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Rhetorical Moves of Abstracts Written by TEFL Students and Molecular Biology Graduate Students- A Comparative Study

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ABSTRACT

The aim of the present study was to carry out an analysis of research thesis abstracts written by graduate students of two different disciplines; TEFL and molecular biology, Tehran University. Having presented a brief description of some theoretical concepts related to move analysis, the present study carries out a rhetorical move analysis on 48 abstracts randomly selected from among a pool of 93; 24 abstracts in TEFL and 24 belonging to the students of molecular biology. The analysis was aimed at comparatively investigating whether both the generic patterns of organizations found in abstracts coincide with Bhatia's (1993) abstract move pattern, and also ascertaining whether or not there are significant differences in employing the moves pattern. Findings of the study indicated that the abstracts in both disciplinary groups are found to exhibit the use of similar generic structure with the four moves to indicate the communicative purposes of the abstracts in the perspective of Bhatia's (1993) move structure. However some differences were observed in respect with certain moves.

Keywords: Rhetorical Moves, Genre Analysis, Bhatia's Move Structure, TEFL, Molecular Biology

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1. Introduction

Since English evolved as a lingua franca in the late 19th and early 20th centuries (Alcaez and Navarro, 2006), the interest in acquiring proficiency in English has sharply increased, particularly after the second war, as a result of technological and commercial changes (Hutchinson and Waters, 1987). Quickly after this, knowledge of English became a communicative need. Due to this special need, more specific forms of rhetoric and patterns are required to meet communicative needs and to fit various academic contexts. So far, various

strategies and theories have been proposed and employed in respect with improving teaching of English as a foreign language, writing skills in particular. Genre analysts have proposed certain reasons to argue that a genre- analytic approach to the understanding of text structure and to the teaching of writing will result in L2/ FL writing success. This approach helps the reader understand and grasp text objectives well, resulting in the change in applicability of English. Genre analysis is, indeed, the study of how the language is used in particular contexts such as business correspondence, legal writing, staff's

meetings, etc. (Richards and Schmidt, 2002). The framework used by genre analysts is based on items such as moves and steps.

A move is a unit relating to both the writer's purpose and the extent to which he wishes to convey his message or meaning. However, a step is a level of text unit lower than move, which provides a detailed perspective on the options open to the writer in setting out the moves in the introduction (Dudley-Evans and St. John, 1998). Furthermore a particular move, which occurs in every article in the corpus (i.e. the frequency is 100%), is called obligatory move. As it was mentioned before, the present study investigates thesis abstracts written by the students of two different disciplines; therefore, it mostly challenges the skill of writing. Most trainees find difficulties mastering over this skill (Salmani and Montazeran, 2012). This is because they are not well familiar with the accepted structures of different texts. The main problem is, indeed, lack of knowledge, understanding and awareness of conventional rhetorical structure of writing abstracts in English, which may lead to a deficiency in their ability to communicate effectively. In order to avoid such deficiency, one has to understand and learn global patterns of composing academic abstracts. Hence, the goal of the present study is to provide a genre-analytic approach to the understanding of text structure, and to the teaching of writing abstracts. Therefore, this study will seek to find out whether the research thesis abstracts in applied linguistics (TESOL Students) and molecular biology in Tehran University are compatible with Bhatia's (1993) pattern of abstract moves. Furthermore, it tries to find the significant differences (if any) between the moves employed in the thesis abstracts of the two

different disciplines. Finally, it indicates the obligatory moves in these abstracts.

2. Review of the Literature

Numerous studies (Sánta, 2015; Ebrahimi, 2016 etc.) have so far been conducted on various areas related to this research including ESP (English for Specific Purposes), genre analysis, and move analysis. According to Hutchinson and Waters (1987), there are three main motives behind the emergence of all ESP; the demands of a brave world, a revolution in linguistics, and focus on learners. Johnson and Johnson (1998) believe that ESP consists of all language plans which are designed for learners with various and clear needs. Another description for ESP was proposed by Swales (1985); "ESP is not a young cuckoo determined to eliminate all other birds from the nest it has infiltrated; rather, it is better seen as a recently-evolved species that best thrives in certain secluded and restricted kinds of habitat".

The term genre originates from the Latin word "genus" meaning kind or class. Bloor and Bloor (1993) believed that "genre is definite outcome of a social practice which can be depicted and taught because of its formal features". According to Bhatia (1993), "genre is a recognizable communicative event characterized by a set of communicative purpose(s) identified and mutually understood by the members of the professional or academic community in which it regularly occurs". As Miller (1984) states, a rhetorically sound definition of genre must focus not on the substance or the form of discourse but on the action that is used to accomplish. This statement seems to be more consistent with recent studies and findings.

According to Richards and Schmidt (2002), genre analysis is defined as "the study of how language is used in particular



contexts such as business correspondence, legal writing, staff meetings, etc.” Although this definition is not comprehensive enough to give a perfect picture of genre analysis, Bawarshi and Jo Reiff (2010) pointed to another aspect of genre analysis. They considered genre analysis as a tool to investigate the spoken and written discourse for applied purposes since the beginning of genre movement in 1980s.

Similarly, move analysis has also been the focus of many researchers and scholars. According to Hyon (1996), the analyses are done either on the lexicogrammatical features of a given text or the identification of rhetorical structure or ‘structural move analysis’. Nwogu (1997) referred to the rhetorical feature as “the identification of schematic units or moves”. The emphasis on move analysis goes to the extent that even Ding (2007) claims that move analysis is an inevitable pan in genre studies. According to him, moves are semantic and functional units of texts, which can be distinguished due to their communicative purposes and linguistic boundaries.

Now we refer to some previous studies conducted on rhetorical moves in abstracts. Lores (2004) provided a rhetorical structure analysis of 36 linguistics abstracts selected from four prestigious publications; *Journal of Linguistics*, *Applied Linguistics*, *Linguistics*, and *Journal of Pragmatics*. She found two principal types of structure for the stage of rhetorical move analysis; the IMRD structure and the CARS structure. She observed that a very small proportion of abstracts mixed both types starting with a CARS type in which and IMRD was embedded, which she called ‘combinatory structure’.

Martin (2003) applied Swales’ (1990) model to his contrastive study of

English and Spanish research article abstracts in the field of experimental social sciences in an attempt to identify the rhetorical preferences characterizing the academic styles of the authors. He analyzed a corpus of 160 randomly selected abstracts from prestigious English and Spanish journals; 80 English and 80 Spanish abstracts. Findings of the analysis indicated that the three moves proposed by Swales (1990) were clearly reflected in English abstracts. The research also revealed dissimilarities among English and Spanish authors in their production of abstracts. He concluded that many of the differences which occurred across the two languages can be attributed to various sociocultural factors.

Sarmaj (2005) analyzed the rhetorical structure and genre relations in his cross-disciplinary study of two genres; research article introductions and abstracts. The two related genres were compared and contrasted with each other. He has briefly explained the importance and interrelation of these genre sets: “these two genres, research article introductions and abstracts, appear to be related though the nature of the relationship is not completely clear. Both genres are related to the research article: one genre is central to the research article itself and the other has been said to be an article synopsis”.

It must be noted that move analysis has been a matter of interest to many researchers in recent years and, consequently, has been the focus of many studies. However, here we referred only to some of the related studies as examples.

3. Methodology

The present study is based on 48 out of 93 abstracts of master’s thesis in two different disciplines; TEFL (*Applied Linguistics*) and molecular biology. Data was gathered from the Website of Tehran

University. Cochran (1997) approach, as cited in Salmani and Montazeran (2012) and Salmani and Khakbaz (2011), was used to determine the sample size. It was decided that 48 abstracts from the pool of 93 should be included in the study. The sample was selected via simple random sampling approach. Then each abstract was given a code, and the number of words in each abstract was determined. Three structural move analyses were performed separately by the researcher, the supervisor, and an assistant. They coded the abstracts and identified the moves. The number of words and moves in every abstract was counted by these human coders. The moves were named according to the models cited by Swales (1990) and Bhatia (1993). In the case any difference was observed in coding, a fourth coder would be asked to code the problematic abstract.

The abstracts were read closely and certain contextual clues were considered such as headings and subheadings, citations, use of reporting verbs, tenses, hedging devices, discourse markers, and lexical items. The frequency of each move in every abstract was recorded, and based on this frequency the moves were classified as obligatory, conventional, and optional. Table 1 provides the readers with the frequencies corresponding to each of the three types of moves.

Table 1: Frequency-based move classification

Move classification	Frequency of occurrence
Obligatory	100
Conventional	66-99
Optional	less than 66

To estimate the convergent validity of the measure, the frequencies identified by the two coders were totaled, averaged and then correlated with the frequencies obtained by the researcher. This was carried out via a one-tailed bivariate correlation analysis using Spearman's *rho*. The

resultant value ($rho=0.894$) indicated a good level of validity.

In order to make sure of the reliability of the data, the Interceder Agreement was evaluated. The frequencies identified by human coders were correlated through another one-tailed bivariate correlation analysis using Spearman's *rho*. The reliability index was high enough to make the study reliable ($rho=0.031$).

Bhatia's Move Structure

Bhatia (1993) assigned this model to answer the four questions: (1) what did the author do? (2) How did the author do it? (3) What did the author find? And (4) what did the author conclude?

To illustrate this, he found the following four moves:

Move1: Introducing Purpose; the point of this move is to express the precise detail, and the intention of the researcher including the goals of the study.

Move2: Describing Methodology; this move is where the author denotes the research design, procedure or methods used in the study and, if necessary, the scope of the research.

Move3: Summarizing Results; in this move, the author highlights the important findings of the research including a solution to the problem. This move is regarded as the significant component of the abstract.

Move4: Presenting Conclusions; this move consists of the conclusions and interpretations of the results as well as some implications and applications of the findings.

This model has been accepted by many scholars including Salager-Meyer (1990, 1992), Santos (1996), Phantama (2000), and Promsin (2006).

4. Results and Discussion

Here, we report the results of rhetorical move analysis based on Swales'



(1990) and Bhatia's (1993) model carried out on research thesis abstracts from two different disciplines; applied linguistics and molecular biology. Table2 shows the number of words identified in each abstract.

Table2: Details of the Abstracts

Abstracts	Number of words	Abstracts	Number of words
Al1	224	Mb1	173
Al2	168	Mb2	212
Al3	147	Mb3	229
Al4	198	Mb4	263
Al5	224	Mb5	169
Al6	302	Mb6	296
Al7	215	Mb7	254
Al8	189	Mb8	264
Al9	156	Mb9	131
Al10	199	Mb10	264
Al11	285	Mb11	404
Al12	225	Mb12	235
Al13	214	Mb13	241
Al14	136	Mb14	298
Al15	226	Mb15	207
Al16	278	Mb16	245
Al17	154	Mb17	279
Al18	191	Mb18	263
Al19	170	Mb19	407
Al20	228	Mb20	188
Al21	141	Mb21	296
Al22	206	Mb22	346
Al23	308	Mb23	296
Al24	238	Mb24	

The structures of the abstracts from the two different groups were analyzed to see whether Bhatia's (1993) move pattern can be applied to the corpus. The results of this move analysis are summarized in table3, which show the existence of patterns of move structure in AL and BM abstracts.

Table3: Patterns of occurrence of moves based on Bhatia's move structure

Moves	Al abstracts containing move		MB abstracts containing move	
	Frequency	Percent	Frequency	percent
Move1 <i>Introducing purpose</i>	24	100%	24	100%
Move2 <i>Describing methodology</i>	24	100%	43	95.8%
Move3 <i>summarizing results</i>	23	98.8%	21	78.5%
Move4 <i>presenting conclusion</i>	9	37.5%	9	37.5%

Results of the analysis shows that the majority of authors tend to employ move1, move2 and move3 greatly. Move1 was considered as obligatory in both

groups. Move2 was considered obligatory in AL group but conventional in MB group. Move3 was considered conventional in both groups. Move4 was regarded as optional and since it occurred in the two groups equally, it was omitted by the researcher.

So far, it has been confirmed that Bhatia's (1993) move pattern can be applied to the abstract corpus in this study. What remains to be investigated is whether there are significant differences between the two groups in employing Bhatia's move pattern. For this purpose, certain statistics analyses are required. Since the data in this study was of frequency type one, Mann-Whitney U test was used. It compares medians rather than the means. It converts the scores on the variable to ranks across the two groups and evaluates whether the ranks differ significantly between the two groups. This test was conducted for all the four moves and results are summarized in tables 4-7.

Table4: Results of Mann-Whitney U test for move1

Group	N	Mean Rank	Median
Applied linguistic	24	14.35	1.50
Molecular biology	24	36.35	4.50
Total	48		3.50
Move1 introducing purpose			
Mann-Whitney U	44.500		
Wilcoxon w	344.500		
Z	-5.105		
Asymp.sig (2 tailed)	.000		

According to table4, in respect with move1, the Z-value is -5.105 and the P-value is 0.000, which shows a significant difference in employing move1 over the two disciplines. The Mean Rank (Al= 14.35 and MB=36.65) suggests that the students of molecular biology used move1 more than the students of applied linguistics. r should be calculated to estimate the size of the difference. $r=0.736$ indicates a large effect size.

Table5: Results of Mann-Whitney U test for move2

Move describing methodology	2	N	Mean Rank	Median
Applied linguistic		24	26.77	3.50
Molecular Biology		24	22.23	3.00
Total		48		3.00
Move2 Describing Methodology				
Mann-Whitney U		233.500		
Wilcoxon w		533.500		
Z		-1.145		
Asymp.sig (2 tailed)		0.252		

According to table5, in respect with move2, $z=-1.145$ and $p=0.252$ which is not less than nor equal to 0.05; hence there is no significant difference in employing move2 between TEFL students (MR=26.77, $n=24$) and the students of molecular biology (MR=22.23, $n=24$). Furthermore, $r=0.05$ shows the small size of the effect.

Table6: Results of Mann-Whitney U test for move3

Move summarizing results	3	N	Mean Rank	Median
Applied linguistic		24	23.60	2.00
Molecular Biology		24	25.40	2.50
Total		48		2
Move3 Summarizing result				
Mann-Whitney U		266.500		
Wilcoxon w		566.500		
Z		-0.461		
Asymp.sig (2 tailed)		0.645		

According to table6, in respect with move3, $z=-0.461$ and $p=0.645$. Again, since p is not less than nor equal to 0.05, there is no significant difference in employing move3 between TEFL students (MR=23.60, $n=24$) and the students of molecular biology (MR=22.23, $n=24$). Furthermore, $r=0.066$ shows the small size of the effect.

Table7: Results of Mann-Whitney U test for move4

Move Presenting conclusion	3	N	Mean Rank	Median
Applied linguistic		24	24.96	0.00
Molecular Biology		24	24.04	0.00
Total		48		0.00
Move4 Presenting conclusion				
Mann-Whitney U		277.000		
Wilcoxon w		577.000		
Z		-.263		
Asymp.sig (2 tailed)		.792		

According to table7, in respect with move4, $z=-0.263$ and $p=0.792$. Again, since p is not less than nor equal to 0.05, there is no significant difference in employing move4 between TEFL students (MR=24.96, $n=24$) and the students of molecular biology (MR=24.04, $n=24$). Furthermore, $r=0.037$ shows the small size of the effect.

According to what already mentioned, Bhatia's (1993) abstract pattern seems applicable to these thesis abstracts. Move 1 one obligatory in both groups and showed a significant difference in employing it, where molecular biology students tended to use it more than the TEFL students. Move 2 was obligatory in applied linguistics but conventional in molecular biology group. No significant difference was observed in employing this move between the two groups. Move 3 was conventional in both groups and again no significant difference was observed. However, move4 seems optional. Again no significant difference was observed. This finding is in agreement with those of Martin's (2003) observation of unconventional criticism of other research work.

5. Conclusion

The present study shed some light on the rhetorical structure of the research thesis abstracts in TEFL and Molecular Biology written in English by Iranian students, with Bhatia's (1993) four-move structure as an analytic framework. Findings showed that Bhatia's move pattern is applicable to the corpus of this study. In other words, students of both disciplines tended to employ all the four moves to constitute their abstracts. Based on the findings, move1, introducing purposes, was considered as obligatory move. Move2, describing methodology, and move3, summarizing results, were considered as



conventional moves; however, move2 was obligatory in applied linguistics abstracts. Finally move4, presenting conclusions, was found to be optional, which means that the authors hesitated to employ this move.

In order to show the differences between the two groups in using the moves, Mann-Whitney U test was conducted. Results revealed that there was a significant difference in using move1 over AL and MB abstracts. However, no significant difference was observed in using the other three moves.

The current study was conducted in EFL background, so the same can be conducted in ESL or native backgrounds; the results can also be compared. Also other research can take into account more author variables such as gender, years of writing experience, and proficiency.

Appendix 1:

Table for determining minimum returned sample size for a given population size for continuous categorical data

Population Size	Sample size					
	Continuous data (margin of error=.03)			Categorical data (margin of error=.05)		
	alpha=.10 t=1.65	alpha=.05 t=1.96	alpha=.01 t=2.58	p=.50 t=1.65	p=.50 t=1.96	p=.50 t=2.58
100	46	55	48	74	80	87
200	59	75	102	116	132	154
300	65	85	123	143	169	207
400	69	92	137	162	196	250
500	72	96	147	176	218	286
600	73	100	155	187	235	316
700	75	102	161	196	249	341
800	76	104	166	203	260	363
900	76	105	170	209	270	382
1000	77	106	173	213	278	399
1500	79	110	183	230	306	461
2000	83	112	189	239	323	499
4000	83	119	198	254	351	570
6000	83	119	209	259	362	598
8000	83	119	209	262	367	613
10000	83	119	209	264	370	623

Appendix 2: Sample Analysis

This appendix provides a sample analysis for an abstract of Applied Linguistics (TEFL) based on Swales (1990) and Bhatia (1993) models.

The purpose of this study was to find out if language proficiency in general and reading, structure, and vocabulary as components of language proficiency in particular had any predictive relationship with Iranian advanced students' writing quality when assessed holistically.	Bhatia, Move1
Also, this study tried to find out if there was any predictive relationship between a set of objective criteria for measuring the advanced students' writing quantity (i.e. some components of syntactic and lexical complexity), their writing quality, and language proficiency.	Bhatia, Move2
Thus, 84 candidates of TEFL doctoral entrance examination participated in this study being PhD candidates and getting the TOEFL score of more than the average.	Bhatia, Move3
All subjects were among advanced learners of English in Iran.	Bhatia, Move2
The instruments of the study also included both a TOEFL test (as an indicator of the participants' language proficiency) and an essay-type writing test (as a benchmark showing the participants' writing performance in English which was rated both qualitatively and quantitatively).	Bhatia, Move2
As a result, language proficiency and its components (except vocabulary) were found to have significant predictive relationship with writing quality.	Bhatia, Move3
Moreover, some components of syntactic and lexical complexity (as quantity criteria) had significant predictive relation with writing quality and language proficiency.	Bhatia, Move3
The findings may have certain implications concerning language teaching and assessment and the identified objective criteria for assessing ESL writing are susceptible to be generalized in other settings.	Bhatia, Move4

Appendix 3: Sample Analysis

This appendix provides a sample move analysis for an abstract of Molecular Biology based on Swales (1990) and Bhatia (1993) models.

Glycation, one of the post-translational modifications of proteins, is a non-enzymatic reaction initiated by the primary addition of aldehyde or ketone to the amino groups of proteins.	Bhatia, Move1
In the early stage of glycation, the synthesis of intermediates leading to formation of Amadori compounds occurs. In the late stage, advanced glycation end product (AGE) are irreversibly formed after a complex cascade of reactions.	Bhatia, Move1
It has recently become clear that glycation also affect diabetes-related complication and physiological aging and neurodegenerative disease such as Alzheimer's disease.	Bhatia, Move1
In this study, HSA (10mg/ml) incubation in PBS (50mM) with Glucose (40mM) and different concentration of papaverine (25,100,250,500µM) for 42 days at 37C and also HSA incubation alone (control), with Glucose (40mM) respectively under the same conditions.	Bhatia, Move2
After the incubation samples dialysis and determination concentration and preparation for CD, Fluorescence and absorbance techniques were done.	Bhatia, Move2
The analysis of result showed that papaverine changed the protein structure and exposed the glycation site (lys residue) for Glucose.	Bhatia, Move3
Thus, papaverinase the best condition for Maillard reaction.	Bhatia, Move3

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