

Genre-Based Analysis of English and Persian Research Article Abstracts in Mining Engineering Journals

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Abstract

The current research aimed to explore the rhetorical moves in abstracts of English and Persian Mining Engineering research articles. For this purpose, 60 abstracts written by native speakers of English and Persian were analyzed based on Hyland's (2000) model of five rhetorical moves to explore the pattern of moves in abstract sections. Findings suggested that there were four conventional moves in abstracts in the English corpus (PMPrC), while there were five conventional moves in abstracts in the Persian corpus (IPMPrC). Results of statistical analyses show that there was a statistically significant difference in Purpose move in the two dataset. However, there were not any significance differences in the use of other moves such as product, method, and conclusion moves in the corpora.

Keyword: *Abstract, Genre, Move pattern, Mining Engineering*

Introduction

The work of genre is to intercede between social contexts and the texts that react strategically to the exigencies of those contexts (Swales, 2009). As Frow (2006) indicates, when texts are well conceived and well formulated, they perform the genre. When these performances propagate, genres incline to go through time and geographical space, partially inherently and partially due to intertextual acceptances and rejections. Genre analysts' work is to find and record these textual regularities and irregularities and describe them with regard to the pertinent and relevant social circumstances and the rhetorical demands they bring about. Therefore, they can become more clear to those who would need or desire to become better producers or consumers of

textual patterns in the targeted genre or genres (Swales, 2009).

In this regard, Hyland (2013) indicated that genre analysis has been proved as one of the most popular and productive frameworks for the evaluation of specialized communication in scholarly, institutional, and professional settings. The genre has also been explained as the evaluation of established linguistic behavior in institutionalized scholarly or professional context (Bhatia, 1997). The rationale beyond such acceptance among applied linguists is perhaps due to its considerable pedagogic suggestions for the practitioners in the communicative ESP and EAP classroom (Brett, 1994). Acquainting students or neophyte researchers with suitable

disciplinary norms like the appropriate linguistic points of communicative functions are an illustration of such suggestions.

Much research has been carried out on how to write different sections of research articles (hence, RAs) from the perspective of generic structure. Several cross-cultural and cross-linguistic studies on different sections of research articles written by Iranian writers in English and Persian including abstract sections (e.g., Abarghoinezhad and Simin, 2015; Behnam and Zamanian, 2013; Ghasempoor and Farnia, forthcoming; Hasrati and Gheituri, 2010; Marefat and Mohammadzadeh, 2013; Talebzadeh, Ghafar Samar, Kiany and Akbari, 2013), introduction sections (e.g., Khani and Tazik, 2010; Omidi and Farnia, 2016; Rahimi and Farnia, forthcoming),

method sections (e.g., Asam and Farnia, 2017), and result sections (e.g., Atai and Fallah, 2004), conclusion sections (e.g., Jahangard, Rajabi-Kondlaji and Khalaji, 2014; Vazifehdan and Amjadiparvar, 2016) and discussion sections (e.g., Attai and Fallah, 2004; Dobakhti, 2016; Ershadi and Farnia, 2015; Hashemi and Gohari Moghaddam, 2016; Khorammdel and Farnia, 2017; Salmani Nodoushan, 2012) were carried out.

Despite the substantial literature on genre studies, the abstracts sections of RA in the field of mining engineering remain unexplored. As such, we were led into investigation of how abstract sections of RA in this field are rhetorically organized in English RA articles written by native and non-native writers.

Review of Literature

According to Hyland (2005), abstracts are typically the readers' initial encounter with a text and often the stage where they decide whether to study the accompanying paper, or to dismiss it. To quote Pho (2008), "acquiring the skills of writing an abstract is therefore important for novice writers to enter the discourse community of their discipline" (p. 231). Hartley and Betts (2009, p. 2015) state that, "It is possible that more papers might be read in detail if the abstracts were more informative." What follows is an introduction to genre and genre studies and the empirical studies on the abstract sections of RAs.

Genre Definition

Swales (1990) declares that "a genre comprises a class of communicative events (p.58)." According to Swales, "A communicative event is one in which language plays both a significant and an indispensable role (p.45)." He likewise stresses that the communicative event is a complex concept, consist of not only of

the discourse itself but also of the position of the discourse and the environment and culture encompassing it. Bhatia (1993) introduces the concept of "nonfictional genre" in genre analysis field. The first explanation made by Bhatia is that the essence of a genre 'is primarily characterised by the communicative purpose(s) that it is intended to fulfil' (Bhatia, 1993, p. 13). The communicative purpose(s) will regulate the structure of the genre; if the purpose(s) change in an important way, the genre would be different. Bhatia continues his explanation with the consideration that 'communicative purpose is a fairly reliable criterion to identify and distinguish sub-genres' (Bhatia, 1993, p.14). Bhatia remarks on conventions and structure in the sense that 'specialist members of any professional or academic community are generally credited with the knowledge of not only the communicative goals of their community but also the structure of the genres in which they

regularly participate as part of their dailywork' (Bhatia, 1993.p.14). Berkenkotter and Huckin (1995) state that, "Genres are intimately linked to a discipline's methodology, and they package information in ways that conform to a discipline's norms, values, and ideology. Understanding the genres of written communication in one's field is, therefore, essential to professional success (p.1)." Based on this statement, genres could be viewed in a distinct perspective from the ones previously explained. Methodology has been stated before but the very comprehensive concepts of 'norms, values, and ideology' are new in this debate.

Genre Analysis

Interpreting the convention of the genre-text is a matter of regarding the way in which information is stated. Bhatia declares in his explanation: 'Specialist writers seem to be fairly consistent in the way they organize their overall message in a particular genre' (Bhatia, 1993, p. 29). For instance, Bhatia refers to a study accomplished by Swales which shows that article introductions (seen as a genre) generally follow a specific structure of four rhetorical 'moves'. Each move comprises a new kind of information and, therefore, satisfies a new communicative purpose. For each move there may be several distinct strategies to follow. In this way it is shown that each move has its own communicative intention performing as an element of the overall purpose of the genre-text (Bhatia, 1993). Likewise, the communicative purpose is an important aspect of any genre and, therefore, explaining a feasible particular communicative structure in the genre-text would aid the analyst in his concluding upon his results. As a comment on the above statement on specialist writers by Bhatia, it must be stressed that the more compatible

these specialist writers are, the more obviously their genre can be explained. So accordingly, it is a central issue for the analyst to try to explore some specific structure or organisation of the genre-text in question.

Swales (2004) describes Move in genre analysis as "a discursive or rhetorical unit that performs a coherent communicative function in a written or spoken discourse" (Swales, 2004, p. 29). As Swales (2004) indicated, a Move, at one end, can be recognized by a clause; at the other by various sentences. It is a functional not a formal constituent. Ding also suggested that writing genres can be explained as a functional constituent in a text, being pertinent to the whole task, which is applied to recognize the textual regularities in specific genres of writing (Ding, 2007). Based on what he said, Moves can have various lengths from one proposition to several paragraphs. Furthermore, Nwogu (1997) describes Move as "a text segment made up of a bundle of linguistic features (lexical meaning, propositional meanings, illocutionary forces, etc.) which give the segment a uniform orientation and signal the content of discourse in it" (p. 122). Each structural move can be perceived via a number of smaller rhetorical sections noted as 'steps' by Swales (1990) or 'strategies' by Bhatia (1994). According to Samraj (2005) both moves and steps are functional elements and can be compulsory or non-compulsory in a genre (as cited in Li 2011). This body of work includes Swales (1990), Bhatia (1993), Santos (1996), Hyland (2000) and many others. In his innovator study on move-analysis, Swales (1990) offered CARS model (Create a Research Space), so as to appear to be a three-move system. The CARS model had the power to effect multitudinous later

research on the pattern of the introduction in addition to abstracts (Bhatia, 1997; Samraj, 2002, 2005).

Genre Analysis is known for its different educational suggestions. Kay and Dudley-Evans (1998) stated that genre is a “very powerful pedagogic tool” because it defines the sorts of discourse the students need to be capable to construct, and likewise—considering its social setting and purpose—it can describe “why a discourse is the way it is” (p. 310). Iranian scholars as nonnative speakers of English may also have such difficulties, therefore, several studies have been carried out to illuminate the nature of the medical, applied linguistics, and engineering RAs (Abarghooeinezhad and Simin 2015, Ahmadi 2009, Marefat and Mohammadzadeh, 2013; Saboori and Hashemi, 2013; Talebinezhad and Arbabi, 2012) to help Iranian scholars to be aware of the conventions of each genre and the way native scholars write. A number of these studies are discussed in the following section.

Empirical Studies

Busch-Lauer (1995) compares the move patterns of 40 German abstracts and their English equivalents in the field of Medical Science to investigate the rhetorical moves and s/he indicated that the move ‘Background information’ predominated in the structure of the studied German non-native speaker abstracts, whereas ‘Purpose of study’ and ‘Conclusions’ were not obviously stated.

Martín (2003) in a study on a total of 160 RA abstracts in social sciences written in English and Spanish found that Spanish abstracts in experimental social sciences conform to the IMRC (Introduction, Method, Results and Conclusion) structure of the article itself, but that the frequencies

of occurrence of the Results and the Introduction moves were significantly different. Martín indicated that the abstracts written in English for international journals in the experimental social sciences more closely reflect Swales’s (1990) model as regards the use of the three moves, whereas the Spanish abstracts in the same field are less rhetorically complex.

In the context of Iran, Ahmadi (2009) evaluated 60 research article abstracts from the Biological Sciences. He indicated that moves described by Bhatia (1994) can more or less be traced in all abstracts analyzed in that study. Findings revealed that describing previous research was generally used with much less frequently by Iranians than by English-speaking writers. Also English-speaking authors were far more detailed in their accounts of their conclusion and discussion of the implications of their work.

Talebinezhad, Arbabi, Taki and Akhlaghi (2012) investigated 64 medical article abstracts (32 in international journals, 32 in Iranian journals) on the basis of Swales’ model (1990). The data demonstrated that the translated abstracts from Persian into English in research medical articles conform to the determined criteria for scientific writing while the original ones often neglect the criteria, although they were linguistically superior to the original English ones. However, they indicated that the superiority of the translated abstracts could be owing to several factors such as exposing Iranian specialists in medical sciences to instruction of essay writing; using educated translators who are knowledgeable in academic writing and in medical sciences simultaneously. In addition, they showed that there was a significant difference in method chapter.

Marefat and Mohammadzadeh (2013) analyzed 90 English and Persian abstracts written in the discipline of literature, by English and Persian native speakers, based on the IMRD and CARS models. The findings revealed that literature RA writers typically focus on Introduction and Results, ignore Method and Discussion, and do not mention the niche in previous pertinent work; secondly, although none of the models were useful, literature abstracts typically matched CARS more than IMRD (Concerning the *sequence* of moves, only 13% of the abstracts manifested the I-M-R-D sequence).

Esfandiari (2014) explored the rhetorical moves of 32 abstracts in the fields of Artificial Intelligence and Architecture (two influential subfields in Computer Sciences) based on Hyland's (2000) five rhetorical move model. The findings showed that there were four conventional moves and one optional move in abstracts in both related disciplines. The findings further corroborate the five-move model proposed by Hyland (2000). He indicated that Hyland's model is more powerful to be applied to research article abstracts in Artificial Architecture and Intelligence in so far as the subfields are concerned.

More recently, Abarghoonezhad and Simin (2015) examined 50 abstracts of English articles (25 were written by native writers of English and 25 written by Iranian non-native writers of English) in the field of

Corpus

For the purpose of this study, 60 articles were randomly selected from Mining Engineering leading journals written by English native and Iranian non-native speakers in English (30 in each corpus) published from 2013 to 2015. The randomly

Electronic Engineering. The analytical model proposed by Santos (1996) was adopted. The result revealed that abstract section Moves used by both groups do not completely correspond to the model proposed by Santos (1996). The results of chi square analyses further showed that there were no significant differences regarding the frequency of each move between two groups.

Following this line of research, the main purpose of this study was to find dissimilarities and similarities in classification and frequency of move structure of research article abstracts written by English native and nonnative (Iranian) students in the field of Mining Engineering. The results of the current study can be helpful to EAP, ESP and EFL teachers to instruct their neophyte students these schematic structures and students, in turn, can apply the discovered model in their abstract writing.

Objectives of the Study

This research aims to examine the rhetorical moves of Iranian and English Mining Engineering RAs abstracts. Thus the following objectives are formulated:

1. To investigate the move structures in the abstract sections of English and Persian Mining Engineering research articles.
2. To examine whether there is any significant difference between Persian and English Rhetorical moves that represent the generic structure of abstract sections of Mining Engineering research articles.

Method

selected journals are International Journal of Mining Science and Technology, International Journal of Damage and Mechanics, International Journal of Rock Mechanics and Geotechnical Engineering, and International Journal of Rock Mechanics and Mining Sciences.

Data Analysis

Hyland's (2000) five-move model were adopted as the framework for move analysis of the abstracts in the present study. Apposed to the IMRD model, this frame differentiates the abstract's aim from the introduction, because it has an unlike role from the introduction's usual aim of preparing a confirmation for the study. In this frame, a product move is regarded as an alternative to the result move, as Hyland (2000) interpreted this move can more thoroughly illuminate abstracts from the social science fields, which occasionally contain not only a declaration of practical results but also a declaration of the claim. This model still differs in introduction move from Bhatia model. For Hyland, RA abstracts composers apply the introduction move to rationalize their research and create the appropriate context. Santos' (1996) model was extracted from 94 abstracts in

the discipline of applied linguistics, though Hyland's (2000) model was derived from 800 abstracts covering 8 disciplines, sociology, philosophy, biology, physics, electrical engineering, marketing, mechanical engineering, and applied linguistics, therefore, Hyland's (2000) model covered both of the hard and soft sciences and was selected as the framework for data analysis in the current study. Hyland's (2000) model is illustrated in Table 1.

For the purpose of this study, the frequency of occurrence of each move was statistically calculated and tallied. Following previous studies (e. g. Kanoksilapatham, 2005), a move was regarded compulsory if its frequency was no less than 60% of the corpus in each field. On the other hand, if a move occurred less than 60% of the corpus, it was regarded non-compulsory.

Table 1
Hyland's (2000) 5-move Framework for Rhetorical Analysis of RA Abstract

Moves	Definition
Introduction(I)	Establishing context of the paper and motivates the research or Discussion
Purpose (p)	Indicates purposes, thesis or hypothesis outlines the intention behind the paper
Method (M)	Provides information on design, procedures, Assumptions, approach, data, etc.
Product (p)	States main findings or results, the argument, Or, what was accomplished
Conclusion(C)	Interprets or extends results beyond the scope of paper, draw inferences, points to applications or wider implications

Result

The frequencies of structural moves appliance by Persian and English writers in the abstracts chapters in the field of Mining Engineering are illustrated in Table 2.A

number of notable features were discovered to be shared by the abstracts of the two groups. One was that the most frequent moves for the two groups were purpose,

method, and product moves. However, introduction move was the less frequent move in English group. Considering the Persian corpora, Conclusion and introduction moves were the least frequent

with equal frequency. Thus, according to Kanoksilapatham (2005), introduction move in English group was optional and all other moves were considered obligatory because their frequency were not less than 60%.

Table 2
Frequency and percentage of moves in two corpus

Corpus Sections	English		Persian	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Introduction	15	50	18	60
Purpose	26	86.66	30	100
Method	27	90	30	100
Product	28	93.33	29	96.66
Conclusion	19	63.33	18	60

As illustrated in Table 3, the English writers have higher tendency to use moves

in more complex pattern that are not compatible with Hyland (2000) framework.

Table 3
The number and pattern of moves in each group

Number	Persian	English
1	IPMPrC(9)	IPMPrC(7)
2	IPMPr(9)	IPMPr(3)
3	PMPPrC(8)	PMPPrC(12)
4	IPM(1)	IPM(1)
5	PMPPr(3)	PMPPr(1)
6		MPr(1)
7		MPrC(1)
8		IMPrC(1)
9		IPPr(1)
10		IC(1)

Note: I: introduction, P: purpose, M: method, Pr: product, C: conclusion

The IPMPrC and PMPPrC was the most frequent pattern in the Persian and English groups respectively. Generally, abstracts in the Persian group were more compatible with Hyland's five move model than the English group. The appliance of IPMPrC pattern in the Persian group was approximately 30 percent while the English

group totally have IPMPrC pattern around 26 percent.

Chi-square Results

Results of chi-square analysis are presented in Table 4. The results of chi-square tests computed for Move1- Move5 are shown in Table 4. The following Table illustrates that the dissimilarities between the frequencies

of the two groups' applications of levels of significance for move1 is 0,436, for move2 is 0.038, for move3 is 0.076, for move 4 is 0.554, and for move 5 is 0.791 percent. For move2 the Asymp.sig was less than the P value demonstrating that there is a

significant difference in purposemove between groups. However, in other moves there were not any significant differences between the groups because the level of significance was greater than the p value (Asymp.sig > p value).

Table 4
Chi square test for each move

Move	Persian	English	Pearson Chi square	Asymp.sig
Introduction	18	15	0.606	0.436
Purpose	30	26	4.286	0.038
Method	30	27	3.58	0.076
Product	29	28	0.351	0.554
Conclusion	18	19	0.071	0.791

Discussion

The findings show that Iranian writers tended to use more introduction moves than English writers. In other words, that Iranian scholars have more tendency to apply introduction move. This finding contrasted with Ahmadi's (2009) of biological science and Abargooeinzhad and Simin's (2015) study of moves in Electronic Engineering, in which the researchers found that the English group applies introduction move more than their Iranian counterparts. According to Ahmadi (2009), Iranian writers "were more succinct in their accounts of previous research (p.116)." However, in this study, the researcher found that English writers were more precise in indicating previous research and introduction move in English group was considered non-compulsory, this is in line with Saboori and Hashemi (2013) in their cross disciplinary study, found that the introduction was less frequent move in three English groups in three disciplines: applied economics, applied linguistics, and

mechanical engineering. They reported that most frequent move pattern in these three fields was PMPrC pattern. In this study PMPrC was also the most frequent move pattern in English group (40 percent).

In conclusion Move, the writer has the opportunity of discussing the study by evaluating the discoveries and associating the reported research back to the wide research field. Similar to Ahmadi (2009), Abarghooi (2015) and many other studies in addition to the present study, Iranian writers apply the conclusion move less than English writers or write the conclusion move very briefly.

The main rhetorical dissimilarity, on the other hand, was that the English group had the most variety of move patterns. The English group was relatively heterogeneous in this regard (Table 3). Talebinzhad, Arbaby, Taki and Akhlaghi (2012) in their study of medicine also found that Iranian abstracts observed the IMRC sequence in all the cases, while English ones demonstrated

IMRC, IRC, MRC and RC sequences. The Persian group in the Mining Engineering field were more homogeneous and specifically develop the IPMPrC and IPMPr pattern as illustrated in Table 3.

However, there were similarities between the groups. Purpose, method, and product moves were clearly stated in both groups and the most frequent move in the Persian group was purpose move with 100% frequency, disclosed that Iranian writers are aware of the considerable significance of presenting the study by indicating major features and purposes of the research. Mining Engineering abstracts written by Persian native speakers were not entirely under the effect of either Persian or English societies, hence they finely follow Hyland (2000) model. Marefat and Mohamadzadeh (2013) research in literature also discovered that literature abstracts written by Persian native speakers are not completely under the impact of either Persian or English communities, but specify a norm of their own.

Marefat and Mohamadzadeh also evaluated the hypothesis introduced by, among others, Martin (2003) and Tahririan and Jalilifar (2004) that the way scholars compose is under the pressure of sociocultural factors, by displaying how the abstracts by Persian-speaking literature academic composing in English depart from those by English-speaking writers. Nonetheless, in current study Persian groups developed Hyland (2000) model better than English group. It may be due to the explicit instruction about the norms and conventions of abstract writing. The influencing element is not the native language, but rather the standards of the society for which the

academics write.

This study illustrated that there were similarities in two groups such as having high frequency in Move 2, 3, and 4 (above 90%) and both groups write method, purpose, and product moves straightforwardly and clearly. There was a significant difference in purpose move as illustrated by chi square computation, indicating that Iranian writers have more tendency to write the exact purpose of study. However, conclusion in English journals were lengthier and more informative than in Persian journals.

Pedagogical Implication

The findings of genre analysis usually have significant pedagogical implications for the specialist in ESP and EAP fields. Genre analysis could acquaint students with the explicit knowledge of genre standards and the proficiency of genre knowledge would aid students become members of their disciplinary community and discover and create more complex genres (Bhatia, 1997; Hyland, 2002; Loi and Evans, 2010). Moreover, realization of genre practices would help students to take advantage of comprehensive understanding of particular texts and would direct them in developing academic discourse following the required standards and therefore would enhance their opportunities for publication and persuasively engagement in international scientific discourse communities.

The findings of the present study would assist students of ESP courses in general and engineering students in particular to be familiar with the linguistic differences and the use of rhetorical structures used by native and non-native writers in developing a research article in English.

Conclusion

This study for the first time sought to discover the rhetorical Move operation frequencies in the Abstract chapter of Persian and English groups in the field of Mining Engineering. This research was conducted to discover what Move structures could be found in this section and to explore dissimilarities and similarities between the two groups. The description of Moves was carried out using Hyland's (2000) model. Based on the above - mentioned discussion except purpose move no significant difference was found between two groups under investigation. Both groups, especially Persian group generally followed the Hyland (2000) move patterns. Abarghooeinezhad and Simin (2015) found that Santo's model was disabled to predict abstract's rhetorical

moves in engineering disciplines. However Esfandyari(2014) reported Hyland's model is more competent to be applied to research article abstracts in computer engineering. These findings in addition to the result of the present study, indicated the comprehensiveness of Hyland's model, therefore the Hyland' five-Move pattern in abstract writing could be the norm for abstract writing in the field of engineering.

Future research should be conducted on a larger corpus regarding more disciplines. In addition, while the present research included only written discourse analysis, future research can take one step further by conducting interviews with the authors in order to investigate the socio-cultural items more comprehensively.

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