



An Investigation of the Use of Interactional Metadiscourse Markers: A Cross-Cultural Study of British and Pakistani Engineering Research Articles

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Abstract: *This study tries to examine the use of interactional metadiscourse markers by Pakistani and British writers of Civil Engineering Research articles (RA's) from cross-cultural perspective. The current study employed the Hyland & Tse's (2004) "Interpersonal model" of metadiscourse. For this purpose, we built a corpus of civil engineering research articles contained with two sub-corpora of British and Pakistani RA's, 45 in each. A mixed method (qualitative and quantitative) research method was employed. Before analyzing the frequency of data, the extracted markers-according to Hyland's (2005) taxonomy of interactional markers-were checked and filtered carefully through manual examination of the markers into the source texts and the frequencies of occurrences were updated accordingly. The statistical analysis of the data was done using SPSS v.20. A chi-square test was computed and it was indicated that there is a significant difference between both sub-corpora ($\chi^2 (4) = 16.419$, $p < .003$) in the use of Interactional markers. Taken together, the results indicated that British writers used Interactional markers more than Pakistani writers (351.36 and 240.37 per 10000 words respectively). Pakistani civil engineering writers used boosters (10.3 %) -the only marker under sub-category of interactional markers- with slightly higher rate than British writers (9.6 %).*

Keywords: *Metadiscourse, Interactional, Cross- cultural, Corpora*

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Introduction

Academic writing is one of the primary concerns of non-native and native English students in the world to fulfil their academic achievement at tertiary level. Therefore, they work hard and this struggle leads them to develop communicative competence in the process of research. Consequently, they become able to produce a work of great quality on the level of theses and articles (Lee & Casal, 2014; Roberts & Cimasko, 2008). Research scholars mostly pay attention to the procedures of original research and to propositional content, without considering the reader's requirement (Tse & Hyland, 2009; Tardy, 2006). Generally, they are mainly concerned with the needs of research papers, for example: thinking about a unique topic, research problem and research questions, research methodology, data collection and data analysis test and they focus mostly on conveying new information in their research without knowing the readers level of knowledge and needs about the topic.

Academic writing is regarded an act of identity because it strengthens the writer to convey not only the ideas about the message but it also allows the writers to represent themselves (Hyland, 2011). The writers use various interesting and impressive vocabulary so that they could get readers' attention and can involve them in the discourse. Finally, the writers present the findings and arguments in writing. Therefore, it is necessary to present ideas that grab the reader's attention by credible and persuasive elements in writing. This is further confirmed by Hyland (2001), that the academic writers should use "familiar ways of expressing their arguments, representing themselves, and engaging their audiences" (p. 549). But these ways of using academic writing properly are still unknown to many teachers/writers who belong to the discipline of linguistics and translation (Ebadi, Salman, & Ebrahimi, 2015).

This may be argued that discourse in any form whether written or spoken, needs clarity and consistency in ideas because these two elements help the readers and the listeners in understanding the aimed function of the discourse. Therefore, metadiscourse is an essential aspect in our discourse. It refers to all those features of the text that are used for guiding and explaining the text to the readers and the listeners.

Metadiscourse research studies particularly focusing academic writing, have got much attention by various scholars such as school textbooks (Crismore, 1989; Hyland, 2004), undergraduate textbooks (Hyland, 2000), theses (Bunton, 1999; Burneikaite, 2008; Hyland, 2004; Swales, 1990), and

student essays (Kobayashi, 2016). Similarly, research article, is one of the most important source of academic communication has also been investigated by many researchers focusing various parts of it, for example, abstract (Rashidi & Alihossenini, 2012), introduction (Kawase, 2015; Sorahi & Shabani, 2016; Estaji & Vafaeimehr, 2015; Salar & Ghonsooly, 2015; Abdi & Behnam, 2014;), Literature Review (Bruce, 2014), discussion (Alshahrani, 2015; Ebadi.et al., 2015;) and conclusion (Alshahrani, 2015; Rezaei Zadeh, Roya & Simin, 2015; Ebadi.et al., 2015; Estaji & Vafaeimehr, 2015).

The outcomes of these research studies indicate that the use of metadiscourse in academic writing is highly affected by writers and researchers. Their use of Language varies across cultures, contexts and disciplines, which plays great role in the use of metadiscourse (Wei, Li & Gong, 2016).

Cross-cultural studies began 50 years ago, with the study of Kaplan (1966). His study focused cultural and linguistic differences in the writing of students of English as a second language. He thinks that each language and culture has its unique rhetorical patterns and that differences actually may cause the problems for non-native writers. According to Connor & Traversa, (2014) initially these types of the studies were called as *Contrastive rhetoric* and presently they are referred to as *Intercultural rhetoric* (Connor, 2004). The importance of these studies is to examine “influence of first language, culture and education on the production of the texts with the aim of advancing cross-cultural communication research as well as informing writers, editors, translators, language and composition teachers and learners, among other users and producers of text” (Connor & Traversa, 2014, p.1).

Similarly, some of the metadiscourse studies based on cultural variation and comparison have discovered important differences from cross-linguistic (Alshahrani, 2015; Kuhi & Mojood, 2014) and cross-cultural (Tavanpour, Goudarzi & Farnia, 2016; Ozdemir & Longo, 2014; Khajavy, Asadpour & Yousefi, 2012;) perspectives. Consequently, metadiscourse markers have also been investigated in several languages, like Persian (Jalilifar, 2011), Spanish (Milne, 2008) and Arabic (Sultan, 2011). Very few metadiscourse studies have been conducted in Pakistan. Among them, (Abbas, Mahmood & Yasmeen, 2016) on newspapers reportage and (Asghar, 2015) on classroom writing tasks. Therefore, a huge literature gap for metadiscourse studies can be observed. According to the available literature of

metadiscourse studies, there is not any single study conducted on research articles, specially produced by writers belonging to engineering disciplines in Pakistan. Therefore, the aim of this study is to compare and contrast the use of interactional metadiscourse markers in academic English of Civil Engineering research articles written by Pakistani and British writers.

Research Questions

To achieve the aim of this study the following research questions have been developed:

- How far are interactional metadiscourse markers used in Pakistani Civil Engineering research articles?
- How far are interactional metadiscourse markers used in British Civil Engineering research articles?
- Is there any significant difference between Pakistani and British civil engineering RA's use of interactional metadiscourse markers?

Hypotheses

- H₀ There is no difference between Pakistani Civil Engineering RA's and British Civil Engineering RA's in terms of the use of interactional Metadiscourse markers.
- H₁ There is difference between Pakistani Civil Engineering RA and British Civil Engineering RA in terms of the use of interactional Metadiscourse markers.

Literature Review

The term metadiscourse was coined by Zellig Harris in 1959 (as cited by Hyland, 2005) and his motive was to understand the use of language, in other words, how writers and speakers struggle to guide their readers and listeners. However, this was the initial step which was initiated by Harris (1959) and then various researchers developed the concept of metadiscourse and suggested different definitions and taxonomies. In the period of 1960s and 1970s the concept of Metadiscourse did not get much attention of the researchers (Sultan, 2011). Later on, the concept was expanded by various scholars and got introduced in the field of Applied Linguistics in 1980's through the works of following researchers: Williams (1981), Vande Kopple (1985), and Crismore (1989).

Definitions of Metadiscourse

Here, we will try to illustrate the concept of metadiscourse from the basic definitions to the most comprehensive. There are also some other terms for metadiscourse used by researchers, for example, non-topical material (Lautamatti, 1978), metatext (Enkvist, 1978), gambits (Keller, 1979) and metatalk (Schiffrin, 1980). There are different definitions of the term such as, "writing about writing" (Williams, 1981, p.40); "communication about communication" (Vande Kopple, 1985, p.83). According to Williams (1981) writing is based on two levels. The first level provides information about the subject matter or in other words a propositional content, whereas the second level is metadiscourse, which does not add information about subject matter, but helps readers to understand the material. Furthermore, Vande Kopple (2002) defines the functions of metadiscourse features as components, which help the readers to "...connect, organize, interpret, evaluate and develop attitudes towards that material". Similarly, Crismore, Markkanen & Steffensen (1993, p.40) provides the definition of metadiscourse as "Linguistic material in texts, written or spoken, which does not add anything to the propositional content but that is intended to help the listener or reader to organize, interpret and evaluate the information given." According to Hyland (2005, p.37) "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".

Two dimensions to Metadiscourse

There are two dimensions/views about metadiscourse (Hyland, 2005; Adel, 2006; Adel & Mauranen, 2010; Flowerdew, 2015). Some researchers (Adel, 2006; Mauranen, 1993) referred to metadiscourse features as words that help in organizing the textual information, while others opine so broadly about it and they see it as general ways employed by “speakers and writers engaging themselves into their discourse to signal their understandings of their material and their audience” (Hyland, 2005, p.ix). The first point of view is called “reflexive” model (Adel, 2006; Mauranen, 1993) and through this model researchers investigate metadiscourse features that help writers in defining purposes, directions and various internal structures. The second point of view is called “integrative or interactive” model which consider metadiscourse features as a set of interpersonal options (Hyland, 2004; 2005).

Metadiscourse models

Based on the meanings produced by metadiscourse markers (words and features), there are various ways of categorizing these features. The earliest model of the metadiscourse was proposed by Williams (1981) in his book “Style towards Clarity and Grace”. The model was based into three common and earliest types of metadiscourse. It includes Hedges and Emphatics, Sequencers and Topicalisers, Narrators and Attributions.

The next and most influential model of metadiscourse was proposed by Vande Kopple (1985) in his prominent study *Some Exploratory discourse about Metadiscourse*. In this model, metadiscourse features were divided in to two categories, which are textual and interpersonal. He identified metadiscourse markers of seven types according to their different functions. It includes text connectives, code glosses, illocution markers, narrators, validity markers, attitude markers, and commentary. (For details see Hyland, 2005). The importance of his taxonomy (categorization of the features) is that, most of the other metadiscourse taxonomies are closely based on it (Hyland, 2005; Lee, 2009;). It was also used by the researchers. Such as (Crismore & Farnsworth, 1989, 1990; Intaraprawat & Steffensen, 1995; Cheng & Steffensen, 1996).

Table 1. Vande Kopple's classification system for metadiscourse (Hyland, 2005, p.32)

Textual metadiscourse	
Markers	Functions with examples
Text connectives	Used to help show how parts of a text are connected to one another. Sequencers: (first, next, in the second place), Reminders: (As I mentioned in chapter 2), Topicalizers: which focus attention on the topic of a text segment (with regard to, in connection with)
Code glosses	Used to help readers to grasp the writer's intended meaning. Based on the writer's assessment of the reader's knowledge, these devices reword, explain, define or clarify the sense of a usage, sometimes putting the reformulation in parentheses or marking it as an example, etc.
Validity markers	Used to express the writer's commitment to the probability or truth of a statement. These include hedges (perhaps, might, may), emphatics (clearly, undoubtedly), and attributors which enhance a position by claiming the support of a credible other (according to Einstein).
Narrators	Used to inform readers of the source of the information presented - who said or wrote something (according to Lee, the President announced that).
Interpersonal metadiscourse	
Markers	Functions with examples
Illocution Markers	Used to make explicit the discourse act the writer is performing at certain points (to conclude, I hypothesize, to sum up, we predict!
Attitude Markers	Used to express the writer's attitudes to the prepositional material he or she presents (unfortunately, interestingly, I wish that, how awful that).
Commentaries	used to address readers directly, drawing them into an implicit dialogue by commenting on the reader's probable mood or possible reaction to the text (you will certainly agree that, you might want to read the third chapter first).

The next revised model was proposed by Crismore et al. (1993) in this model the researchers extended the existing model of Vande Kopple (1985) further subcategorizing the metadiscourse features by separating, renaming and collapsing them. Vande Kopple's (1985) model contained one level classification of the markers which come under the major categories of textual and interpersonal. Whereas, in the revised model by Crismore et al. (1993) an additional sub-category of interpretive markers was added under the major category of text markers. In the category of textual metadiscourse, subcategories like narrators and text connectives were dropped. Instead, they kept different subcategories in the group of the text markers, which include sequencers (*first, next, finally*), reminders (*as we discussed in chapter 5*), logical connectives (*therefore, in addition*) and topicalizers (now I will discuss). However, an additional sub-category of interpretive markers, comprised of code glosses (*for example; that is*), illocution markers (*to conclude; in sum*) and announcements (*In the next chapter, in the following paragraphs*) was included under text markers. On the other side, changes were also made in the interpersonal metadiscourse category. Validity markers were divided in to three separate subcategories of hedges (from my perspective, maybe, often), certainty markers (shows, certainly) and attributors (Smith claims that,). Attitude markers (surprisingly) and commentary markers (you may not agree that) remained same as in the earlier model. However, the attributors were added as an additional feature under the category of interpersonal markers, which were previously placed as narrators under the major category of text markers in Vande Kopple's (1985) model.

Hyland & Tse's (2004) Interpersonal Model of Metadiscourse

The most cited and researched model is of Hyland & Tse's (2004) in the present time. It is called interpersonal model by Hyland (2005). In this model, the names of the major categories of metadiscourse markers with distinction (interactive and interactional) have been employed from Thompson & Thetela's (1995).

Interactive markers

Interactive markers refer to ways of organizing information. This belongs to the writer's knowledge of the audience and the main purpose of this category is to organize and shape the information according to the needs of readers. This further helps the readers in understanding the writer's given or suggested interpretations of the material/ text.

Interactional markers

Interactional markers, the second category of metadiscourse markers refers to the ways of the writers making interaction in their text by commenting on the text. The main purpose of writers by using this category of the markers is to make explicit their views and at the same time involve their readers in the text.

Table 2. Interpersonal model of metadiscourse (Hyland, 2005)

Interactive: Help to guide the reader through the text		
Category	Function	Examples
Transitions	express relations between main clauses	in addition; but; thus; and
Frame markers	refer to discourse acts, sequences or stages	finally; to conclude; my purpose is
Endophoric markers	refer to information in other parts of the text	noted above; see fig; in section 2
Evidentials	refer to information from other texts	according to X; Z states
Code glosses	elaborate propositional meanings	namely; e.g; such as; in other words
Interactional: Involve the reader in the text		
Hedges	withhold commitment and open dialogue	might; perhaps; possible; about
Boosters	emphasize certainty and close dialogue	in fact; definitely; it is clear that
Attitude markers	expresses writer's attitude to proposition	unfortunately; I agree; surprisingly
Self-mentions	explicit reference to author (s)	I; we; my; me; our
Engagement markers	explicitly build relationship with reader	consider; note; you can see that

Previous Research Studies

Pooresfahani, Khajavy & Vahidnia (2012) investigated features of metadiscourse markers (Interactive and Interactional) in Iranian papers across the fields of applied linguistics and Engineering. The corpus they used was consisted of eight research articles from both disciplines and Hyland's (2005) model of interpersonal model of metadiscourse. Results of the study revealed that both disciplines used both types of markers and it was also proved that papers from both disciplines used interactive markers more than the interactional markers. The results also proved that Iranian researchers focused more on those markers that help them in organizing the discourse according to the needs and expectations of their readers. However, the use of interactional markers was significantly low in both disciplines and it could not help them more in engaging their audience in text.

Similarly, Ozdemir & Longo (2014), conducted research on metadiscourse use in theses (Abstract). Their study was cross-cultural with the aim of exploring cultural variations between Turkish and USA postgraduate students. Their corpora are built upon 52 theses and they selected only (Abstracts) from it and the language of thesis was English. The model they followed was Hyland's (2005). All the theses were collected from the department of English Language Teaching. They employed mixed methodology in their research for the purpose of analyzing the text in the corpora. The results show that Turkish students used fewer of these markers, including, evidentials, endophorics, code glosses, self-mentions, boosters and attitude markers. Moreover, Turkish students used more of the following markers than USA students. It includes hedges, frame markers and transitions.

Khedri, Ebrahimi & Heng (2013) the authors studied interactional metadiscourse markers in four disciplines. Corpus of the study was built on research articles and they focused on results and discussion sections from them. The names of the disciplines were: Economics, English Language Teaching and Biology. They selected four research articles from each discipline. The papers were selected from Malaysian research journals, published during years 2009 and 2010. The data analyzed through Monoconc pro2.2 (a text concordance program), the software was used to search frequency of the occurrences and then counted manually the frequencies of metadiscourse. The results showed that there were differences but not statistically significant differences. However, there is a

difference in the use of boosters between disciplines. Another, recent cross-cultural study conducted by Tavanpour .et al., (2016), examined the data of sport newspapers and they selected interactional markers category for their research. The newspapers were written by American and Iranian authors. Their study was based on Hyland's (2005) taxonomy. The results indicated the use and differences of metadiscourse markers in the study. The findings revealed that the major difference was in the use of attitude and boosters markers between two corpora. However, hedges were employed more often by Iranian writers than the Americans. Statistical analysis shows significant difference in the use of Hedges between two datasets.

Similary, Farzannia & Farnia (2016) conducted research on Mining Engineering research articles written in English and Persian using Hyland's (2005) taxonomy. The total number of research articles were 68, taken from engineering discipline. The findings indicated that the English writers used more interactional markers than the Persian writers.

Methodology

This is a corpus based research study. The researchers focused on investigation of the use of interactional metadiscourse markers across Pakistani and British civil Engineering research articles. Due to unavailability of a pre-built and suitable corpus, representing Pakistani and British engineering writers, a corpus of 90 articles was built with two sub-corpora of 45 research articles representing civil engineering research writings of both the countries.

Selection of research articles from a huge number of research articles available through open access research journals, databases and universities' research repository helped us improving the reliability. The selection process was done carefully focusing the standards, quality research articles and authors' cultural identity representing Pakistani and British civil engineering writers, which met the criteria of representativeness according the standard process of corpus building (Sinclair, 2004). The corpus for this study comprises of two sub-corpora, which represent civil engineering writings in research articles of two distinct cultures of Pakistan and Britain.

The first sub-corpus, representing Pakistani civil engineering writing was built by adding research articles written by Pakistani civil engineers and only published in Pakistani engineering research journals recognized by Higher Education commission (HEC) Pakistan. According to the quality and research standards all Pakistan research journals are classified into X,

Y and Z. The research journals under X category are considered of high quality as compared to Y and Z. Therefore, only the research articles published in journals under X category were included in the sub-corpus of Pakistani civil engineering research articles.

Unlike Pakistani research journals, British research journals and articles were not classified into categories. Therefore, the inclusion of British civil engineering research articles was based on the publications by highly ranked British universities' native faculty members of civil engineering. The research articles, representing British civil engineering writing were selected from the research repositories of Imperial college London, University of Leeds, University College London, New Castle University, University of Edinburgh, University of Manchester, University of Cambridge, University of Bristol and University of East Anglia.

The identification of British native researchers was also a difficult process. It was not possible to recognize the nationalities of the researchers just by their names. Therefore, we tried our best to recognize them with the following criteria. The list of faculty members (civil engineering) from each university and college of engineering was extracted. Next, their personal profiles, websites and resumes were explored and checked carefully. In this process of identification, we focused their nationality, education and job history. Those faculty members who lived, were educated and worked in UK were selected and the rest of others were excluded.

The last and most important factor, the period of publication of research articles was also considered which was the common strategy for the selection of research articles for both the sub-corpora. Only the research articles published between the period of 2010 and 2016 were included.

Table 3. Description of corpus

Countries	Research articles (data)	Total No of words
British	45	291673
Pakistani	45	145234
Total No:	90	436907

Procedure and Extracting Interactional markers from corpora

At this stage, first we downloaded all the research articles according to the requirement of the study, next we converted all the PDF files in to Microsoft Word format and then to notepad. This procedure helped us in deleting author's information, references list from the files and Appendix pages from the research articles. Next, we searched the Interactional markers one by one through Antconc 3.4.4w 2014, the description of the searching of frequencies is presented in Table No. 4. Antconc is a concordance freeware software that helps in finding the frequencies of Interactional markers from our sub-corpora.

Identification of Interactional markers

In the process of finding frequencies of each marker of Interactional category, we also confirmed manually the results of the occurrences of Interactional marker functioning as metadiscourse. This step was carried out because Metadiscourse and non-propositional material is also presented together and it can be identified only through realization of its context. According to Hyland (2005), in the analysis of metadiscourse features, we must recognize metadiscourse features manually. This helps the researchers in presenting the actual frequency of metadiscourse markers.

Data Analysis

The corpus was analyzed on Hyland's (2005) interpersonal model of Interactional metadiscourse markers. Metadiscourse markers are considered as signposting and are employed by writers in order to direct the receivers of the text (readers) towards the goals of the text production.

The first step was taken of understanding and classifying metadiscourse markers, a quantitative analysis was carried out to examine the differences between Pakistani and British corpora. Quantitative analysis was important for corpus based study, for finding the frequencies of metadiscourse markers in both corpora. Finally, chi-square test which is a statistical analysis, was carried out through SPSS 2.0, and the purpose of this test was to examine the similarities and differences between two corpora. This test helps the researchers to examine the frequency of data. Moreover, it helps in comparing the frequency of the data (Hinton, McMurray and Brownlow, 2014).

Results and findings

In this section we will provide, the results of Interactional metadiscourse markers use in civil Engineering research articles by Pakistani and British writers. The description of the results is divided in to two sub-sections. The first sub section will illustrate the results of Interactional metadiscourse markers use in terms of frequency of occurrences within the texts of RAs, representing the relevant cultural category (Pakistani and British writers). This will also provide the answers to research questions 1 and 2. In the second, the results of inferential statistical test of Pearson chi-square will be presented to test the null and alternative hypothesis of the research question 3.

Pakistani and British writers' use of Interactional markers

Table 4. Frequency and Percentage analysis per 10000 words

Interactional Markers	Pakistani No of Markers			British No of markers		
	F	f/10,000	Percentage	f/10,000	F	Percentage
Attitude Markers	220	15.15	6.30	18.79	548	5.35
Boosters	892	61.42	25.55	56.57	1650	16.10
Self-Mention	49	3.37	1.40	24.38	711	6.94
Engagements	1272	87.58	36.44	140.09	4086	39.87
Hedges	1058	72.85	30.31	111.53	3253	31.74
Total Σ	3491	240.37	100%	351.36	10248	100%

The descriptive analysis of the data sets revealed that both data sets have employed all Interactional markers of the interactional category. Table no: 4 shows the percentage of the markers use. In Pakistani corpus, engagement (36.44%) was used more than the other markers of the interactional category. Further the results indicated the use of other markers, which are mentioned here according to their percentage order, Hedges (30.31%), Boosters (25.55%), attitude markers (6.30%) and self-mentions (1.40%) respectively.

Whereas the percentage of the British corpus is discussed here; engagement markers (39.87%) percentage was found highest in the frequency analysis,

However, Hedges were (31.74%), followed by boosters (16.10%), self-mentions (6.94 %), and attitude markers (5.35%) only.

In the paragraph above, the results for Pakistani and British writers' use of interactional metadiscourse markers were separately discussed.

Table no: 4 also presenting the whole descriptive analysis about both sub-corpora in terms of frequencies and percentages. From this result, it is pointed out that Pakistan writers have used less interactional markers than British writers. However, it is worth mentioning the sub-corpora size of Pakistani writers is 145234 less than the size of British sub-corpora which is 291673. We normalized the data per 10000 words frequency. The statistical analysis shows that, Pakistani writers used 3491 interactional markers whereas British writers used 10248 interactional markers.

There is a strong similarity in the use of Engagement markers between two corpora. Engagement markers refer to explicitly build relationship with the reader, for example: consider; note; you can see that. (Pakistani 36.44%, British 39.87%) Engagement markers were used in highest numbers in both the sub-corpora. Hedges refers to (withhold writer's full commitment to proposition. For example: about, perhaps, might) Hedges were used little bit more by British writers as compared to Pakistani writers (British 31.74%, Pakistani 30.31%). Pakistani writers use more Boosters as compare to British writers (Pakistani 25.55%, British 16.10), Boosters refer to the devices that are used by the writers to express certainty, for example: (it is clear that, in fact).

Pakistani writers use of attitude markers (that are used to express writer's view towards proposition) is also more than the British writers (Pakistani 6.30, British 5.35). However, the use of self-mentions in Pakistani and British corpora is found very low in accordance with computed percentage figures (Pakistani 1.40% and British 6.94%).

Some examples of Interactional markers in Pakistani corpus

Self-Mentions: **We**, however, also observe that the same optimum slab thickness results in an optimum value of additional moment capacity for girders as well. Pk-EngrRA-CE014

Attitude markers: The results demonstrate that the compressed earth bricks incorporating jute fibers **dramatically** increased the strength and can prove to be more sustainable than conventional mud homes. Pk-EngrRA-CE015

Boosters: The study **found** that moderate to high deficiencies exist between design specifications and construction practices for the construction of RC buildings in Pakistan. Pk-EngrRA-CE012

Engagements: Finally **consider** the results with no glacier condition. Pk-EngrRA-CE031

Hedges: As a part of this, it is important to analyze the strategy through which the conflict is faced by the project team, which otherwise **may** affect the project. Pk-EngrRA-CE006

Some examples of Interactional markers in British corpus

Self-mentions: **We** present a model that quantifies current water use of the UK electricity sector and use it to test six decarbonisation pathways to 2050. Br-EngrRA-CE005

Attitude markers: **Unfortunately**, the data collection methods used in this study are time consuming making a large study (i.e. $n = 50+$) difficult. Br-EngrRA-CE016

Boosters: The results **clearly** show that progressively ambitious transport pathways (in terms of technological change and modal switching), can achieve proportionally higher levels of useful work delivery and deep reductions in energy consumption and emissions. Br-EngrRA-CE003

Engagement markers: If **we** now imagine their widths becoming infinitesimally thin, the deformed shape is entirely faceted; the e-cone motif can be formed instead by discretely folding along certain lines in a slit disk. Br-EngrRA-CE024

Hedges: These are **generally** restricted in their applicability to congested traffic situations due to inherent weaknesses in replicating, in the modelling process, traffic's non-linear behavior. Br-EngrRA-CE017

Inferential Statistics

We analyzed the use of interactional metadiscourse markers in civil engineering RA's texts (Attitude markers, boosters, self-mention, hedges and engagement markers) by authors from two distinct cultures (Pakistani and British). To determine the association between cultural aspects and use of interactional markers, a statistical analysis of Chi-square test of independence was calculated comparing the frequency of interactional markers' use in Pakistani and British civil engineering RA's.

Table 5. Chi-Square Test

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	16.419 ^a	4	.003
Likelihood Ratio	18.131	4	.001
Linear-by-Linear Association	2.556	1	.110
N of Valid Cases	592		

($\chi^2(4) = 16.419, p < .003$)

A significant interaction was found ($\chi^2(4) = 16.419, p < .003$). British civil engineering writers were more likely to use interactional metadiscourse marker (59.5 %) than Pakistani civil engineering writers (40.5 %).

Cultural differences in academic writing are pointed out here through this result sheet table no: 6.

Table 6. Interactional Markers * Countries Cross tabulation

			Countries		Total
			British	Pakistani	
Interactional Markers	Attitude Markers	Count	19	15	34
		Expected Count	20.2	13.8	34.0
		% within Interactional Markers	55.9%	44.1%	100.0%
		% within Countries	5.4%	6.2%	5.7%
		% of Total	3.2%	2.5%	5.7%
	Boosters	Count	57	61	118
		Expected Count	70.2	47.8	118.0
		% within Interactional Markers	48.3%	51.7%	100.0%
		% within Countries	16.2%	25.4%	19.9%
		% of Total	9.6%	10.3%	19.9%
	Self Mention	Count	24	3	27
		Expected Count	16.1	10.9	27.0
		% within Interactional Markers	88.9%	11.1%	100.0%
		% within Countries	6.8%	1.2%	4.6%
		% of Total	4.1%	0.5%	4.6%
	Engagement	Count	140	88	228
		Expected Count	135.6	92.4	228.0
		% within Interactional Markers	61.4%	38.6%	100.0%
		% within Countries	39.8%	36.7%	38.5%
		% of Total	23.6%	14.9%	38.5%
	Hedges	Count	112	73	185
		Expected Count	110.0	75.0	185.0
		% within Interactional Markers	60.5%	39.5%	100.0%
		% within Countries	31.8%	30.4%	31.2%
		% of Total	18.9%	12.3%	31.2%
Total	Count		352	240	592
	Expected Count		352.0	240.0	592.0
	% within Interactional Markers		59.5%	40.5%	100.0%
	% within Countries		100.0%	100.0%	100.0%
	% of Total		59.5%	40.5%	100.0%

The total interactional markers used by British writers are 59.5% which is actually higher use of markers than Pakistani writers, their use of markers is 40.5%. However, Pakistani writers used boosters more than British writers (Pakistani 10.3% and British 9.6%). This is the only subcategory which is used by Pakistani writers more. British writers used more these subcategories respectively, Attitude markers (3.2%), self-mentions (4.1%), Engagement markers (23.6%) and Hedges (18.9%). Moreover, Pakistani writers use of markers is low, Attitude markers (2.5%), self-mentions (0.5%), Engagement markers (14.9%) and Hedges (12.3%).

Discussion

After the analysis of the data, we discovered cultural similarities and differences in research articles written by Pakistani and British scientific researchers. Frequency of Interactional metadiscourse was normalized per 10000 words. The results of Interactional markers frequency indicate that British writers use of Interactional markers is higher than Pakistani writers, 351.35 and 240.37 respectively. There are some important differences as presented in result section (see Table no: 6). It is important to note that the frequency of interactional markers in Pakistani sub corpora is following: Self-mentions found (3.37) only, which is the lowest frequency as compare to British writers. However, Engagement markers were employed most frequently (87.58), Hedges (72.85), Boosters (61.42) and attitude markers were found (15.15). However, frequency of British writer's sub corpora is following: Engagement markers were used most frequently and found (140.09), Hedges (111.53), Boosters (56.57), Attitude markers (18.79) and the least frequent marker is self-mentions (24.38).

We found significant differences in this cross-culture research. The possible reasons of the less use of Interactional markers of Pakistani writers is due to the quality of academic writing education and the use of English as a second language in Pakistan. However, the second reason is that Pakistani writers of Civil Engineering RA's, as non-native speakers of English, might have influence of their L1 on their writing practices, which might include the writing strategies and art of persuasion reflecting writing in L2 (English). This transfer of skills of writing influenced by L1 affects interaction between the writer and their receiver of text (readers). However, Pakistani writers can take some steps to reduce this negative influence in their writing, such as paying careful attention at the remarks of the reviewers, submitting their research before publishing to the proofreading centers and considering their readers requirements of text. Furthermore,

curriculum developers in Pakistan can also include features of writing like, metadiscourse features for learning and improving academic writing. Textbook producers may also include metadiscourse features and highlight them in exercises of the English language books in Pakistan. Teachers of English language in Pakistan should also notice the intercultural differences in writing. They can focus on metadiscourse elements of Interactional and Interactive markers in their teaching and arrange reading activities and point out the interaction in it. English language teachers at tertiary level can also arrange workshops and seminars that help researchers, learners for improving academic writing and the concept of interaction. It might be the reason that metadiscourse features are neglected because of the unawareness, traditional grammar teaching and focusing the syllabus particularly in Pakistan. This will possibly help new generations of academic communities for developing interaction in their writing.

Conclusion

Interactional metadiscourse features help the writers to make interaction with their readers, engage them in the discourse, present certainty and uncertainty and viewpoints about the propositional information given in the text. To achieve these objectives, researchers/ academic writers/ writers get involved in the text with the purpose of creating attraction in the text by employing interactional markers. As Hyland (2005) comments, Interactional metadiscourse markers are playing great role in presenting new information and making academic claims. In this study, we found significant differences in the use of Interactional markers between two sub corpora. We have examined Interactional markers in research articles written by Pakistani and British writers. The result indicates that British writers used more markers than Pakistani writers, the percentage is followed (59.5%, 40.5%) respectively. Use of Boosters result shows the slightly difference, Pakistani used 10.3% whereas British used 9.6%. Use of self-mentions is used very little by Pakistani writers, which is (0.5%) as compare to British writers who used (4.1%). This clearly shows that; Pakistani writers have to include such features that conduct interaction between their text and readers. There are some limitations of this study. The corpus of this study is comprised of 90 research articles only of Civil Engineering discipline. We built two sub corpora of 45 research articles, one for Pakistani writers and one for British writers. We investigated 90 research articles cross-culturally; future researchers can include more research articles and more sub disciplines of Engineering for examining the use of metadiscourse at cross-cultural and cross-discipline level. Moreover,

Interactional dimension of metadiscourse is investigated in this research study, however Interactive dimension is not investigated by us. Future researchers may also include Interactive dimension for cross-cultural studies. This will help to improve the use of metadiscourse in ESL and EFL countries. This may put more insight into the studies of metadiscourse use by writers from ESL and EFL countries.

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