abstracts in MA theses composed in English. The study was conducted on the corpora comprised a total of 52 thesis abstracts composed in English from the department of English Language Teaching, 26 from Turkish students and 26 theses from USA students. They showed that the occurrence of endophorics, evidential, boosters, code glosses, self-mentions, attitude markers, were fewer in Turkish students' master thesis abstracts. However, Turkish students used frame markers, hedges, and transitions more than USA students

Several studies in the metadiscourse discipline are conducted in the Iranian context. Marandi (2000) evaluated the introduction and discussion chapters of 30 master's theses composed after 1990 by English-speaking and Persian-speaking graduate students. Examination of the first 1000 words in each chapter showed that textual metadiscourse category was applied significantly more in the introductions, but that interpersonal metadiscourse category was applied more in the discussion chapters. Additionally, the data indicated that, of all groups, the Persian native speakers applied text/logical connectors the most whilst the native English speakers applied them the least (as cited in Crismore & Abdollahzadeh, 2010).

Abdollahzadeh (2003) investigated discussion and conclusion chapters of 65 papers (32 papers by English native speakers and 33 by Iranian scholar writing in English), reported between 2000-2002 in the discipline of English Language Teaching (ELT). The data showed a statistically notable contrast between native and non-native authors in their appliance of interpersonal metadiscourse. Certainty and attitude markers are applied by the Anglo-American authors more than the Iranian authors.

In another study, Rahimpour and Faghih (2009) investigated 90 discussion chapters of applied linguistics papers. Hyland's (2004) model was adapted on three kinds of texts: English texts written by Iranians (as non-natives of English), Persian texts written by Iranians English texts written by native speakers of English, and suggested that native speakers of English applied more interactional metadiscourse than the Iranians did. Iranians applied frame markers and code glosses, more than their English counterparts. Comparing both groups of Iranians, Rahimpour and Faghih (2009) found that attitude markers, code glosses, evidential, and self-mentions engagement markers were applied more when Iranians composed in Persian. In addition, transitions, endophoric markers, hedges, frame markers, and boosters were applied more when they composed in English.

Pooresfahani, Khajavy and Vahidnia (2012) in a study on interactive and interactional metadiscoursal items of English papers in applied linguistics and engineering considering Hyland's (2005) model suggested that writers in both groups applied interactive and interactional items in their research articles. Engineering authors applied more endophoric markers, code glosses and less topicalizers and sequencers than applied linguistics authors. There was a notable contrast between the two groups in appliance of evidential and logical markers. Considering interactional metadiscourse, engineers applied more self-mentions and hedges, and less boosters and attitude markers than applied linguistics writers.

Siameh and Abdi (2012) investigated the use of metadiscursive items among Iranian writers of RAs from social and natural sciences. He suggested that interactive metadiscourse is employed four times more than the interactional ones which is a significantly different proportion in contrast with native English writers. He concluded that the various usage at work among Iranian writers in the appliance of metadiscursive strategies in the two recognized branches of science shows the inherent difference in the nature of the two sciences, while the difference between Iranian and English authors corroborate the claim indicate that the national culture is an influencing factor (Dahl, 2004) in controlling the linguistic and rhetoric selections among academia.

Ebadi, Rawdhan Salman, and Ebrahimi (2015), conducted a study on the use of methadiscourse markers in Persian and English Academic Papers in the field of geology. In this study the corpus included 30 papers, 15 English articles composed by Native Persian (NP) Geology researchers and 15 English articles composed by Native English (NE) geology's researchers. They showed that the native Persian writers used more interactive metadiscourse devices than the interactional ones in the argumentative chapters of their RAs. Nevertheless, native English writers used more interactional metadiscourse markers than the interactive metadiscourse features in the discussion and conclusion chapters of their research articles.

Because of the significance of a relatively new concept of metadiscourse, metadiscourse studies have not received the justifiable notice (Crismore & Abdollahzadeh 2010). However, based on above-mentioned discussion a number of studies have analyzed metadiscourse in applied linguistic papers, social, political sciences and ELT books, however, there is no study on the use of metadiscourse markers comparing native and non-native speakers' academic writing in the field of mining engineering in English and Persian. Considering this gap in the literature, in the current research, metadiscourse changes across cultures were investigated when English is used by native

speakers of English and non-native speakers (Iranian), and, therefore, what the variations be inclined to be.

2. Research questions

In keeping with the purpose of the research the following research questions are addressed:

1. Is there any difference in the amount of metadiscourse markers used in English mining engineering texts written by native English writers and their Persian counterpart as non-native writers of English.
2. Is there any difference between the types of metadiscourse markers employed in English mining engineering texts written by native English writers and their Persian counterpart as non-native writers of English?

3. Methodology

3.1. Corpus

The corpus consists of 68 mining engineering articles were taken from five journals: International Journal of Mining Science and Technology, International Journal of Damage and Mechanics, International Journal of Rock Mechanics and Geotechnical Engineering, International Journal of Rock Mechanics and Mining Sciences, and Coal Geology. These articles, published during the period of 2013 -2015. All the articles were accessible online. Chosen articles had at least one native speaker, author (judged by affiliation). The reason that articles were chosen in this discipline was the familiarity of the author with the discipline and evasion of possible misunderstandings.

The articles constituted 2 corpora of 34 articles which were labeled as:

- English group: Articles written in English by native speakers of English.
- Persian group: Articles written in English by Persian authors as non native speakers of English.

3.2. Data Collection Procedure

Data collection procedure includes two steps: First, the introduction section of each 68 chosen articles was selected, due to the fact that metadiscourses analyses are sensitive to the number of words, then we copied all introduction sections of the English and Persian groups in the two word documents separately. Then by eliminating the words from longer corpora made them equal.

Second, the metadiscourse markers, regarding Hyland's (2005) taxonomy, were identified, classified, and analyzed. It should be considered that Hyland's model was preferred for being recent, clear, simple and overarching (Abdi, Rizi & Tavakkoli, 2010). Regarding this model, we classified the metadiscourse elements in the English mining engineering texts into two classes: interactive metadiscourse markers and interactional metadiscourse markers as follows:

3.3. Coding scheme

Hyland's (2005) model comprises two broad categories: 1) *Interactive metadiscourse markers* help the writer arrange the propositional information to present his/her desired interpretations. 2) *Interactional metadiscourse markers* orient the reader toward the discourse and supply them with opportunity to contribute to it and react to it by alerting them to the writer's viewpoint on propositional information and orientation and intention regarding that reader's .

3.3.1. Interactive Metadiscourse

There are five interactive items, that are concisely defined and exemplified below:

1 .Code glosses provide extra explanations by rephrasing, explaining, or illustrating. They show the writer's hypothesis about the reader's cognitive environment. Examples: *called, in terms of, subsequent, defined as, e.g., in other words, specifically, available*

2 .Endophoric markers allude to other parts of the text in order for making additional information available, supporting arguments, and therefore steer the reader toward a desired interpretation. Examples: *(in) (this) Chapter; Figure X, page X, see Section X, as noted earlier*

3. Evidentials are metalinguistic accounts of another source and aid to establish authorial command of the subject. Examples: *(to) according to X, quote X, according to X*

4 .Frame markers are employed to sequence parts of the text or arrange arguments in the text. They have four specific aims:

- to sequence — *(in) Chapter X, first, next, lastly, I begin with, I end with*
- to label stages — *at this point all in all, in conclusion, by far, on the whole, in conclusion*
- to announce purposes — *objective is to, I seek to, my focus, goal, intend to, would like to*
- To shift topic — *, return to, back to, in regard to, turn to, well, resume*

5. Transition markers are essentially conjunctions and conjunctives that aid the readers establish the rational relationships between propositions. Authorities have suggested a number of classifications, including Halliday and Hasan (1976):

- causal — *therefore, as a result, it follows that*
- additive — *similarly, moreover, for example* (also an endophoric markers).
- temporal — *first, second, next, then, finally*
- adversative — *however, that being said, nevertheless*

3.3.2. Interactional Metadiscourse

There are five interactional types of metadiscourse too.

1. Attitude markers show the writer’s viewpoint or assessment of a proposition. Instances: *I agree, I am amazed, admittedly, unfortunately, correctly, dramatic, hopefully, appropriate*

2. Self-mention explicitly refer to the author. Examples: *the author, I, we*

3. Engagement markers explicitly make the connection with the reader. Examples: *imperative mood, we, our (inclusive)*

4. Hedges indicate the writer’s decision to recognize other voices, viewpoints or feasibilities and be (ostensibly) open to discuss with the reader. Examples: *will, must, would, may, be sure, indicate, believe, tend, appear, think, often, sometimes, usually, it is important to be, it is useful to study, apparently, doubt, assume, estimate, from my perspective, in most cases, in my opinion, probably, suggests*

5. Boosters highlight certainty and close dialogue. Examples: *it is an established fact, it is clear that, beyond doubt, clearly, definitely, we proved we found.*

4. Result and discussion

As illustrated in Table 1, there were differences in the number and frequency of interactive metadiscourse. Iranian writers used evidential and transition markers more than native English writers. However, native English writers employed frame markers, code glosses and endorphic markers more than their Iranian counterparts. Nevertheless, when research articles are full of tables, lists, and diagram, then they require more frame and endophoric devices. Greater appliance of these markers in such articles as compared to other articles could not denote identity variations. While there are more tables, figures, lists, etc., more frame and endorphic markers would be applied.

Table 1

The number and frequency of Interactive metadiscourse markers

	Persian		English	
	Number	Frequency	Number	Frequency
Code glosses	171	44.53	213	55.46
Endorphics	32	47.05	36	52.94
Evidentials	772	55.18	627	44.81
Frame markers	107	45.92	126	54.07
Transitions	828	52.30	755	47.69

In the case of interactional metadiscourse English writers applied self mentions and attitude markers more than Iranian writers. The appliance of self mentions by native English writers was three times more than that of Persian writers. The use of hedges in

the Persian group was more than English group (as illustrated in Table 2). However the utilization of engagement and boosters between two groups were roughly the same

Table.2

The number and frequency of interactional metadiscours

	Persian		English	
	Number	Frequency	Number	Frequency
Attitudes	9	37.5	15	62.5
Self mentions	12	22.2	42	77.7
Engagements	54	52.42	49	47.58
Hedges	263	48.43	280	51.57
Boosters	129	50.58	126	49.41

Nevertheless, the use of interactive metadiscourse in the Iranian group was more than English group with frequencies of 52 and 48 respectively. On the other hand, the English group applied intractional metadiscourse more than the Persian group with frequencies of 51 and 49 respectively.

Considering the evidential markers, it is undeniable that citation is “a key element of persuasion in academic writing” (Hyland, 2010). Since citation in scholarly writing, according to Hyland, provides rationale for arguments and assists to display originality, especially in the high stakes article. Further, regarding the exact nature of the hard science fields such as mining engineering the researchers often “rely more on clear criteria to establish or refute the hypotheses” (Yang, 2014 : 64). Furthermore, as Yang (2014) argued, because knowledge in this field assumed to be relatively structured, cumulative, and analytical to set up empirical uniformities, it is reasonable that the hard science researchers employ evidential markers as a common device for supporting and organizing their arguments.

However, based on our findings, there is a significant difference in the use of evidentials between two groups. It means that Persian mining engineers applied evidential markers more than English mining engineers (table 3, $\chi^2=15.02$). This finding is in contrast with the Abdi (2012), Ebadi, Rawdhan Salman, and Ebrahimi (2015) and Rahimpour and Faghih (2009)’s results and show that Iranian authors, as non native writers of English are completely aware that evidentials give plausibility and quality to their propositions and that without them a research article could be really queried, if not directly dismissed.

Tabl3 3

Chi-square test for evidential markers

Observed N	Expected N	X ²	df	sig
772	699.5	15.029	1	0.000
627	699.5			

Code gloss devices reflect the restating of ideational information (Hyland, 2010). Also, Code Glosses as elaboration instruments illustrate how composers project themselves into their

discourses by reflecting their attitude towards both the audience and the content of the text. That is to say, exemplification and reformulation not only assist the writer's position and contribute to communicative validness, but also structure the means by which s/he is capable to connect a text to a given interactive and social setting. By making the rhetorical selections of this type, authors also reflect their judgments about readers. They transmit an understanding of a community and how they desire to position themselves in this community by transferring audience-sensitivity and signaling a relationship to the message and to the readers (Hyland, 2005).

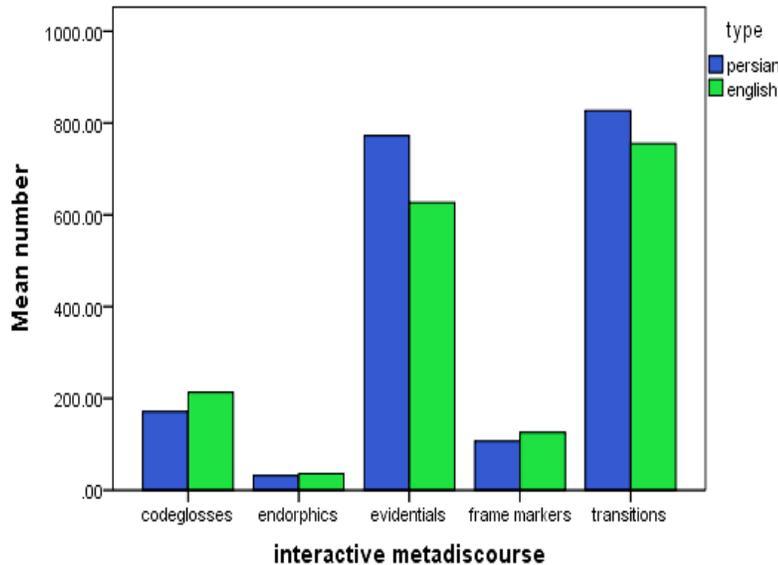
However, in this study native mining engineering authors use reformulation and exemplification more than Iranian scholars to elaborate the propositional meaning and there is a significant difference in the use of code glosses with the χ^2 value of 4.594 (table4). This is in line with Abdi (2012), Ebadi, Rawdhan Salman, and Ebrahimi (2015), Rahimpour and Faghih(2009) and Ozdemir and Longo (2014)'s findings.

Table4

Chi-square test for code glosses				
Observed N	Expected N	X ²	df	sig
171	192	4.594	1	0.032
213	192			

Regarding interactive metadiscourse, unlike the findings of Zarei and Mansoori (2007), Persian and English authors roughly equally took advantage of interactive metadiscourse (52 and 48 per cent respectively). However, the χ^2 value of 0.09 shows that there is any significant difference regarding interactive metadiscourse between two groups. Thus, in line with Rahimpour and Faghih (2009) ,Abdi (2012) and Pooresfahani, Khajavy, and Vahidnia (2012), writers in both corpora make explicit the connection between two independent discourse units nearly equally. The use of interactive metadiscourse in the two corpora is illustrated in Figure 1.

Figure 1. Interactive metadiscourse in English and Persian corpus



Considering interactional metadiscourse, English mining engineers used them more than Iranian mining engineers, with frequencies of 51 and 49 percent respectively. But, there is not significant difference in the use of interactional metadiscourse between two groups ($\chi^2= 5.1, p < .05$). However, there is a significant difference in the use of self mentions. A feasible explanation for this result can be Iranian students' lack of awareness of controlling the level of personality in their arguments, such as the expression of self mentions. It is in accordance with the outcome of Ebadi et al., Ozdemir and Longo (2014), and many others. Self-mentions provide self-references and self-citations. It indicates that English authors explicitly make reference to themselves more than Persian writers. Another possible explanation can be due to some cultural issues. Iranian people tend to be indirect (Kaplan, 1966; Hofstede, Hofstede & Minkov, 1991; Abdi 2012). According to Hyland (2002) Persian writers move behind the positivist's advice to maintain their prose impassive and impersonal, thus, Iranian authors presumably regard self mention as an inappropriate approach while English writers perceived more comfortable using self-mentions.

Table 5

Square test for self mention markers				
Observed N	Expected N	χ^2	df	sig
42	27	16.66	1	0.000
42	27			

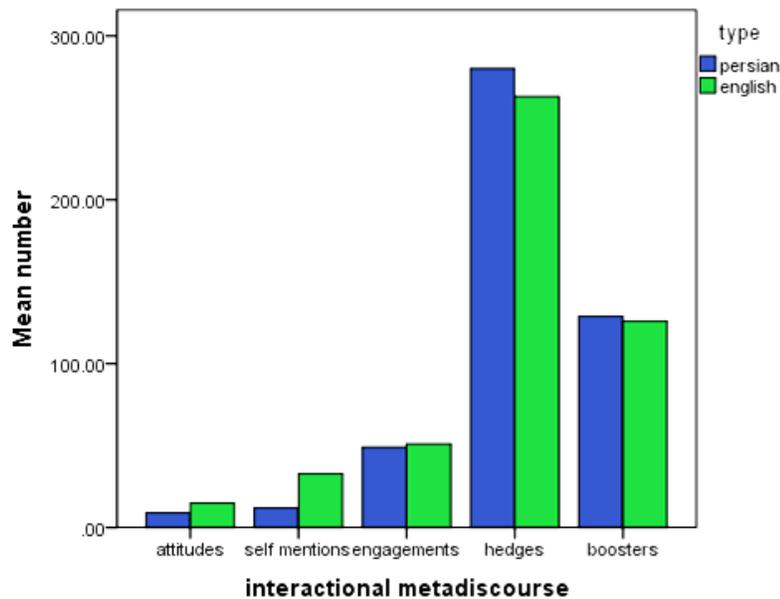
Attitude marker is another interactional metadiscourse element which often assists the writers to make interpersonal communication with their audience. As illustrated in table 2, in both groups attitude marking is the least frequent markers, this might be due to the fact that the exact nature of the hard science permits the authors to interpret their own results based on normal criteria

universal in their own disciplines and as Hyland (2010) proposed, the authors in hard sciences are often capable to draw on empirical and trusted quantitative approaches to establish a connection with their own readers rather than stating explicit personal explanations. However, as mentioned above English native writers employed attitude markers slightly more than Persian native writers, but based on chi square result ($\chi^2=2.66, p>.05$) there is no significant difference in the use of attitude markers between these two groups.

Possibly, boosters and hedges are the most frequent interactional metadiscourse markers that the academic authors enjoy in making the interpersonal communication with their own readers since “the expression of doubt and certainty are central to the rhetorical and interactive character of academic writing” (Hyland, 1998, p. 1). Also, in this study boosters and hedges were the most prevalent interactional devices and both groups make use of them effectively. As shown in table 2, Persian corpus applied hedges more than English corpus; however, there is no significant difference between two groups. The use of boosters in two corpora was approximately the same.

Engagement is yet another interactional marker which is perhaps the clearest signal of an author’s dialogic awareness (Hyland, 2001). Using second person pronouns, imperatives, and evaluating commentary, authors engage their readers as the actual players in the discourse rather than solely as implied observers of the argument. The Persian group (52.5%) used this feature more than the English group (47.5%) in their English RAs in the field of mining engineering (Figure 2). As Hyland (2010) mentioned, authors in different fields see their readers in quite different ways; therefore, we could claim that the English writers in the field of mining engineering as a hard science might have regarded the members of their discourse community knowledgeable enough to further provide them with evaluating explanation.

Figure 2. Instructional metadiscourse in Persian and English in the two corpora



Totally, interactive metadiscourse was applied more than interactional metadiscourse by these two groups (3667vs. 979). In these two groups, transitions were the most frequent marker. This is in line with Rahimpour and Faghih (2009)'s finding. Whereas the less frequent markers in the interactional category was attitude marker. In the words of Hyland (1998), usually in the hard sciences, the authorization of the individual is peripheral to the authorization of the text. He also elaborates that the authors in the hard sciences often want to disguise their rhetorical identities and they "produce accurate depictions of the real world, and their textual representation are best designed to be faceless and agentless, claiming an appearance of objectivity and neutrality" (P. 16).

5. Conclusion

This paper examined interactive and interactional metadiscourse features in English mining engineering articles written by Iranian and native English authors. The results showed that both corpora employ interactive as well as interactional metadiscourse categories. However, English authors outperformed Persian authors in interactional category numerically (1910 versus 1757), conversely, Persian group applied interactive metadiscourse more than the English group (512 versus 467), but the differences were not significant. Considering interactive metadiscourse category, the quantitative analysis of the data showed significant statistical differences in the case of evidential and code gloss markers between the two corpora (see Table 3&4). Regarding interactional category, there were significant differences in the case of self mentions provided that English group applied Selfmentions more than Persian group (Table 5).

Various scholars in second language pedagogy (Atkinson, 1997; Carson, 1998; Fox, 1994; Nelson, 1998; Ramanathan & Kaplan, 1996a,1996b) state that knowledge about a learner's culture can be utilized to predict certain behavior and avoid domains of sensitivity, thereby enhancing teaching effectiveness. According to siegel (1997), These seeks to Comprehend and categorize languages and cultures into extensive groups Indicate a universal perspective to theory building, which concludes that frameworks characterize all people while disregard the properties Of the particular (as cited in Staplaton, 2001). One field which was subject to considerable notice in this debate is critical thinking. Those taking a universalist perspective argue that particular groups of learners, particularly non-Western or Asians, are inadequate in critical thinking capabilities because they have been raised under social conventions where societal harmony and conformity are emphasized. (Staplaton, 2001). Atkinson (1997) claims that critical thinking is a strategy, reasonable behavior that is learned "through the pores" (p. 73). This study has also shown that in general, English mining engineers have individualized voices, (used more selfmentions) "which are closely related to critical thinking ability". (Stapelaton, 2001, p. 534). Thus, this study contributes to these lines of research and may have clear importance in enhancing students' awareness of English native speakers' approach toward organizing their writings in this field and similar areas. Though metadiscoursal evaluations are a helpful device for teachers to help students arrange their writing skills for successful writing.

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