

The Investigation of the Textual Organization of Research Article Discussion Sections in the Field of Second Language Writing

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Abstract

This research aims to investigate the textual organization of research article discussion sections in second language writing in order to reveal how expert writers in the discipline prefer to construct their discussion. Move analysis was conducted on a corpus of 103 research article discussion sections collected from five established journals. The analysis reveals that the research article discussion sections in second language writing could be described with eight moves with some moves containing steps. It was found that the commenting on results move, reporting results move and deductions from the research move were most frequent in the corpus. These findings suggest that the main function of the discussion sections is to report and comment on results, but the emphasis is placed on commenting. Besides, writers in this discipline also prefer to provide suggestions, areas for future studies and implications for teaching and learning in this section. Managing the section move, used to announce the outline of the section, was also identified in the corpus. This is a move that has never been reported before in previous studies on discussion sections. This finding suggests a strategy that can be used to handle the complexity of the discussion sections and make them reader friendly. The analysis also identified some typical patterns of moves occurring in a corpus. This study contributes to the fields of genre analysis, English for Specific Purposes and English for Academic Purposes, and provides guidance to novice or less experienced writers who want to write for publications.

Keywords: genre, move analysis, research articles, second language writing, textual organization

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Introduction

In the academic world, research articles are a key to knowledge, reputation and achievement. However, writing a research article and getting it published, especially in international academic journals where English is used as a medium of communication, is not an easy task. Therefore, there have been many efforts to investigate the characteristics of research articles to help writers, especially less experienced ones and nonnative English speakers who are linguistically disadvantaged, to be familiar with the research article genre and have sufficient knowledge and ability to pursue their goals. A number of studies have been conducted to explore various aspects of research articles such as textual organization and other text features including uses of tenses, voice, hedging, modality, reporting verbs, pronouns, and citations (e.g. Crompton, 1997; Matsuda, 2001; Hyland, 2001).

Textual organization is one of the areas of writing for publications that has received particular attention from genre analysts. Following Swales' Create a Research Space (CARS) model of move analysis (1990), substantial studies have been conducted to analyse the move structure of research articles in various disciplines. The model has been used to study both the whole body of research articles (e.g. Kanoksilapatham, 2005), and a particular section in research articles such as the method section (Wood, 1982; Nwogu, 1997; Lim, 2006), the results section (Brett, 1994; Thompson, 1993) and the discussion section (Hopkins & Dudley-Evans, 1988; Swales, 1990; Nwogu, 1997). Together, the studies conducted demonstrate that move structures vary across disciplines. It was also found that differences in move structures exist even between disciplines that are closely related (e.g. Samraj, 2002; Suntara & Usaha, 2013) and between subdisciplines belonging to the same discipline (e.g. Ozturk, 2007; Kanoksilapatham, 2015; Li & Pramoolsook, 2015; Atai & Habibie, 2012).

The textual organization of research articles as wholes and of their particular parts, has been continually studied. One of the most difficult parts to write and thus one that had received attention from genre analysts is the discussion section. There are several studies done on the discussion sections of academic disciplines in natural science (e.g. Peng, 1987; Hopkins & Dudley-Evans, 1988; Posteguillo, 1999; Kanoksilapatham, 2005; Basturkmen, 2012) and social science (e.g. Holmes, 1997; Yang & Allsion, 2003; Amnuai & Wannaruk, 2013). These studies reveal that the discussion sections are not linear like the introductions but cyclical. However, the typical patterns of moves vary among disciplines. For example, a typical cyclical order found in Posteguillo's (1990) study on 40 research articles from 3 different academic journals in computer science was Move 2 (Statement of result) followed by Move 7 (Deduction and hypothesis) or Move 2 followed by Move 8 (Recommendation). A cyclical pattern observed in Kanoksilapatham's (2005) study on research article discussion sections in biochemistry was Move 12 (Contextualizing the study) followed by Move 13 (Consolidating results). In addition, the models proposed to describe the organization of the discussion sections also vary.

The studies into the textual organization of the research article discussion sections in different academic disciplines so far have provided better understanding of the function and characteristics of the section. This section seems to have higher complexity than other sections.

However, compared with other sections, this section still receives less attention. Given the importance of specificity of learners' needs and expertise in English for Specific Purposes and the complexity of the section, the discussion section should be explored more.

From the study into the textual organization of research article introduction sections (Ozturk, 2007), the findings indicate that the move structure of introductions in second language writing seems to have a great deviation from the move structure proposed by the CARS model. These results show that this discipline contains some distinctions, and this makes it interesting to explore further other sections such as the discussion section. Besides, the research article discussion section of this discipline is still under researched. Exploring the textual organization of the research article discussion sections in this discipline should fill the literature.

Hence, the present study aims to investigate the textual organization of research article discussion sections in second language writing in order to find out how expert writers in this discipline prefer to organize their discussion. The study is limited to research articles written in English and contributing to English as a Second Language. The results of the study can contribute to the fields of genre analysis, English for Specific Purposes (ESP) and English for Academic Purposes (EAP), and will be useful to novice or less experienced writers who write for publications.

Genre analysis and research article discussion sections

This section briefly discusses Swales' genre analysis which is a framework of this study and reviews studies previously done on research article discussion sections.

Swales' genre analysis

The concept of genre is diverse according to the linguistic perspectives it draws on. These different linguistic perspectives also alter the study of genres or genre analysis. Among the genre researchers and theorists, it is the work of Swales (1981, 1990, 2004) working in the ESP tradition, that provided the most detailed proposal for genre definition, and the idea was later developed by Bhatia (1993). Generally, genre analysis is 'the study of situated linguistic behavior in institutionalized academic or professional settings' (Bhatia, 2002, p. 22). For Swales and Bhatia, communicative purpose is the main criterion used for identifying genre. Conducting analysis of genre in the ESP tradition, analysts look at various academic and professional texts, sometimes focusing on one or more sections of the texts. They may either identify the staging of content of a genre in terms of moves and steps or examine the linguistic features which are commonly employed for the realization of these moves and steps.

According to Swales (2004, p. 228), a *move* is "a discursual or rhetorical unit that performs a coherent communicative function in a written or spoken discourse". It is a segment of text which is shaped by a communicative function. Each *move* is comprised of a number of elements which constitute information in the move (Nwogu, 1997). These elements are referred to as 'steps' by Swales (1990) or 'strategies' by Bhatia (1993). In order to identify moves and their constituent elements (steps), both the grammatical features and the context in the discourse should be taken into account (Swales, 2004; Nwogu, 1990; Yang and Allison 2003).

ESP genre analyses are largely based on Swales' (1981, 1990, 2004) work. He proposed a three-move structure for research article introductions, known as Create a Research Space (CARS) model. It is Swales' model of move analysis that has been influential in the field of ESP and provided implications for teaching and learning of language in academic and professional domains.

Swales' CARS model of move analysis has been used to analyse a variety of texts in both academic and professional genres such as university lectures (Thompson, 1994; Shamsudina & Ebrahimib, 2013) and business letters (Pinto dos Santos, 2002). The research article is one of the genres that have been examined extensively with the CARS model. Due to the increasing importance and popularity of research articles as a main channel to circulate knowledge among scholars, and the difficulties in producing such a genre, especially for non-native speakers, substantial research has been conducted to analyse the textual organization or move structure of research articles, both the whole body of research articles and a particular section of research articles, in various disciplines.

Move analysis of research article discussion sections

One of the sections in research articles that has received attention from genre analysts is a discussion section. Genre analysts have attempted to study this part and see how it is constructed. Early studies were conducted by Belanger (1982), Peng (1987) and Hopkins & Dudley-Evans (1988). They conducted move analysis and described discussion sections with different number of moves. For example, Belanger (1982) analyzed 10 discussion sections from articles in the discipline of neuroscience and identified nine moves: 1) Introduction, 2) Summarizing results, 3) Conclusion, 4) What results suggest, 5) Further questions, 6) Possible answers to further questions, 7) Reference to previous research, 8) Reference to present research, and 9) Summary/Conclusion. Hopkins and Dudley-Evans (1988) studied Msc dissertations from the Department of Biology at the University of Birmingham and articles on irrigation and drainage appearing in international conference proceedings. They identified a list of 11 moves: 1) Background information, 2) Statement of result, 3) (Un)expected outcome, 4) Reference to previous research (Comparison), 5) Explanation of unsatisfactory result, 6) Exemplification, 7) Deduction, 8) Hypothesis, 9) Reference to previous research (Support), 10) Recommendation and 11) Justification.

All studies found cyclical patterns in research article discussion sections; however, typical cyclical orders vary. A typical cyclical order found in the study by Belanger (1982) was statements summarizing results, comparing them to mainstream research, and interpreting and extending the results into speculations. Peng (1987) conducted a move-based analysis of 10 chemical engineering discussion sections and observed two types of cyclical patternings. One cycle involves a research question. The other cycle involves the author's comments on the findings. Holmes (1997) studied the structure of discussion sections of articles from 3 disciplines: history, political science and sociology. A typical pattern was Statement of result or Background information preceding Generalization or Reference to previous research. These cyclical patterns occurred because after stating the research results, the author added a comment in the form of either a hypothesis or a suggestion for further research.

The findings regarding obligatory and optional moves are also different. Hopkins and Dudley-Evans (1988) identified Move 2 (Statement of result) as an obligatory move. This move

appeared many times, almost always at the beginning of a cycle, it was thus considered the “head” move in a cycle. All other moves were optional. However, Move 2 (Statement of result) was not reported as an obligatory move in Holmes (1997). It was found that no move was completely obligatory in social science texts. The most common moves were Move 6, (Generalization) and Move 2 (Statement of result). Move 2 (Statement of result) was also identified quasi-obligatory in Swales (1990) and Posteguillo (1999).

Later work still confirms cyclical patterns in research article discussion sections. The number of moves used to describe the structure of discussion sections varies. The findings regarding typical cyclical patterns or sequence of move occurrence and obligatory moves remain different. The differences of move occurrence and sequence reflect the variation of move structure caused by academic disciplines. More move analysis models have thus been developed to describe research article discussion sections written in various disciplines. Analysts also try to improve the methodology in order to increase the reliability and the generalizability of the developed models and the research results. They try to refine the categories of moves. Some studies (e.g. Nwogu, 1997; Kanoksilapatham, 2005; Yang & Allison, 2003) added sub-moves or steps to their model of analysis in order to describe the structure of research article discussion sections in the discipline being studied in more details.

For example, Nwogu (1997) examined the structure of information in the medical research articles and found that the discussion sections in medical research articles consisted of 3 moves: Highlighting overall research outcome, Explaining specific research outcomes and Stating research conclusions. Nwogu used sub-moves to describe the structure of medical research papers. Explaining specific research outcome could be realized by 5 sub-moves which are Stating a specific outcome, Interpreting the outcome, Indicating significance of the outcome, Contrasting present and previous outcomes and Indicating limitations of outcomes. Stating research conclusions could be realized by 2 sub-moves which are Indicating research implications and Promoting further research.

Kanoksilapatham (2005) studied randomly selected 60 research articles from five journals in the field of biochemistry. Based on the analysis of the corpus, she proposed a two-level rhetorical structure (moves and steps) to describe how the information in biochemistry research articles is organized. Her study revealed three conventional moves: Contextualizing the study, Consolidating results and Stating limitations of the study, and one optional move: Suggesting further research.

Yang and Allison (2003) examined 20 research articles in applied linguistics from Result sections to the final sections of research articles. They also proposed a two-level rhetorical structure (moves and steps) to describe the organization of research article discussion sections in applied linguistics. Move 4 (Commenting on results) was found to be an obligatory move. The result reflects that the discussion section focuses on commenting on specific results. Move 2 (Reporting results) was considered quasi-obligatory in their study as it occurred in all discussion sections except one research article. Subsequent studies (e.g. Amnuai & Wannaruk, 2013; Wuttisrisiriporn, 2015; Nodoushan, 2012) also employed this two-level (moves and steps) analysis and yielded similar results.

We can see that the studies into the textual organization of research article discussion sections so far have been conducted on many disciplines and the results of the studies provide better understanding of how this section is constructed. However, as said in the introduction, this section still receives less attention compared with other sections of research articles. This section should thus be explored more. As second language writing has yielded some interesting characteristics in the previous study on introduction sections (Ozturk, 2007), and research article discussion sections in this discipline is still under researched, the present study will, therefore, investigate the textual organization of research article discussion sections in second language writing in order to find out how expert writers in this discipline prefer to organize their discussion.

Data and method of analysis

The corpus used in the present study comprised 103 research article discussion sections from five journals: 37 from *Journal of Second Language Writing*, 13 from *Assessing Writing*, 19 from *Journal of English for Academic Purposes*, 14 from *English for Specific Purposes* and 20 from *System*. These journals were selected because they are all established journals which regularly publish articles related to English language writing over a long period (more than ten years).

The corpus was restricted to empirical studies. The discussion sections were taken from research articles restricted to a period of five years (2011-2015). Each discussion section was about 500-2000 words in length. This range of words is derived from the inspection of the number of words in all discussion sections. It allowed the study to cover the majority of the data. The authors' native language was not taken as a variable in the present study; therefore, the discussion sections were collected from any articles regardless of the authors' native language. This study is interested only in English writing as a second language so articles which are on English for first language (L1) were not included in the study.

In order to analyse the data to study the textual organization of the research article discussion sections, a coding scheme was developed. A coding scheme was developed based on previous rhetorical studies on research article discussion sections (Belanger, 1982; Peng, 1987; Hopkins & Dudley-Evans, 1988; Swales, 1990, 2004; Holmes, 1997; Nwogu, 1997; Posteguillo, 1999; Yang & Allison, 2003). Moves and steps identification was a recursive practice. The data were analysed and reanalysed, and the operational criteria of each move and step were adjusted along the process of analysis until they were settled. The moves and steps identified in the corpus are shown below.

- Move 1: Providing Background information
- Move 2: Managing the section
- Move 3: Summarizing results
- Move 4: Reporting results
- Move 5: Commenting on results
 - Step 1: Interpreting results
 - Step 2: Comparing results with literature
 - Step 3: Accounting for results
 - Step 4: Judging results
- Move 6: Summarizing the study

- Move 7: Evaluating the study
 Step 1: Indicating limitations
 Step 2: Indicating significance/ advantage
 Step 3: Evaluating methodology
- Move 8: Deductions from the research
 Step 1: Making suggestions
 Step 2: Recommending further research
 Step 3: Drawing pedagogical implications

The analysis was first carried out by the researcher, and then 15 randomly selected pieces of data (around 15% of the corpus) were analysed and checked for coding agreement by an expert in move analysis and applied linguistics. The agreement rate of this data analysis was 94.68 per cent. The Kappa coefficient of the analysis was also calculated which was 0.94. The agreement rate and the kappa have shown that the demarcation of move boundaries between the two coders was reliable.

Results

Moves and steps used in the corpus

From Table 1, the analysis of the frequency of moves and steps revealed Move 5 (Commenting on results) occurred most frequently. Following the classification of this move by Kanoksilpatham (2005), it was considered an obligatory move as it occurred in all 103 discussion sections. Move 4 (Reporting results) was the second most frequent move. Since it appeared 95.15% of the corpus, which is more than 60%, it was thus classified as a conventional move for writing research article discussion sections in second language writing. Move 8 (Deductions from the research) and Move 1 (Providing background information) were also used frequently in the corpus. The former appeared in 73 discussion sections which was 70.87%. The latter appeared in 66 discussion sections which was 64.08%. They were both considered conventional moves for writing research article discussion section in second language writing.

Table 1 Overall Frequency of the Moves and Steps

| Moves & Steps | | Frequency of occurrence | | Percentage | |
|--|---------|-------------------------|----|------------|----|
| Move 1: Providing background information | | 66 | | 64.08 | |
| Move 2: Managing the section | | 17 | | 16.50 | |
| Move 3: Summarizing results | | 29 | | 28.16 | |
| Move 4: Reporting results | | 98 | | 95.15 | |
| | step 1: | 7 | 03 | 4.47 | 00 |

| | | | | | |
|--|---|---|----|------|------|
| ove 5: Commenting on results | Interpreting results | | | | |
| | tep 2: Comparing results with literature | 9 | | 6.41 | 8 |
| | tep 3: Accounting for results | 9 | | 6.41 | 8 |
| | tep 4: Judging results | 6 | | 4.66 | 4 |
| Move 6: Summarizing the study | | | 1 | | 0.97 |
| ove 7: Evaluating the study | tep 1: Indicating limitations | 7 | | 5.92 | 3 |
| | tep 2: Indicating significance/ advantage | 9 | 54 | 7.86 | 3 |
| | tep 3: Evaluating methodology | | | .74 | 8 |
| ove 8: Deductions from the research | tep 1: Making suggestions | 1 | | 9.81 | 3 |
| | tep 2: Recommending further research | 3 | 3 | 2.04 | 3 |
| | tep 3: Drawing pedagogical implications | 1 | | 9.81 | 3 |

The arrangement of moves in the corpus

The analysis of the arrangement of moves revealed that all moves could be used to open research article discussion sections in second language writing, except Move 6 (Summarizing the study) and Move 8 (Deductions from the research). However, Move 1 (Providing background information) was most frequently used to start the sections. It was used in 48 research article discussion sections. Move 1 appearing in this position was usually to provide background information of overall research such as aims and methodological information and restate all research questions, not mentioning only a particular research question like Move 1 which appeared in the body of the discussion.

For the closing move, the move which was most likely used to end the discussion sections was Move 8 (Deductions from the research). It was found in 52 cases in the corpus. Another move which was also often employed to close the sections was Move 5 (Commenting on results). It was found in 27 research article discussion sections. The moves that never worked as a closing move according to the corpus were Move 1, Move 2, and Move 6.

Regarding the move sequence, the analysis of the corpus revealed that there was no uniformity in the sequence of moves used in the corpus. The moves seemed to be able to appear in any parts of the discussion sections and in any sequence and form different patterns in all 103 pieces of data. Some moves were used only once in the section. These moves were Moves 2, 3 and 6. There were 5 moves that were used many times. These moves were Moves 1, 4, 5, 7 and 8.

Moves 1, 4, 5, 7 and 8 were arranged in various ways, and they tended to form a cycle. Although the moves were combined in different ways, it was found that there were some move sequences that were more common and used more frequently than others. These sequences were Move 4 → Move 5, Move 4 → Move 5 → Move 8, Move 1 → Move 4 → Move 5, and Move 7 → Move 8.

Move 4 followed by Move 5 was the sequence that occurred most frequently. This sequence was used repeatedly in a section. The writers reported the results of the study in Move 4, usually one specific result at a time, and commented on the result in Move 5. Each specific result could be followed by one or several comments. This extract taken from Kormos (2011, p. 156) illustrates how this sequence was used many times in the section.

As regards the effect of task demands on narrative performance, we can conclude that the need to conceptualize the story-line did not seem to result in major linguistic and cohesive changes. //Move 4// It can be argued that the lack of substantial difference between the two types of tasks is due to the fact that both tasks required learners to write in the same genre. Genre is one of the important factors that affects the use of cohesive devices in writing (Smith & Frawley, 1983), and it also influences the lexical and syntactic range of expression as well the use of connectives (for a review see Biber & Conrad, 2009). //Move 5// The results concerning accuracy and syntactic complexity indices reveal that at the upper-intermediate level, writers in this study did not avoid the use of complex syntactic structures and constructions that they had not yet fully mastered when given the opportunity to tailor a narrative text to match their own linguistic resources. //Move 4//

Therefore, it might be assumed that both types of tasks provide similar opportunities for learners to display their linguistic competence in writing. //Move 5//

Another arrangement of moves which appeared frequently was Move 4 followed by Move 5 and Move 8. The writers reported specific results, commented on them and then made deductions. The deduction made in this sequence was usually suggestions, recommendations on further studies or pedagogical implications made based on specific results or issues. An example of this sequence can be seen in the extract below (Fritz & Ruegg, 2013, p. 179).

Apart from lexical accuracy, lexical range is also explicitly mentioned in the rating scale. The results show, however, that the range of words used did not significantly affect the lexis scores. //Move 4// This means that, although raters were explicitly trained to evaluate essays on the range of lexis used, they did not follow the rating scale in this respect. Students, therefore, were given scores on their essays that did not inform them of characteristics which were supposed to be assessed by this writing task. //Move 5// This finding suggests possible implications for rater training, where spending more time attuning raters to particular aspects of the rating scale may increase the construct validity of the test. //Move 8//

Move 1 followed by Move 4 and then Move 5 is the sequence which was used almost as frequently as the previous sequence (Moves 4 – 5 – 8). The writers provided background information of the research, reported results and then commented on the results. If this sequence was at the beginning of the section, Move 1 was usually to provide background information of overall research such as aims, related literature, methodological information and all research questions. If this sequence appeared in other part of the section, Move 1 was likely to restate a particular research question, literature and methodological information related to specific questions or results. The extract below (Lindgren and Stevenson, 2013, p. 401) exemplifies a Moves 1 - 4 - 5 sequence.

This study has examined whether language and gender influence the expression of interactional meanings in the pen friend letters of young Swedish writers. It has also examined the textual resources that the young writers used to express interactional meanings in the letters written in the foreign language. //Move 1// The findings indicated that there were more commonalities than differences in the semantic expression of interactional meanings in the L1 and FL texts, and that gender appeared to have slightly more effect on this expression than did writing in a foreign language. The findings also indicated that the writers were able to express a range of meanings—sometimes sophisticated ones—in FL, using resources in their communicative repertoire creatively, albeit, as the examples showed, by no means always accurately. //Move 4// Similarly to other studies on young FL writers (e.g., Stevenson, Schoonen, & de Glopper, 2006; Silva, 1993), it was found that participants wrote significantly shorter texts in FL. At age 11, although these young writers can be said to be developing literacy in two languages, not surprisingly, there still appear to be considerable differences in their proficiency in L1 and FL writing. They are more fluent writers in Swedish than in English, and have a better command of the Swedish language system. //Move 5//

One more sequence of moves which was often found in the corpus was Move 7 followed by Move 8. The writers evaluated the study and provided deductions. Moves 7 and 8 occurring in this sequence were usually employed at the end of the section. There could be 1 – 4 cycles of these moves in a section. Unlike the deductions in the sequence of Moves 4 – 5 – 8 which were made based on specific results, the deductions made in the sequence of Moves 7 - 8 were based on overall research results or the points made in Move 7 (Evaluating the study). The extract below (Yasuda, 2015, p. 116) provides an example of the sequence of Moves 7 - 8.

Although the present study has yielded a number of significant implications concerning a link between writing-to-learn and learning-to-write, there are several limitations and new questions that can be derived from the findings. First, since this study focused only on the changes in the students' meaning-making choices within a semester-long course that incorporated summary writing into content-oriented reading, it is unclear whether the students maintained their genre knowledge and transferred it to their subsequent practices in real-life writing situations, which is of utmost importance in educational contexts. Unfortunately, delayed post-tests could not be administered due to institutional constraints. //Move 7// Hence, it would be informative if additional studies could focus on EFL writers for a longer period to explore if or how they transfer genre knowledge learned through instruction into actual practice. //Move 8//

Discussion

This study explored the textual organization of research article discussion sections in second language writing. Using move analysis, a corpus of 103 research article discussion sections was analysed to identify moves and steps used in the section. The findings reveal the structure of moves and steps and the characteristics of the research article discussion sections in this discipline.

The analysis of the frequency of the move occurrence revealed that Move 5 (Commenting on results move) was found in all 103 research article discussion sections. The number of the move occurrence indicates that the main function of the discussion section is to discuss or comment on the results. Move 5 was classified as an obligatory move. This means that this move is indispensable to writing the research article discussion section in second language writing. The result confirms the importance of this move as reported in previous studies (e.g. Yang & Allison, 2003; Amnuai & Wannaruk, 2013; Dobakhti, 2011).

Move 4 (Reporting results) was the second most frequent move in the corpus. It appeared in 98 research article discussions or 95.15% of the corpus. The high frequency of occurrence, which is close to that of Move 5, reflects how important this move is to the discussion sections. It is almost as important as Move 5. Besides, it also shows that writers in this discipline prefer to restate the findings although all the findings may have already been described in the Results section.

Move 4 was regarded as a conventional move. This finding contrasts with Hopkins and Dudley's study (1988) which reported the statement of results move as an obligatory move. This is probably due to the fact that these two studies looked at different fields of study. The previous

study looked at the discussion sections in MSc dissertations which is in the science field (Biology) while this current study looked at second language writing.

Another move whose function is also to restate the findings is Move 3 (Summarizing results). It appeared in 29 pieces of data or 28.16% of the corpus. The higher number of occurrence of Move 4 (Reporting results) over Move 3 (Summarizing results) suggests that writers in second language writing prefer to restate findings and deal with one finding at a time than summarizing the overall research results and discuss. The low frequency of occurrence of Move 3 is in line with the studies on the research article discussion sections in applied linguistics by Yang and Allison (2003) and Amnuai and Wannaruk (2013). The results are similar probably because second language writing is closely related to applied linguistics.

Move 8 (Deductions from the research) was the third most frequent move in the corpus. It was found in 73 discussion sections or 70.87% of the corpus. It was regarded as a conventional move. This finding suggests that Move 8 is quite a prominent move in writing the research article discussion sections in second language writing. Although the main function of the discussion section is to report and discuss results, making deductions is also important. This is because highlighting the contributions and implications of a particular result or the overall study is like a promotional act. The writers need to present how valuable their study is to the field by stating the knowledge derived from the study, areas for future research and implications to teaching and learning to promote their work in order to get attention from readers.

Move 8 is realized by 3 steps: Making suggestions, Recommending further research and Drawing pedagogical implications. Step 1 and Step 3 were used more frequently than Step 2. They both occurred in 41 research article discussion sections or 39.81%. Step 2 was the least frequent. This finding on Move 8 Step 2 with the lowest frequency is not in line with Yang and Allison (2003) and Amnuai and Wannaruk (2013). In their studies, it was Step 2 which was most frequently employed. The corpora used in these studies may account for the inconsistency of the findings. The studies of Yang and Allison and Amnuai and Wannaruk both looked at the research article discussion sections in applied linguistics. In contrast, the current study focuses only on the research article discussion sections in second language writing. Although these two disciplines are closely related as second language writing is sometimes categorized as a branch of applied linguistics, the preference for certain moves and steps may be different. This confirms previous studies (e.g. Kanoksilapatham, 2015; Ozturk, 2007; Maswana, Kanamaru & Jajino, 2015; Suntara & Usaha, 2013) which also found some differences when studying research articles in the disciplines that are closely related. However, this is just a possible explanation. More research and evidence are needed to confirm the preference of the writers in second language writing for using Step 1 and Step 3 to make deductions in the discussion sections and to confirm whether such trend can be used to distinguish the move and steps used in the research article discussion sections of second language writing.

Move 2 (Managing the section) is the move that has never been reported before in previous studies. Move 2 was employed by the writers to announce how the whole section of the discussion section or some part of the section would be constructed. It was used to inform the readers explicitly how the writers arranged the order of the content, and how the content or argument in

the section was developed. It was also used by the writers to inform the readers the scope or the focus of the content in the discussion section. Even though the move was found in this corpus, it occurred only in 17 research article discussion sections (16.50%). This move is actually similar to Move 3 Step 1 (Announcing present research descriptively and/or purposively) in the revised CARS model for introduction sections (Swales, 2004). The location of the discussion section may contribute to the rare occurrence of Move 2. Since the discussion section appears at the end of the research article, it is less necessary for the writers to provide the outline of the following information.

The low occurrence of Move 2 may also concern the length of texts. Giving previews, reviews and overviews to help the reader understand the structure and arguments is recommended in lengthy texts like a thesis (Patridge & Starfield, 2007). Therefore, this feature of writer responsible language seems to be more common in a thesis which is very long involving many sections and chapters. However, the discussion sections in research articles are usually around 1 paragraph to 3 pages. The writers may find that giving previews or telling what the section will be about and how it will be organized is less necessary.

Despite the low frequency of Move 2, the appearance of this move in the corpus has implied a possible strategy that the writers in second language writing may use to handle the complexity of the content and organization of the discussion sections to make them easy for the readers to read and follow.

Regarding the opening moves, the finding obtained from the analysis is consistent with Holmes (1997, 2001) and Dobakhti (2011). The finding indicates that two moves which most frequently appeared at the beginning of the section are Move 1 (Providing background information) and Move 4 (Reporting results). Despite the similarity of the finding, the preference for the two opening moves between the current study and the previous ones is different. In Holmes (1997), the statement of result move was found to be more preferable than the background information move while in the current study, the providing background information was used more frequently than the reporting results move. This finding reveals how the writers in second language writing prefer to open the discussion sections in research articles. They prefer to restate the research aims, research questions, methodology and some important literature than to immediately jump to reporting results. However, it is also common for the writers to start their discussion with research results. This preference reflects an awareness that reviewing the main points of the research will facilitate readers' understanding of the discussion and argument. It is also helpful for busy readers who do not have time to read the whole article but want to focus on only important parts of the article.

The finding about closing moves is also in line with Holmes (1997). The move that appeared most often at the end of the section in the current study is Move 8 (Deductions from the research) which is comparable to Move 7 (Recommendation) in Holmes' research. The move that never made any appearance as a closing move is also the same. It is Move 1 for both studies, which is to provide background information of the study.

The results regarding the move patterns are also in line with previous studies (e.g. Holmes, 1997, 2001; Yang & Allison, 2003; Kanoksilapatham, 2005; Dobokhti, 2011). The analysis of the corpus in the present study reveals that the organization of the research article discussion sections in second language writing is not linear but cyclical, which means that the discussion sections consist of many cycles of moves. This is because of the reoccurrence of certain moves. As reported in the previous section, the moves that tend to appear many times in the sections are Moves 1, 3, 5, 7 and 8.

It was also hard to find patterns of the moves since there was no regularity in the move appearance. However, some typical patterns could still be identified despite the low degree of predictability of the move occurrence in the discussion sections. These patterns are Move 4 → Move 5, Move 4 → Move 5 → Move 8, Move 1 → Move 4 → Move 5 and Move 7 → Move 8.

Move 4 → Move 5 was the most common sequence in the corpus. These two moves also occurred most frequently in the corpus. This finding confirms previous studies (e.g. Kanoksilapatham, 2005) that research article discussion sections are built on 2 moves which are reporting results and commenting. The finding regarding the sequences of Move 4 followed by Move 5 and Move 1 followed by Move 4 and then Move 5 are also consistent with Holmes (1997, p. 331) who found that “the appearance of Statement of result or Background information followed by Generalization or Reference to previous research” was typical in his study.

Move 4 → Move 5 → Move 8 was the second most frequent pattern. This pattern is similar to the pattern found in Dobokhti (2011) who also found Move 8 (Deductions from the research) following Move 4 (Commenting on results). This pattern could be found at the beginning, in the middle and at the end of the section. This finding suggests that the writers prefer both making deductions based on specific results by providing suggestions, recommending further research and providing pedagogical implications right after the issues raised from a particular finding and making deductions based on overall research.

One more move pattern that shows regularity of occurrence is Move 7 → Move 8. This is when the writers evaluate the study and then make deductions. An investigation into this pattern of moves reveals an interesting arrangement of steps. It was found that in the Move 7 → Move 8 pattern, Move 7 Step 1 which is to indicate the limitations of the study was employed most frequently, and this step was usually followed by Move 8 Step 3 which is to recommend further research. This arrangement of steps shows how the writers in second language writing make use of the limitations of their research. They use the limitations in their research to identify areas or topics for further research. The extract taken from Gennaro (2013, p. 167) exemplifies the occurrence of Move 8 Step 3 after Move 7 Step 1. In the extract, after the writer describes how one writing sample is unable to reveal the learners’ knowledge in a variety of genre, she suggests what could be done in the future studies based on the stated limitation.

Interpretations of the results brought to light a few limitations of the current study. For one, participants were evaluated by only one writing sample, limiting their ability to reveal strengths and weaknesses that might exist through a variety of genres. // Move 7 – Step 1// Given learners’ different educational backgrounds, it is possible that the two groups would

perform differently across genres and tasks requiring different degrees of control in the five writing components examined. Future research could include learners' responses to multiple writing tasks. Also related to learners' backgrounds is the possibility that socioeconomic variables other than learners' high school backgrounds and duration of US residency contributed to the differences found across the two groups. Future research could address this question by examining additional personal attributes of the learners in each group. //Move 8 – Step 3//

This finding, thus, suggests one of the strategies that the writers in second language writing use to identify areas for future studies, which is to identify them based on the research limitations. This strategy is useful for less experienced writers, and it should benefit not only those in second language writing, but it should be applicable to all fields.

Conclusion

This research investigates the textual organization of research article discussion sections in second language writing in order to reveal how expert writers in the discipline construct their discussion. Consistent with previous studies, the analysis of the corpus indicates that the discussion sections in second language writing were used to report and comment on results. Apart from this main function, the sections were also used to discuss the knowledge derived from the study, applications of the research results and chances for future studies.

The findings of this study have some implications for the teaching in English for Academic Purposes and English for Specific Purposes. Teachers can use the findings as a guideline for them to design their academic writing course, write materials and design lessons. The findings could provide them with some directions of how and what to teach their students when it comes to writing research articles, especially the discussion sections. For example, as found in the study, the managing the section move was used to announce the outline or content of the discussion sections. This suggests one of the issues that could be included in the lesson. Strategies and language that are useful for handling complexity of the discussion section to make it friendly to the readers could be taught to the learners.

In addition, the findings of the study could be of value to academics and graduate students who are writing for publication. The findings have reflected the convention and expectation regarding the content and organization of texts in the research article discussion sections in second language writing. Academics and graduate students can follow and write their research papers accordingly in order to fit in the discourse community and thus may successfully get their papers published.

This study has given valuable insight into the move analysis of research articles, and provided better understanding of the how expert writers in second language writing construct their discussion in research articles. However, as the aim of the present study is to explore the overall or macro structure of the discussion sections, the results are limited the organization of moves. For future studies, the linguistic features should also be studied in order to find out about the language that the expert writers in second language writing use to achieve each move and step, which can provide language guidance for the less experienced writers.

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