Genre Analysis of Conclusion Sections of Pakistani Research Articles in Natural and Social Sciences

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Abstract
This study has investigated macro-structures (Move Analysis) of conclusion section of Research Articles (henceforth RAs) in Social Sciences and Natural Sciences. The purpose of the study is to find out the differences in RAs conclusion sections across various disciplines in terms of moves and steps constituting each move. For this purpose, 50 RAs conclusions have been selected for analysis, 25 each from social sciences and natural sciences. RAs have been selected randomly from different journals written by Pakistani authors. A new model has been proposed for the move analysis by following Yang & Allison's (2003) and Bunton's (2005) models for conclusion section. This study has revealed variations in move structure of RAs conclusions across various disciplines in Pakistani context. This study may contribute an understanding of the nature of conclusions of RAs across various disciplines. It may be helpful for both writing instructors, whose purpose is to have their students succeed in using this component of genre, and to writing students, who are willing to take part in distinct discourse communities.
Key Words: Genre Analysis, Research Article Conclusion, Move Analysis, Disciplinary Variation

1.Introduction

Academic writing, as an important means of communication, has been playing an important role in academic discourse communities. This position of great centrality has enabled written academic discourse to be appreciated and analyzed from various aspects. Academic writing such as RA is considered a separate genre. Thomas and Hawes (1994) have said that RA is identified by "a recognizable communicative purpose and by the presence of characteristic features with standardized form, function, and presentation that are part of its general conventions" (p. 131). The ability to write academic research paper effectively is not only based on linguistic competence, but also on understanding of the rhetorical structures used in academic writing as acknowledged by the discourse community.

Genre analysis has received wide spread attention now-a-days. An increasing amount of attention has been paid to the structure of research writing ever since Swales's (1990) discussion of communicative moves in RAs. Genre analysis is a useful instrument in unfolding and connecting the linguistic features of a genre to their function and purpose. It provides a technique to identify moves and linguistic features found in genres. Genre analysis describes the way in which texts are structured and organized (Hopkins & Dudley-Evans, 1988). Genre analysis of RAs has been motivated by pedagogic reasons, a factor that is becoming ever more important with the rapid growth in the number of research writers.

Move analysis is a genre-based approach which is used to recognize the structure of RAs, it has recently become an important area of research. It is study of language use by the author to form a semantic unit by recognizing its forms and functions in a particular discourse. A number of studies have explored the structural organization of RAs sections, such as, the Introduction (Samraj, 2002; Swales, 1990), the Methods (Bruce, 2008; Harwood, 2005; Lim, 2006), the Results (Brett, 1994; Williams, 1999 Yang and Allison, 2003), the Discussion (Holmes, 1997; Peacock, 2002), and all the four sections (Kanoksilapatham, 2005; Nwogu, 1997; Pho, 2008; Posteguillo, 1999). Therefore it is evident that analyzing RA sections, using the move analysis method, has caught the attention of many researchers.

As far as conclusion section of the RA is concerned, there is a less focus on it because conclusion usually seems to be the component of discussion section of an RA. Weissberg and Buker (1990) have commented about the distinction between discussion and conclusion that the last section of RA is "usually titled discussion (but) sometimes is called conclusions" (p.161).Theoretically, the Discussion section is concerned with the interpretation of the results, while the Conclusion section highlights the value of such findings and explains in what way these findings add something to the research field. So the boundary between the two sections is supposed to be conceptually distinct in terms of their communicative function.

Yang and Allison's (2003) study of conclusion sections of RAs in applied linguistics, is the pioneering work in this sub-genre. In Pakistan, research focusing on the rhetorical move structure of RAs is very limited. Shehzad (2012) has conducted study on Computer Science RAs Introductions, yet, no attention has been paid to the other sections of RA in Pakistan. The present study aims to fill this gap in prevalent research and sets out to discover the common generic features, shared by the conclusion sections of different disciplines.

2. Methodology

2.1 Data Selection

Two sets of data were compiled for present study. The first data set was composed of 25 randomly chosen conclusion sections of RAs published in different journals in the field of Social Sciences. The second data set was comprised of 25 randomly selected conclusions of published RAs in the field of Natural Sciences. In Natural Sciences RAs were collected from five disciplines with same amount in each discipline: Agriculture (5), Botany (5), Chemistry (5), Medical (5) and Pharmacy (5). On the other hand, in Social Sciences RAs were also collected from five disciplines: Economics (5), Education (5), Applied Linguistics (5), Political Science (5) and Sociology (5). RAs were selected from several Pakistani and International Journals from 2009 to 2014. All research papers are available online. The researcher collected the abovementioned data randomly to make sure that the selected RAs represent Pakistani research territory and the selected conclusions represent the conclusion in each RA.

2.2 Data analysis

This study used both qualitative and quantitative data analyses methods, consisting frequency counts and text analyses of the RA conclusion. For example, for the rhetorical move-step structure, first the data was examined quantitatively by counting each instance of moves in both the data sets. Then, the function of each move was illustrated qualitatively. The analysis of our selected data was carried out in two main stages. In the first stage, the moves were identified along with their communicative functions and structures/patterns in terms of their variation in order, missing and the repeated moves. In the second stage, according to their occurrence and frequencies, the moves were categorized as: obligatory, conventional or optional. Then based on the frequencies of moves and steps variation, similarities and differences between both data sets were dealt.

At the time of making text files, it was noticed that RAs conclusion sections in both fields were discussed under different titles (See Table 1). Nevertheless they were given the status of concluding sections.

Table 1. Titles of RAs Conclusion sections in Present corpora

Title	Frequency
Conclusion	33
Conclusions	12
Concluding Remarks	1
Conclusion and Policy Implications	1
Conclusions and Recommendations	1
Findings and Conclusions	1
Summary and Conclusions	1

2.2.1   Data analysis instrument

Some researchers have used different models to categorize the rhetorical moves in RAs conclusion according to their beliefs about function of conclusion section. This study adopted a two level move and steps analysis to delineate the schematic structure of conclusion sections. The studies of Swales (1990), Yang and Allison (2003) and Bunton (2005) were taken as starting points. Yang and Allison (2003) proposed a model comprising of three major moves for RAs conclusion section. First two moves of their model Move 1 'Summarizing the Study' and Move 2 'Evaluating the Study' were selected for our recent corpus except the third one. Move 3 'Deductions from the research' Yang and Allison's (2003) model was not applicable to our corpora because it was comprised of ten different disciplines. While, Move 3 'Deductions from the research' in their study was proposed only for one discipline that is Applied Linguistics. Therefore Move 3 'Practical implications and recommendations and Move 4 'Future research' has been borrowed from Bunton's model (2005) to meet the requirements of our present corpus. In this study a modified version based upon the models suggested by Yang and Allison (2003) and Bunton (2005) has been used which could best illustrate the purpose of moves and steps in the selected corpus of RAs conclusions.
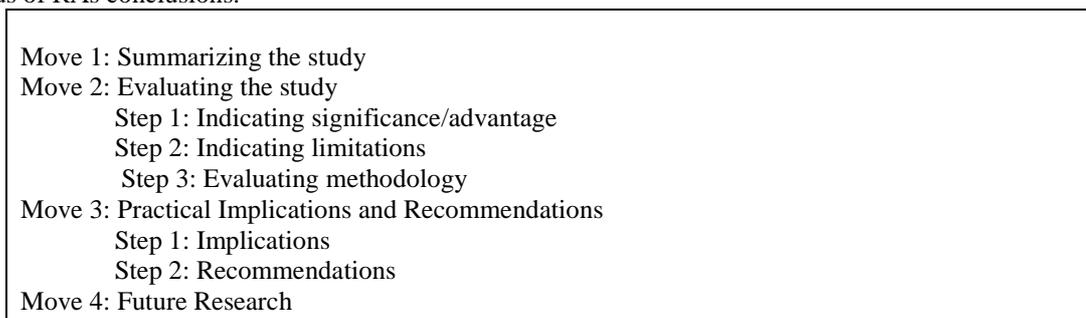
Move 1: Summarizing the study
Move 2: Evaluating the study
        Step 1: Indicating significance/advantage
        Step 2: Indicating limitations
         Step 3: Evaluating methodology
Move 3: Practical Implications and Recommendations
        Step 1: Implications
        Step 2: Recommendations
Move 4: Future Research

Figure 1. Proposed model for present study

 Percentage of moves and steps was calculated as

Percentage = Number of moves or steps / Total number of conclusions X 100
For inter-rater reliability, another researcher was asked to identify the moves in both corpora as well. A comparison of the two analyses yielded a high inter-reliability rate: 90 %. Then the discrepancies between analyses were sorted out by discussion between the rater and researcher.

3. Results and Discussion
As it has been described earlier that the primary objective of the study is to examine the rhetorical structure of conclusion section of the published RAs, so for this purpose, all text files have been examined to find out the move structure. The hand-tagged move structure analysis of the two corpora has been carried out within the framework of Yang and Allison (2003) and Bunton (2005). The moves are further subdivided into multiple steps, because move deals with content in general terms while step is more specific in the treatment and organization of content.

3.1 Move Structure of Natural and Social Sciences RA conclusions
The results are based on the identification of moves by the researcher by using a modified model for RAs conclusion. The move structures found in our corpus have revealed that Pakistani writers do not follow any rigid move structure in writing RAs conclusions. Many of the RAs in Social Sciences as well as in Natural Sciences seem to follow individual pattern which may be according to the demands of their study. While All RAs conclusions begin with some kind of Move 1. Total seven move structures have been found in Natural Sciences RAs conclusions and thirteen in Social Sciences. So, the findings of our analysis advocate that there is more variety of move structures in of Social Sciences than the discipline of Natural Sciences. Move structure which are common in both disciplines are [M1], [M1-M2], [M1-M2-M3] and [M1-M3]. The [M1-M2-M3-M4] structure has been found only in Social Sciences corpus. However, this pattern has not been applied to any of the Natural Sciences conclusion sections.

Besides this chronological move pattern, some intervening moves have been found in Social Sciences corpus, e.g., [M1-M2-M3-M2-M4] and [M1-M3-M4-M3-M1-M3-M1]. So, on the basis of move structures found in both corpora, it can be assumed that the patterns of both disciplines are not completely conformed to the proposed model of present study. The results have revealed that recycling of moves is not found in Natural Sciences except Move1. This may be due to the small size of RAs conclusions in the disciplines of Natural Sciences. In Social Sciences corpus, a cyclical characteristic has been found in the form of the recurrence of Move 1, Move 2 and Move 3in the move structures. These three moves have been found either repeated solely in the structures (e.g. M1-M2-M3-M2-M4) or coexisted (e.g. M1-M2-M1-M2). The cyclicity of Move 1(Summarizing the study) found in the present study is conformed to Yang and Allison's (2003) findings.Move1 is the most cyclical move in Yang and Allison's (2003) study ; however, this move has also been reiterated many times in Social Sciences conclusion sections in the present study.

Most of the conclusion sections in Natural Sciences have showed an incomplete move structure, by omitting one or two moves in the structures. On the other hand, move structure is linear to some extent in the discipline of Social Sciences. This indicates that there is disciplinary variation in move structure of Social Sciences and Natural Sciences RAs conclusion sections.

3.2 Occurrence of Moves and Steps
The percentage and frequency of the occurrence of move throws light on its status whether it is obligatory, conventional or optional in nature. After seeking guidance from literature, following criterion has been to label the moves:
Moves having 100% occurrences are identified as obligatory. Moves having 90% occurrences are considered as conventional. Moves having least occurrences in representative data are labeled as optional.

The detailed description of distribution of moves in conclusion sections of both disciplines is presented below.

Table 2. Frequency of Moves and Steps found in Social Sciences and Natural Sciences RA conclusions

Moves (M) Steps (S)	Natural Sciences		Social Sciences	
	N	%	N	%
M-1. Summarizing the study	25	100	25	100
M-2. Evaluating the study	3	12	10	40
S-1. Indicating significance/advantages	2	8	9	36
S-2. Indicating limitations	1	4	3	12
S-3. Evaluating methodology	0	0	1	4
M-3. Practical Implications and Recommendations	12	48	16	64
S-1. Implications	2	8	2	8
S-2. Recommendations	11	44	16	64
M-4. Future Research	4	16	5	20

Based on the analysis, four moves have been found in the selected corpora and their frequencies of occurrence are different. According to its frequency, Move 1 (Summarizing the study) has been found obligatory move in both datasets, with the frequency of 100 % in both natural and social corpus. A noticeable difference has found between the frequency of Move 2 and Move 3. The findings have revealed that the frequency of Move 2 (Evaluating the results) of the Social Sciences corpus is three times higher than that of the Natural Sciences corpus (SS: 40 % and NS: 12 %). The frequency of Move 3 (Practical implications and recommendations) is 64 % in Social Sciences and 48% in Natural Sciences. On the basis of their frequencies, these two moves have been recognized as optional in the both corpora. Move 4 has occurred at same frequency in both corpora to some extent (SS: 20 and NS: 16%) and it has also been considered an optional move.
Now each move is illustrated and in examples citation from the original text is included.

Move 1: Summarizing the study
The primary objective of this move is to summarize the research or study by highlighting the findings. Here authors provide a summary of the whole study—but not just a summary of the results/findings. This move appears in the very beginning of the conclusion and can be clearly identified. The occurrence of Move 1 in the present study has been conformed to Yang and Allison's (2003) findings. There has been no marked variance found in both disciplines regarding the frequency of Move 1. It was the dominant move in both sets of data.

In this move, main purpose, method, reference to previous research, and/or reviewing research results briefly are usually found. This implies that Pakistani writers consider it compulsory to review and restate their study in the starting section of conclusion. Moritz et al. (2008) have carried out a study on RAs conclusion and Move 1 'Summarizing the study' is the least frequent move in their study. On the other hand, in Amnuai and Wannaruk (2013) study on conclusion sections of RAs, Move 1 has higher frequency than other moves. In this move authors often use such lexicogmmatical signals as the present perfect tense together with such words as 'study' and 'research'.
Examples:

SS [M1]   *This study has been conducted to find* *the effects of trade deficit on the economy of Pakistan in which trade deficit is the independent and gross domestic product, foreign direct investment exchange trade are the dependent variables. Depending on the availability of data we have selected the longest possible sample period to avoid the small sample bias. A sample period of 24 years has been selected for this study for the period of 1988-2011 with annual frequency.....*

NS [M1]   *According to the data from Table 1, it was pointed out that highest uptake of Cu, Cr and Ba was found in Jew-83 variety. Maximum uptake of Al was detected in Jew-87 where as the highest absorption of Co and Ni was observed in Haider-93.In the same way highest uptake of Pb and Cd were detected in the Quina cultivar.* ***It can be concluded that*** *there were remarkable differences in up taking the 8 metals in different varieties.............*

Move 2: Evaluating the study
In this move authors justify the study by using three available options, which are 'Indicating significance/advantage', 'indicating limitations', and 'Evaluating methodology'. The frequency of occurrence of Move 2 is visibly different between the two corpora: the frequency of the Natural sciences corpus is 12 %, while in the Natural sciences is 40 %. Authors often make this move to judge their study in term of its significance, limitations, delimitations, strengths, and weaknesses. So, the findings of our selected corpus have shown that in Natural sciences authors give less preference to Move 2. They mostly jump to the Move 3 after Move 1 by ignoring the significance of Move 2. In this move authors use positive verbs as it has been shown in the examples.

Move 2 Step 1: Indicating significance/ advantages
The purpose of this step is to state the usefulness and importance of the study regarding the study's applications or implications. Prominent words which are used to indicate this step include discovers, helpful, useful etc.
Examples:
SS [M2 S1]   *The present research is helpful* *in proving the corpus driven methodology as a very successful technique....*

NS [M2 S1]   *In addition, it can be used as an initial treatment* *in those cases of CRF where the prospects of regular follow-up for long-term dialysis are extremely poor......*

Move 2 Step 2: Indicating limitations

The function of this step is to state the limitations and weak points of the study. It has been found in only one Natural sciences conclusion section, while, it has been found in three Social Sciences conclusions. It implies that Pakistani researchers use M2 S2 less frequently than M1 S1 in both disciplines.

Examples:

SS [M2 S2]   *However, in this study there remain many limitations* that pave way for future research on this topic….

NS [M2 S2]   *This study only comprises* the taxonomic position of algae….

Move 2 Step 3: Evaluating methodology

In this step authors evaluate their research methodology in terms of its strengths and weaknesses. As shown in above Table, Move 2 Step 3 has least frequency as compared to other steps of Move 2 in both datasets. This step has been occurred in only conclusion section of Social Sciences, although, its frequency is zero in Natural sciences. To state this step, Present tense has been used by the authors.

Example:

SS [M2 S3]   *The research shows that **the corpus driven methodology has been proved very successful** in fulfilling this objective….*

Move 3: Practical implications and recommendations

The function of this move is to state, keeping in view the overall study, what the research adds to existing knowledge in the relevant area. This move is further articulated by two steps, namely 'Implications' and 'Recommendations'. In this move research writers make suggestions regarding solutions to certain problems provide implications as well. The mutual comparison reflects higher frequency of this move in Social Sciences discipline suggesting that writers of Social Sciences are more inclined to present recommendations for the purpose of exhortation of the readers.

Move 3 Step1: Implications

This is the step where the authors offer some useful applications of their studies. The frequency of this step in both disciplines is same i.e. 8%. In Bunton's (2005) study Practical implications are more common in Natural sciences conclusions than in Social Sciences ones. In the case of present study, the situation is different because Move 3 step 1 is having equal frequency in both disciplines. Certain words, such as implication, application, help and modal verbs have been used in our corpora.

Examples:

SS [M3 S1]   *These findings have some policy implications* for the policymakers and development partners…..

NS [M3 S1]   *Such studies may also provide some information to botanist and taxonomist in screening of species* used for various purposes i e food, cosmetics, and fodder for cattles…

Move 3 Step 2: Recommendations

This step offers suggestions as to how knowledge claims can be made for explicit purposes, both in real world and educational contexts. In present study, the fragments of texts which indicate explicitly ways of using research findings in practical life are frequently used.   The following examples clearly display that making claims about research findings does not only authenticate the studies but also shows that how new knowledge can be put to practice life and pedagogical use.

SS [M3 S2]   *The media should play its part to minimize its intelligibility gap. As the acceptability of a new language variety depends on intelligibility **so it should not be compromised and media could play its part** in   removing the barriers in intelligibility of this variety……….*

NS [M3 S2]   *Moreover, **we recommend that** a simple manual of herbaceous flora including local names and uses of species must be made for identification.**Policy for the conservation of Natural plants should be also made…..***

Move 4: Future Research

The main purpose of this move is to present some practical guidelines for future research studies, which can be helpful and useful for forthcoming researchers. Its nomenclature is also based on Bunton's (2005) model of

conclusion section. Future research is recommended to promote knowledge growth. Therefore, it is logical to advocate that further research must be included in the Conclusion section because it is almost a required feature of it. Move 4 is having least occurrence in both data sets, so, Pakistani researchers are ignoring this important move in conclusion sections. Pakistani researchers seem unaware of the importance of relating their findings with the outer world or highlighting the issues generated from their study for promoting future research in the field .The less frequent insertion of Move 4 in both disciplines suggests that Pakistani research territory is not as highly competitive.

A remarkable difference is observed in the frequency of occurrence of Move 4 in conclusions of both disciplines of this study.

Example:

SS [M4]   ***This study leads to the need of an extended study*** *in terms of geographical area, sample size and the factors causing difficulties in writing English.…*

NS [M4]   ***Further extensive study*** *on different doses with acute and chronic administration of the agent is necessary.…*

To sum up the above discussion we can say that our study has revealed disciplinary and culture specific variations in RAs conclusions in Pakistani context.

4. Conclusion

This study has identified the overall rhetorical pattern of the conclusion sections RAs written by Pakistani researchers in Social Sciences and Natural Sciences. It has also highlighted the variation between the two disciplines at move and step level. Models proposed by Yang and Allison (2003) and Bunton (2005) have been used as starting points and afterwards the researcher has developed a modified model to suit the variation of pattern employed by Pakistani writers in writing RAs' conclusions. According to the analysis of the representative data, Move 1 "Summarizing the study" has been found obligatory with 100% occurrence in the conclusions of both disciplines. This move occupied the maximum space in both corpora. Move 2, 3 and 4 were incorporated as optional moves. Move structures of RAs conclusions have also shown disciplinary variation in both disciplines.

From pedagogical perspective, conclusion sections written by Pakistani authors do not show a consistent rhetorical pattern creating a need to raise their awareness about genre analysis in general and academic text in particular, so, that they can gain acknowledgement at international level. The present study has focused mainly on disciplinary variation with a limited corpus of 50 conclusion sections. Therefore, more studies are required to have in depth investigation of the internal structure of RAs conclusions to investigate variation at subject level.

Anyhow, the study may serve as a useful material for students to get familiarized with the generic structure of concluding sections. It may also provide an insightful guidance to the future researchers to explore this least researched area of RAs conclusions.

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