

An Analysis of Move Patterns in Abstracts of Social Sciences Research Articles

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ABSTRACT

A rhetorical segment in traditional abstract displaying a sign of particular function is frequently referred to as a move. One of the most common moves is the *Background, Aim, Method, Results, and Conclusion* (BAMRC). The objective of this paper is to investigate the move patterns of research article abstracts in the field of social sciences based on BAMRC moves. Using the Scopus bibliographic database, a total of 467 abstracts from 298 research journals in the field of social sciences were analyzed. The result showed a wide range of move patterns. The implication of the result of this study suggests the existing traditional abstracts in social sciences might not be sufficiently “informative” due to missing moves and due to various move orders. To this end, automatically mapping moves in traditional abstracts to sub-headings in structured abstracts can be a more challenging task, requiring additional procedures to resolve these types of compatibility issues. Future studies can compare this study’s result to other fields or disciplines within social sciences in order to find a more precise nature of abstracts in the field of social sciences.

Keywords: Structured abstracts, Moves, Informative abstracts, Traditional abstracts

초 록

문장이나 문단 내에서 특정 기능을 하는 표현을 이동마디라고 하며, 여러 이동마디는 논문의 초록에서 쉽게 발견된다. 대부분의 이동마디는 보편적으로 배경-목표-방법-결과-결론(이하 BAMRC)의 순서로 많이 사용한다. 이 논문은 이러한 BAMRC 이동마디에 기초하여 사회과학분야의 논문 초록 중에서 나타나는 일정한 패턴을 분석 하여 연구한 것이다. 기존 연구와 달리 이 연구에 사용된 데이터베이스는 Scopus로 사회과학분야의 학술지 298개에서 467편의 초록을 샘플로 삼아 막대한 데이터를 사용하였다. 분석 결과 이동마디가 넓은 범위에서 패턴을 나타내므로 결국 논문 초록에서 논문에 대한 정보를 얻는데 한계가 있는 것을 알 수 있다. 이 연구 결과, 기존에 있는 전통적인 사회과학 논문초록은 결국 이동마디가 없거나 다양한 이동마디의 패턴이 있어, 결국 논문초록 내에서 충분한 정보가 제공되지 않는다는 것을 보여준다. 따라서 기존 서술형식의 초록에 있는 이동마디들을 일정 양식을 따르는 초록으로 자동적으로 옮기는 것은 적합하지 않는 방법이며, 이러한 작업은 확인 절차를 밟을 것이 요구되므로 어려운 작업일 수 밖에 없다. 이 연구 결과를 토대로 추후에 진행되는 연구에서는 사회과학분야 논문 초록의 본질을 보다 구체적이고 정확하게 알아내기 위하여 사회과학 외의 다른 분야와도 비교하는 것이 도움이 될 것이다.

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I . Introduction

An analysis of abstracts in a given genre can be useful in understanding their nature and the way authors prefer to include information in them. Finding structural patterns in collected abstracts can indicate a particular functional type of information that is expected in a typical abstract in a given domain or field. A commonly used method to analyze abstracts is the move analysis. Here, a ‘move’ refers to segments of text that display a particular function.¹⁾ Typical moves in an abstract are *Background, Aim, Method, Results, and Conclusion* (BAMRC).

In general, two distinctive forms of abstracts are used in academia. One is the traditional abstract and the other is the structured abstract. The major difference between the traditional abstract and the structured abstract is their typographical layout.²⁾³⁾ A traditional abstract gives authors the flexibility and liberty of writing in a single paragraph form; whereas in a structured abstract, authors need to write an abstract in a confined manner, in which the author writes information under sub-headings. Analyzing with the use of moves patterns is mainly applicable to traditional abstracts since moves in structured abstracts are already divided into sub-headings.

Compared to the traditional abstract, the overall argument for having a structured abstract is that it is more ‘informative’. The particular benefits of structured abstracts were investigated by Sharma and Harrison⁴⁾ who concentrated their study to the medical field. As they pointed out, in a structured abstract, with the use of the sub-headings, the needed information can be scanned faster than in traditional abstracts. Arguably, this benefit is important in choosing which type of abstract to adhere to. In the field of social sciences, however, structured abstracts have not been adopted widely due to the divergent writing styles of authors.

For the field of social sciences, an informative abstract, whether structured or traditional, should contain information related to BAMRC categories. The BAMRC categories were supported

1) John M. Swales and Christine B. Feak, *Abstracts and the Writing of Abstracts*, The University Press, 2009.

2) James Hartley, “Typographic Settings for Structured Abstracts,” *Journal of Technical Writing and Communication*, Vol.30(2000), pp.355-365.

3) Clarann Weinert, “Are All Abstracts Created Equal?” *Applied Nursing Research*, pp.106-109, 2008.

4) Sandeep Sharma and Jayne E. Harrison, “Structured Abstracts: Do They Improve the Quality of Information in Abstracts?” *American Journal of Orthodontics and Dentofacial Orthopedics*, Vol.130, No.4(2006), pp.523-530.

by a number of previous analyses including those of Hartley⁵⁾ and Zhang and Liu.⁶⁾ Unlike in structured abstracts, moves in traditional abstracts are implicit and traditional abstracts adhere to a narrative structure rather than following sub-heading formats.

Moreover, Hartley and Betts⁷⁾ have argued that structured abstracts should be adopted for the social sciences due to the limitations of traditional abstracts. The result of their study is that more in-depth analysis of traditional abstracts needs to be conducted in the field of social sciences. One of the differences between a traditional abstract and a structured abstract is the individual functional unit within an abstract. This functional unit can be best defined as the notion of moves, which was first provided by Swales and Feak.⁸⁾

In general, traditional abstracts in the social sciences generally contain a mixture of informative or indicative abstracts. Each type of abstract has been widely discussed in literature.⁹⁾¹⁰⁾ An indicative abstract is a type of abstract that mainly indicates the type of information that can be expected from an article. On the other hand, an informative abstract is a type of abstract that contains all major components of a paper and can be considered as a micro version of a full paper. Orasan¹¹⁾ suggests that an informative abstract is more substantial than an indicative abstract in terms of providing needed information to readers. Additionally, Ren and Li¹²⁾ have noted that emphasis on the informative function of abstracts is probably appropriate due to the

5) James Hartley, "Current Findings from Research on Structured Abstracts," *Journal of the Medical Library Association*, Vol.92(2004), pp.368-371.

6) Chunfang Zhang and Xueli Liu, "Review of James Hartley's Research on Structured Abstracts," *Journal of Information Science*, Vol.37, No.6(2011), pp.570-576.

7) James Hartley and Lucy Betts, "Common Weaknesses in Traditional Abstracts in the Social Sciences," *Journal of the American Society for Information Science and Technology*, Vol.60, No.10(2009), pp.2010-2018.

8) John M. Swales and Christine B. Feak, *Abstracts and the Writing of Abstracts*, The University Press, 2009.

9) F. W. Lancaster, *Indexing and Abstracting in Theory and Practice*. 3rd ed. Champaign, IL: University of Illinois, Graduate School of Library and Information Science, 2003.

10) Donald Cleveland and Ana B. Cleveland, *Introduction To Indexing And Abstracting*, 4th ed., Libraries Unlimited, 2013.

11) Constantin Orasan, "Patterns in Scientific Abstracts," *Proceedings of Corpus Linguistics*, pp.443-405, 2001.

12) Hongwei Ren and Yuying Li, "A Comparison Study on the Rhetorical Moves of Abstracts in Published Research Articles and Master's Foreign-Language Theses," *English Language Teaching* Vol.4, No.1(2011), pp.162-166.

vast quantity of abstracts that are available. Considering the fact that abstracts in social sciences are likely to be mixed, investigating the extent of the information included in an abstract is helpful to understanding of the nature of traditional abstracts. By analyzing traditional abstract moves, this study intends to uncover the informative degree that a social science abstract provides in its entirety. To a certain extent, having common moves in abstract, such as the BAMRC, demonstrates that it is fully informative.

A straight forward approach to generate an abstract in another form is by mapping the moves in traditional abstracts and turning them in sub-headings in a structured abstract. In this approach, an informative abstract could be more easily mapped into structured abstracts either by some type of machine processing or by a manual processing. Although many have overlooked the benefits of reproducing an abstract in another form, transforming a traditional form to a structured form can be desirable since it would allow a user to view selected moves for even more concise information at a glance. In particular, in an online environment, viewing only selected components of abstracts allows a quicker and a more flexible scanning through retrieved reference materials. For example, a user might want to view sentences related to the results of the research, instead of viewing entire abstracts.

With this ultimate goal in mind, this study is going to examine move patterns of traditional abstract based in the field of social sciences. In particular, the order of moves and distribution of moves will be examined extensively. Furthermore, the objective of this study is to examine whether move analysis can uncover the capability issues between traditional abstracts and structural abstracts.

This study intends to make a contribution with regards to understanding the structural characteristics of abstracts. Compared to previous studies on abstracts, this study conducted a move analysis based on a relatively large sample size. The majority of previous studies relied upon relatively small samples consisting less than 100 abstracts. Unlike other studies, in this study, a wide range of journals from the field of social sciences was selected while other similar studies focused on only on small quantity of journals. Generally, a larger sample size of data is more effective for an in-depth analysis of move patterns. This study intends to serve as a milestone for future studies that intend to conduct a similar research. Moreover, future studies could use the present study as a reference point within the field of social sciences or other fields.

II . Related Studies

One of the criteria of measuring well-written abstracts is the ability of researchers to speedily determine the articles' relevancy for the information they need. From this point of view, various efforts have been made to improve the overall qualities of abstracts.¹³⁾¹⁴⁾¹⁵⁾A number of studies were conducted in order to examine the appropriateness of structured abstracts. More specifically, Sollaci and Pereira¹⁶⁾ examined the use of Introduction, Methods, Results and Discussion (IMRAD) as a structured abstract format whereas Sharma and Harrison¹⁷⁾ suggested the *Objectives, Design, Setting, Subjects, Interventions, Results, and Conclusions* as a structured abstract category both for the fields of medical sciences.

A number of previous studies have used MEDLINE (<http://www.ncbi.nlm.nih.gov/pubmed>), a bibliographic database for the medical domain, as a dataset for investigating the applicability of machine learning techniques. Agarwal and Yu¹⁸⁾ suggested an approach for automatically classifying sentences in MEDLINE abstracts into IMRAD categories. Similarly, Kellera and Grabar¹⁹⁾ suggested the possibility of systematically structuring MEDLINE abstracts by using a machine learning technique.

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- 13) James Hartley, "Improving the Clarity of Journal Abstracts in Psychology: The Case for Structure," *Science Communication*, Vol.24(2003), pp.366-379.
 - 14) James Hartley and Lucy Betts, "Common Weaknesses in Traditional Abstracts in the Social Sciences," *Journal of the American Society for Information Science and Technology*, Vol.60, No.10(2009), pp.2010-2018.
 - 15) Michela Montesi and Blanca Gil Urdiciain, "Abstracts: Problems Classified from the User Perspective," *Journal of Information Science*, Vol.31, No.6 (2005), pp.515-526.
 - 16) Luciana B. Sollaci and Mauricio G. Pereira, "The Introduction, Methods, Results, and Discussion (IMRAD) Structure: A Fifty-Year Survey," *Journal of Medical Library Association*. Vol.92, No.3(2004), pp.364-367.
 - 17) Sandeep Sharma and Jayne E. Harrison, "Structured Abstracts: Do They Improve the Quality of Information in Abstracts?" *American Journal of Orthodontics and Dentofacial Orthopedics*, Vol.130, No.4(2006), pp.523-530.
 - 18) Shashank Agarwal and Yu Hong, "Automatically Classifying Sentences In Full-Text Biomedical Articles into Introduction, Methods, Results, and Discussion," *Bioinformatics*, Vol.25, No.23(2009), pp.3174-3180.
 - 19) Mikaela Kellera and Natalia Grabar, "Towards a Systematic Structuring of MEDLINE Abstracts," *24th International Conference of the European Federation for Medical Informatics. Quality of Life through Quality of Information* – J. Mantas et al. (Eds.), 2012.

Attempts to promote the use of structured abstracts have been made by a number of researchers. For example, Zhang²⁰⁾ and Hartley²¹⁾ supported the idea of having a minimum of five sub-headings: *Background, Aim, Methods, Results and Discussion, and Conclusion*. Furthermore, Budgen et al.²²⁾ suggested that structured abstracts should be adopted in the field of software engineering. They argued that, overall, structured abstracts are beneficial in terms of increasing clarity and completeness. For their study, they used the BAMRC moves.

Other studies examined the basic differences between moves in traditional abstracts and sub-headings of structured abstracts. In the field of library sciences, Khasseh and Biranvand²³⁾ investigated the difference of the two based on the five moves:

1. Problems/purpose/objective/research question/focus of study
2. Sample/population size/characteristics
3. Method (e.g., data collection procedures, intervention, research design)
4. Findings
5. Conclusions/implications/recommendations

In traditional abstracts, Khasseh and Biranvand²⁴⁾ have reported that 99.59% of instances were found for the move #1 while only 53.88% of instances for the move #5. Their research suggested that most authors placed the ‘Problems/purpose/objective/research question/focus of study’ as the most important component of an abstract. Yet, most authors placed less importance on inserting statements about ‘Conclusions/implications/recommendations’ into the abstract. The authors pointed out that the frequency of missing information and mismatch between two forms of abstracts is likely to arise.

20) Chunfang Zhang and Xueli Liu, “Review of James Hartley’s Research on Structured Abstracts,” *Journal of Information Science*, Vol.37, No.6(2011), pp.570-576.

21) James Hartley, “Current Findings from Research on Structured Abstracts,” *Journal of the Medical Library Association*, Vol.92(2004), pp.368-371.

22) David Budgen, Barbara Kitchenham, Stuart Charters, Mark Turner, Pearl Brereton and Stephen Linkman, “Preliminary Results of a Study of the Completeness and Clarity of Structured Abstracts,” *11th International Conference on Evaluation and Assessment in Software Engineering (EASE)*, Keele University, UK, 2007.

23) Ali Akbar Khasseh and Ali Biranvand, “Structured vs. Unstructured Abstract: A Different Look at Iranian Journals of Library Science,” *International Research Journal of Applied and Basic Sciences*, Vol.4, No.7(2013), pp.1706-1709.

24) *Ibid.*

There has been a number of studies that analyzed moves in fields other than social sciences. Hyland²⁵⁾ has suggested that there is an increasing trend of the appearance of *Introduction and Conclusion* moves in abstracts pertaining to the field of applied linguistics. Hartley²⁶⁾ has suggested that an *Introduction* move is similar to a *Background* move. A recent study conducted by Doro²⁷⁾ found a few differences between abstracts in linguistics and abstracts in English literature. Doro's²⁸⁾ study seems to suggest that there could be a universal move pattern containing similarities and differences among disciplines. Consequently, all these results contribute to the understanding of the characteristics of moves.

Pertaining to the field of social sciences, Kafes²⁹⁾ investigated move patterns by examining 138 research article abstracts from the online journal called *Social Behavior and Personality*. The author has reported that move #2 (Purpose), move #3 (Method), and move #4 (Results) were predominately present in all of the abstracts that he examined. Despite the fact that Kafes'³⁰⁾ study was based on only one journal publication, his work provides some insight into the move patterns in the social sciences abstracts.

However, there has been a lack of research that focuses on examining research article abstracts in the field of social sciences. An in-depth investigation of move patterns based on a variety of journal abstracts in the field could perhaps point to fundamental differences between the traditional abstract and the structured abstract. Such a finding could further support the weaknesses of the traditional form of abstracts as Hartley and Betts³¹⁾ argued.

Also, as previous research suggests, analyzing move patterns can be an effective method for

25) Ken Hyland, *Disciplinary Discourses: Social Interactions in Academic Writing*. Ann Arbor: University of Michigan Press, 2004.

26) James Hartley, "Current Findings from Research on Structured Abstracts," *Journal of the Medical Library Association*, Vol.92(2004), pp.368-371.

27) Katalin Doró, "Verb Tenses And Hedging in Published and Unpublished Applied Linguistics Research Paper Abstracts," *Studies in Honour of Marianne Nikolov*, pp.356, 2014.

28) *Ibid.*

29) Huseyin Kafes, "Cultural Traces on the Rhetorical Organization of Research Article Abstracts," *International Journal on New Trends in Education & their Implications (IJONTE)*, Vol.3, No.20(2012).

30) *Ibid.*

31) James Hartley and Lucy Betts, "Common Weaknesses in Traditional Abstracts in the Social Sciences," *Journal of the American Society for Information Science and Technology*, Vol.60, No.10(2009), pp.2010-2018.

understanding the underlying characteristics of abstracts in a particular field. For instance, Tseng³²⁾ applied move analysis to make a comparison between native and nonnative speakers of English in applied linguistics journals.

III. Methodology

To conduct the present study, bibliographic citation database from the Scopus website (<http://www.sciencedirect.com>) was used. The search was placed with the keyword “attitude” to constraint the retrievable pool. As a result, a total of 467 research article abstracts from 298 journals in the field of social sciences were downloaded in a plain text file. These journals were published from 2012 until March, 2014.

A preprocessing step was undertaken in order to remove irrelevant tags from the datasets. Then, each sentence was manually tagged with a type of move. The details of labeling scheme are being discussed in the following section. To calculate the distribution of sentences in each move, all abstracts had to be segmented into sentences. A number of customized UNIX shell scripts were written to segment the abstract.

Using BAMRC moves, this study aimed to investigate the move patterns by observing the following:

- the degree of having all five BAMRC moves,
- the move orders, and
- the distributional characteristics of sentences within each move.

To reduce ambiguity, descriptions of each of BAMRC move are provided. *Background* is a category that provides appropriate background information. *Aim* is a category that provides what the study intends to achieve in the author’s work. *Method* provides information that is associated with methodological steps and issues. *Results* is a category that provides the results or findings of the study. *Conclusion* is a category that provides the significance of the results in a more general framework.

32) Fan-ping Tseng, “Analyses of Move Structure and Verb Tense of Research Article Abstracts in Applied Linguistics Journals,” *International journal of English linguistics*, Vol.1, No.2(2011).

During the process of tagging sentences, linguistic indicators were noted as they aided in accurately defining each move. They were also useful from the standpoint of classifying the sentences of traditional abstracts. Table 1 shows an example of common linguistic indicators identified for each move. In spite of common noticeable linguistic indicators, for this study, a comprehensive list of linguistic indicators for each move was not pursued as it was not a feasible option. Various inflected terms of linguistic indicators could be considered although not shown in the table. Sentences that do not belong to the above categories were grouped as the *Undefined* category. To a certain extent, the *Undefined* category reflects the potential ambiguity and the difficulty associated with classifying the sentences into one of the BAMRC moves.

<Tab. 1> Linguistic Indicators for Moves

Compositional Categories	Linguistic Indicators
Background	Introduction, context, focus of study, research questions
Aim	Objective, purpose
Methodology	Setting, measurement, design of study, gap, sample, population
Results	Outcome, discussion, interpretation
Conclusion	Recommendation, implication, suggestion

A wide array of traditional journal abstracts was considered for the purpose of this study altogether. A partial listing of journals that have been used is shown in the Appendix. Table 2 shows the basic statistics of the dataset that were used for this study. Out of 467 journal abstracts that were examined in total, 415 were traditional abstracts and 52 were structured abstracts. Since this study critically examined only traditional abstracts, the 52 structured abstracts were discarded from the dataset. The traditional abstracts were from 298 different types of journals. The largest amount of abstracts from a single journal were from a journal called *Violence and Victims*; those were 12 in total.

<Tab. 2> Descriptive Statistics of the Dataset

Criteria	Amount
Total # of abstracts	467
Total # of journals	298
Total # of traditional abstracts	415
Total # of structured abstracts	52
Lowest amount of abstracts from single journal	1
Highest amount of abstracts from single journal	12

IV. Labeling Sentences with Moves

For the purpose of critically analyzing moves, the qualitative experience in labeling sentences needs to be mentioned first. Initially, the following labeling scheme was used to examine the overall distribution of categories. Each sentence was tagged with move by placing numeric values in front of each sentence. For example, a move number 1 was tagged as <1>. Thus, for each move the following tagging scheme is being used:

- <1> for *Background*,
- <2> for *Aim*,
- <3> for *Method*,
- <4> for *Results*,
- <5> for *Conclusion*, and
- <6> for *Undefined*.

There were instances where categorizing a sentence based on a given set of moves lacked any clear indication. For these types of instances, the *Undefined* category was added to the move list. The *Undefined* category <6> is being used in order to categorize sentences that do not fall into one of BAMRC moves neatly. Figure 1 shows an example of an abstract after the numbering scheme. As shown in this figure, in a traditional abstract, it was not unusual to see one or more BAMRC moves missing in traditional abstracts.

Occasionally, one sentence indicated two moves. In fact, a move can vary in length, ranging from a phrase to multiple sentences as Swales and Feak³³⁾ have pointed out. An underscore was used for sentences that reflected two moves. For example, for the following sentence, move <2_3> was used: “The aim of this study was to examine the associations between specific indicators in children’s family drawings, their body perceptions and eating attitudes among 192 Israeli children (M= 9.14)” Goldner, L. and Levi, M.³⁴⁾ In other cases, a move spanned over to several sentences.

33) John M. Swales and Christine B. Feak, *Abstracts and the Writing of Abstracts*, The University Press, 2009.

34) Limor Goldner, “Children's Family Drawings, Body Perceptions, and Eating Attitudes: The Moderating Role of Gender,” *The Arts in Psychotherapy*. Vol.41, No.1(2014), pp.79-88.

<2> The purpose of this study was to identify how pre-service teachers' self-efficacy beliefs for technology integration (SETI) can be improved during the coursework intervention, and which of the course factors (instructional media development skills, knowledge on technology, and lesson planning practice) has the highest impact on the SETI. <2> This research also attempted to explore a more inclusive path of the direct and indirect influences between SETI and other non-course variables (computer use, teachers' attitude towards computers (TAC), changes in TAC). <3> A total of 136 undergraduate students at a teacher education university in Korea participated in the study. <4> Our data analyses illustrated significant increase of prospective teachers' SETI after their completion of education technology course resulting mostly from lesson planning practice. <4> The hierarchical multiple regression revealed that the pre-service teachers with higher positive attitudes toward computers and greater ability for lesson planning showed higher increase in their levels of SETI. <4> The path analysis indicated that these two factors influenced the SETI directly, rather than indirectly. <4> Lesson planning practice did not affect pre-service teachers' attitudinal growth. <5> Implications on effectiveness of the lesson planning and attitudinal factors on SETI, and suggestions for teacher education course design are discussed.

Youngju Lee and Jihyun Lee, "Enhancing pre-service teachers' self-efficacy beliefs for technology integration through lesson planning practice," *Comput. Education*, 73(April, 2014), pp.121-128.

<Fig. 1> Tagging Sentences Based on Moves

The BAMRC move order played a role in determining the move type of sentences since it was selected as a move order that is most likely to be found in the dataset. Moreover, as Swales and Feak³⁵⁾ have noted, moves in the opening and closing of parts of abstracts were more general than the inner parts of the abstracts. This was taken into account in categorizing sentences into the BAMRC moves. In addition, the location of the sentence played a major role in identifying the move type. For instance, "This study examines ..." was treated as the objective of study in most cases if it appeared in the opening part of the abstract. The tagging was placed for analysis regardless of whether the sentences followed the BAMRC move order or not.

Often linguistic indicators became a contributing factor in determining the move. The linguistic indicator such as 'purpose of study' provides a strong clue in identifying the move type. By

35) John M. Swales and Christine B. Feak, *Abstracts and the Writing of Abstracts*, The University Press, 2009.

classifying one sentence with certainty, it aids in classifying the subsequent sentences since most sentences are expected to be in the progressive order. The subsequence sentence which starts with “*This research also attempted to explore a more inclusive path ...*” shows a weak sense of linguistic indicator. Yet it is placed immediately after the sentence that has a strong linguistic indicator. It is reasonable to categorize the next sentence which begins with “A total of 136 undergraduate students” into the *Methods* move. This classification also aids in classifying the previous sentence “*This research also attempted to explore a more inclusive path ...*” Because it is placed between two sentences, the move of this particular sentence can be more easily determined. The most likely move in this case is $\langle \rangle$, which is the *Objective*.

Often it was more difficult to determine the move when the order of moves was not in progressive order or when a sentence did not contain a clear linguistic indicator. The reason sentences were tagged as the *Undefined* category was because they did not contain a clear linguistic indicator. For these types of cases, abstracts were not considered as informative. In some cases, the quality of abstracts could be questioned if substantial move types were not clearly present.

V. Overall Move Distribution

A distribution of moves can indicate the degree in which all five BAMRC moves are present in social sciences abstracts. Using this, characteristics of abstracts in the field of social science can be obtained. Based on moves, frequency counts could be performed according to the abstracts and according to the sentences. Figure 2 shows the overall move distribution for the dataset. The left side (a) shows the frequency count of abstracts based on moves while the right side (b) shows the frequency count of sentences according to moves. Collectively, they represent the move distribution in a dataset.

The frequency count of abstracts according to moves suggests that, as a whole, all moves were important structural components of traditional abstracts. Figure (a) shows that 335 (81%) of abstracts contained some type of results. Thus, the *Result* category was present in the majority of the abstracts. The figure also shows that 326 (79%) abstracts contain the *Aim* category, 260 (62%) abstracts contain the *Methodology* category and 273 (66%) abstracts contain the *Background* category. The figure shows that only 180 (43%) abstracts contain information about

the *Conclusion*. Though the result is not conclusive, in effect, it could be argued that most authors do not consider the conclusion as the obligatory component in a traditional abstract. However, the results are similar to a study done by Khasseh and Biranvand³⁶⁾ in which the authors reported that the *Conclusion* move was the most common missing move in traditional abstracts.

Compared to a frequency count of abstracts based on moves, a different result was obtained when a frequency count of sentences was performed. The results indicate that the amount of sentences in some moves were considerably larger than others. For example, the figure shows that there is a substantial sentence difference between the *Results* and the *Aim*. As shown in Figure 2 (b), 805 (31%) sentences were tagged as the *Results*, while only 461 (18%) sentences were found in the *Aim*. Hence, the result of this study reveals that authors use fewer sentences for the *Aim* move than others.

Comparing both (a) and (b) in Figure 2, a greater number of sentences showed in the *Results* as compared to the number of sentences in other move types, but the number of abstracts that contained the *Results* was not considerably higher than other moves. Also, the Figure 2(b) shows that, for *Aim*, a noticeable lesser amount of sentences was present despite the fact that *Aim* was the second common moves in a traditional abstract. In Figure 2(a), a number of abstracts in *Aim* were not less than other moves. Montessi and Urdiciain³⁷⁾ stated that common problems associated with abstracts include ‘over-condensation’ and ‘lack or excess of information’. Detecting such problems could become possible by comparing the sentences in a move to the expected amount of sentences. As shown in the figure, an insignificant number of abstracts and sentences were associated with the *Undefined* move.

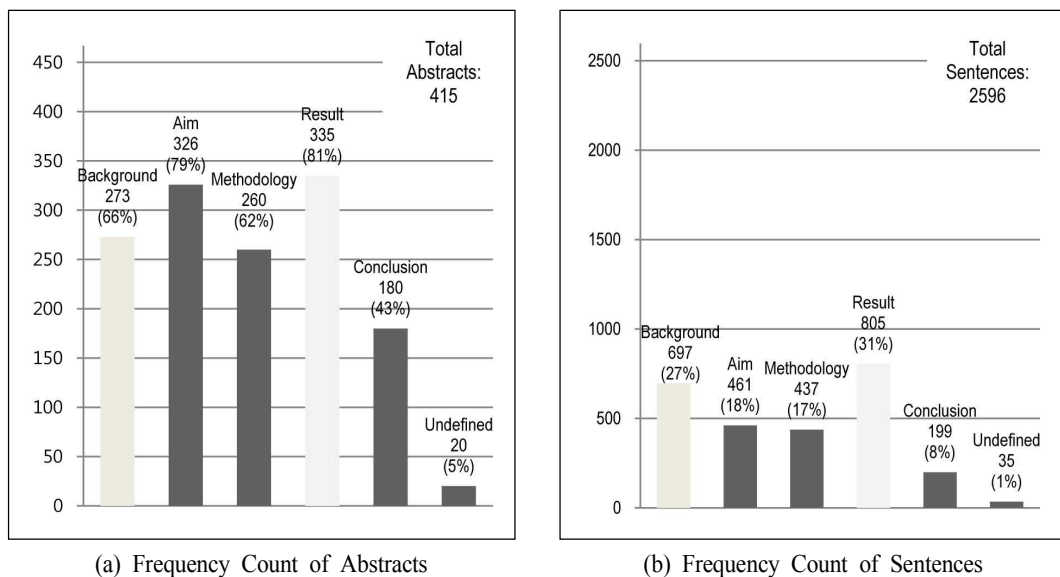
The results shown in Figure 2 (a) can be compared to other studies such as in Hartley and Betts,³⁸⁾ who examined abstracts in the field of social sciences so that they find move patterns. As shown in Table 3, the authors examined 100 samples, whereas the present study was based

36) Ali Akbar Khasseh and Ali Biranvand, “Structured vs. Unstructured Abstract: A Different Look at Iranian Journals of Library Science,” *International Research Journal of Applied and Basic Sciences*, Vol.4, No.7(2013), pp.1706-1709.

37) Michela Montesi and Blanca Gil Urdiciain, “Abstracts: Problems Classified from the User Perspective,” *Journal of Information Science*, Vol.31, No.6(2005), pp.515-526.

38) James Hartley and Lucy Betts, “Common Weaknesses in Traditional Abstracts in the Social Sciences,” *Journal of the American Society for Information Science and Technology*, Vol.60, No.10(2009), pp.2010-2018.

on 467 abstracts. One additional difference between Hartley and Betts³⁹⁾ and the present study is the sample selection. Hartley and Betts⁴⁰⁾ selected random samples based on five areas: ‘Health and Old Age’, ‘Schooling’, ‘New Technology’, ‘Higher Education’, and ‘Academic Writing’. The authors considered these areas as social sciences areas. The present study was also conducted in the social sciences field and applied the term ‘attitude’. Moreover, in Tseng⁴¹⁾ the author examined 90 research article abstracts from applied linguistics journals.



<Fig. 2> Frequency Counts Based on Moves

There are similarities among the studies. In Table 3, the percentage of abstracts that included the *Results* move seemed similar among the studies. In other areas, however, the discrepancy between the two moves was considerable. For example, the *Conclusion* move in this study appeared in only 43% of samples. On the other hand, the *Conclusion* move in Hartley and Betts⁴²⁾

39) *Ibid.*

40) *Ibid.*

41) Fan-ping Tseng, “Analyses of Move Structure and Verb Tense of Research Article Abstracts in Applied Linguistics Journals,” *International journal of English linguistics*, Vol.1, No.2(2011).

42) James Hartley and Lucy Betts, “Common Weaknesses in Traditional Abstracts in the Social Sciences,” *Journal of the American Society for Information Science and Technology*, Vol.60, No.10(2009), pp.2010-2018.

was present in 78% and the *Conclusion* move in Tseng⁴³⁾ was present in 74% of the samples. The difference even in the field of social sciences was considerably large compared to other moves. Additionally, the percentage of *Background* in all three studies was relatively low compared to other moves. The most notable similarity among these three studies is the ranking of moves in social science. The percentage of abstracts was higher for the top three moves - *Aim*, *Method*, and *Results* - than the *Background* and *Conclusion* moves.

<Tab. 3> Comparison of Move Distribution Among Studies

Moves	Results Shown in Figure 2(a) Social Science (N=415)	Hartley and Betts ⁴⁴⁾ Social Science (N=100)	Tseng ⁴⁵⁾ Applied Linguistics (N=90)
<1> Background	66%	56%	41%
<2> Aim	79%	92%	96%
<3> Method	62%	84%	97%
<4> Results	81%	88%	91%
<5> Conclusion	43%	78%	74%
Undefined	5%	Not Used	Not Used

VI. The Ordering of Moves

In general, a wide range of move patterns were observed. Figure 3 shows the frequency count of orders that was performed. Not all move patterns are shown on this graph and some details have been omitted due to the lengthy list of move patterns. As shown in the left side of this figure, a wide variation of moves at a sentential level was noticeable. A total of 333 sentence patterns could be observed. The index number indicates the sentential-level move pattern. Equivalent to left hand graph, the right-hand graph in Figure 3 shows that most sentential-level

43) Fan-ping Tseng, "Analyses of Move Structure and Verb Tense of Research Article Abstracts in Applied Linguistics Journals," *International journal of English linguistics*, Vol.1, No.2(2011).

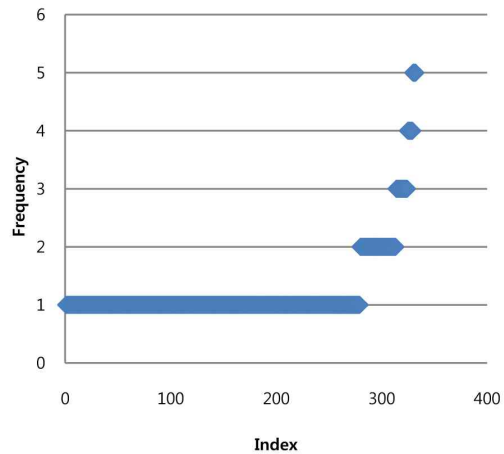
44) James Hartley and Lucy Betts, "Common Weaknesses in Traditional Abstracts in the Social Sciences," *Journal of the American Society for Information Science and Technology*, Vol.60, No.10(2009), pp.2010-2018.

45) Fan-ping Tseng, "Analyses of Move Structure and Verb Tense of Research Article Abstracts in Applied Linguistics Journals," *International journal of English linguistics*, Vol.1, No.2(2011).

move patterns are unique, having only 1 occurrence. The frequency count of index #331, #332 and #333 is 5. These are the most frequently occurred pattern.

Table 4 is to some extent equivalent to Figure 3, apart from the fact that the move pattern is shown in a block level. Since the list shows a wide range of sentential level moves, it was more convenient to remove the duplicate sentence tags to view only move patterns at a block level. For example, the move pattern <2> <3> <3> <4> <4> <5> can be reduced to <2><3><4><5>. In an ascending order, a frequency count of entire move patterns in a block level was performed. As shown in Table 4, a total of 76 block-level move patterns is found. Since the frequency of moves is counted based on block-level instead of sentential-level, the variation of move patterns is substantially less than Figure 3.

Index #	Move Pattern	Freq. Count
2	<1_2> <3> <4> <4> <4>	1
4	<1> <1> <1>	1
5	<1> <1> <1> <1>	1
6	<1> <1> <1> <1> <1> <1> <1> <1> <1><1>	1
7	<1> <1> <1> <1> <1> <1> <1> <1> <1> <1> <1> <1> <1><1>	1
.....		
.....		
.....		
326	<1> <1> <2> <3> <4> <4> <5>	4
327	<1> <2> <3> <4> <4>	4
328	<2> <3> <3> <4>	4
329	<2> <3> <3> <4> <4> <4>	4
330	<2> <3> <4> <5>	4
331	<1> <1> <1> <1> <1>	5
332	<1> <1> <1> <2>	5
333	<2> <3> <3> <4> <4> <5>	5



<Fig. 3> The Frequency of Move Pattern (Sentence Level)

An interesting observation can be made from Table 4. The most frequently used move pattern is <1> <2> <3> <4> <5>, which is BAMRC. It is a complete sequential order that does not contain any missing moves. The frequency count of this pattern is 40, which is approximately 10% of total traditional abstracts. Although this is a small percentage in comparison to the overall

amount of pattern, it does confirm that some traditional abstracts contain all five BAMRC categories and the ordering of moves in a sequential order.

The next frequency pattern is <2> <3> <4> and <2> <3> <4> <5>. The frequency count of move pattern <2> <3> <4> is 39, while the frequency count of <2> <3> <4> <5> is 37. In other words, a substantial amount of the abstracts opened with the *Objective* move rather than the *Background* move. A plausible explanation for this phenomenon is that the writers of abstracts might consider the *Background* and *Conclusion* as an optional move, while they might consider *Objective*, *Methods*, and *Results* as mandatory moves. In Table 4, the result pertaining to the frequently used moves is close to Kafes⁴⁶⁾ finding where *Objective*, *Method*, and *Results* were the most frequently used in journal article abstracts.

There are numerous instances where one or more moves are omitted in the abstract. Often the move order that contained one or more missing move is not in sequential order. For instance, the move pattern <2> <1> <3> <4>, which is not in sequential order, does not contain #5 either. A more common case is where move ordering of the sentences were not in complete sequential order due to missing moves. For instance, the move pattern <1> <2> <3> <4> is a partial sequential order due to the missing move # 5. The move pattern <2> <3> <4><5> is also in a partial sequential order due to the missing move #1.

In order to provide a more in-depth analysis, opening and closing move patterns were examined. As shown in Table 5, 272 abstracts opened with move <1> which is the *Background*. The next frequent opening move pattern was <2>, which is the *Objectives*. The result suggested that an optional opening move pattern was the *Objective*. This end result was also similar with Kafes⁴⁷⁾ finding where the most common opening move was *Background* or *Objective*. A total of 127 abstracts opened with <2>. When the opening move <1> and <2> were combined, the total percentage of opening abstract was approximately 96%. The result suggested with a greater confidence that the first sentence in an abstract in most cases are likely either *Background* or *Objectives*. The other opening move pattern was insignificant since the combined total is less than 5%.

46) Huseyin Kafes, "Cultural Traces on the Rhetorical Organization of Research Article Abstracts," *International Journal on New Trends in Education & Their Implications (IJONTE)*, Vol.3, No.20(2012).

47) Huseyin Kafes, "Cultural Traces on the Rhetorical Organization of Research Article Abstracts," *International Journal on New Trends in Education & Their Implications (IJONTE)*, Vol.3, No.20(2012).

〈Tab. 4〉 The Frequency Count of Move Pattern (Block Level)

Pattern Index #	Move Pattern	Frequency	Pattern Index #	Move Pattern	Frequency
1	<1> <2> <2_3>	1	39	<1> <2> <6> <5>	2
2	<1> <2> <2_3> <4>	1	40	<1> <4> <3> <5>	2
3	<1> <2> <3> <3_4> <4>	1	41	<1> <6> <5>	2
4	<1> <2> <3> <4> <2_4> <5>	1	42	<2> <1> <4> <5>	2
5	<1> <2> <3> <5>	1	43	<2> <2_3> <4> <5>	2
6	<1> <2> <3_4> <4> <5>	1	44	<2> <3> <1> <4>	2
7	<1> <2> <4> <3>	1	45	<2> <3> <5>	2
8	<1> <2> <4> <3> <5>	1	46	<2> <5>	2
9	<1> <2> <4> <4_5>	1	47	<2> <6> <5>	2
10	<1> <2> <6>	1	48	<2_3> <4> <5>	2
11	<1> <2> <6> <3> <4>	1	49	<1> <2> <5>	3
12	<1> <2_3_4>	1	50	<1> <2_3> <3> <4> <5>	3
13	<1> <3> <3_4> <4> <5>	1	51	<1> <2_3> <4> <5>	3
14	<1> <3_4> <4> <5>	1	52	<1> <5>	3
15	<1> <4> <2>	1	53	<2> <1>	3
16	<1> <6> <3> <4>	1	54	<2> <1> <4>	3
17	<1_2> <3> <4>	1	55	<2> <3>	3
18	<2> <1> <3>	1	56	<3> <4> <5>	3
19	<2> <1> <4> <3>	1	57	<2>	4
20	<2> <1> <5> <6> <4>	1	58	<2> <1> <3> <4> <5>	4
21	<2> <3> <6>	1	59	<1> <2> <3>	5
22	<2> <3> <6> <4>	1	60	<1> <4> <5>	5
23	<2> <3> <6> <4> <5>	1	61	<2> <1> <3> <4>	5
24	<2> <3_4> <4> <5>	1	62	<3> <4>	5
25	<2> <4> <1> <5>	1	63	<1> <2_3> <4>	6
26	<2> <6>	1	64	<1> <4>	8
27	<2> <6> <2_3> <4>	1	65	<2> <4> <5>	9
28	<2> <6> <4>	1	66	<2> <4>	16
29	<2> <6> <4> <5>	1	67	<1>	18
30	<2_3> <1> <3> <4>	1	68	<1> <2> <4> <5>	18
31	<2_3> <2> <3_4> <4>	1	69	<1> <3> <4> <5>	18
32	<2_3> <2> <4>	1	70	<1> <3> <4>	19
33	<2_3> <3> <4>	1	71	<1> <2> <4>	22
34	<2_3> <3> <4> <5>	1	72	<1> <2>	24
35	<3_4> <4>	1	73	<1> <2> <3> <4>	31
36	<6>	1	74	<2> <3> <4>	37
37	<6> <2> <3> <4_5>	1	75	<2> <3> <4> <5>	39
38	<6> <3> <4>	1	76	<1> <2> <3> <4> <5>	40

Note: The numbers indicate the following moves: <1> = Background, <2> = Aim, <3> = Method, <4> = Results, <5> = Conclusion, <6> = Undefined

Unlike the opening move pattern, a more wide range of move pattern associated with closing of abstracts was found in the dataset. As shown in Table 5, the most frequent closing move pattern is <5>, which is the *Conclusion*. 160 (41%) abstracts ended with *Conclusion*. The next frequent move was <4>, which is the *Results*. 165 abstracts ended with *Results*. The table shows that the common way of closing the abstracts is with the *Results* or the *Conclusion*. Other move patterns associated with opening of abstracts are worth mentioning. In Table 5, it is useful to note that the move <1>, <2>, and <3> are the *Background*, *Aim*, and *Method* respectively. A total of 18 (4.34%) abstracts ended with the move <1>, a total of 31 (7.47%) abstracts ended with the move <2> and a total of 9 abstracts ended with the move <3>. Thus, the results suggest that the BAMRC pattern is less certain toward the closing rather than the opening part of abstracts. Considering both the opening and closing segments of abstracts, the results possibly indicate a wide range of stylistic variety in the field of social sciences.

<Tab.5> Frequency Counts of Opening and Closing Move

	Criteria	Qty of Abstracts	Percentage of Moves
Opening Move	<1>	272	65.54%
	<2>	127	30.60%
	<3>	9	2.17%
	<4>	0	0.00%
	<5>	0	0.00%
	<6>	1	0.24%
	<1_2>	1	0.24%
	<2_3>	4	0.96%
	other	1	0.24%
	Total	415	100.00%
Closing Move	<1>	18	4.34%
	<2>	31	7.47%
	<3>	9	2.17%
	<4>	165	39.76%
	<5>	169	40.72%
	<6>	20	4.82%
	<4_5>	1	0.24%
	other	2	0.48%
	Total	415	100.00%

VII. Discussion

Up to this point, by examining move patterns in detail, the structural characteristics of traditional abstracts were discovered in the field of social sciences. In terms of move patterns, the findings of this study imply that traditional abstracts in the field of social sciences might not be homogeneous. Although there was a strong tendency toward BAMRC move orders, other forms of traditional abstracts such as indicative abstract might follow different move orders. In effect, in the field of social sciences authors and journals are more likely to contain a mixture of different move patterns as the result suggests.

This study re-examined Hartley and Betts⁴⁸⁾ through analysis and comparison. Furthermore, this study reconfirmed that more studies involving a large size of move analysis are needed to draw a more definite conclusion with respect to the overall move pattern in social sciences. Hartley and Betts⁴⁹⁾ investigated the characteristics of social science using only 100 abstracts in total. Although some noticeable pattern emerged, larger sample size drawn from different research article abstracts is preferable.

In addition, the present study re-confirmed that missing moves in traditional abstracts seemed unavoidable as authors are left to write traditional abstracts in a free writing form. Regardless of the move distribution differences among the studies that were examined, this study suggests that some amounts of missing moves can be expected in a given field. Missing information indicated the way authors view pertinent information in a traditional abstract may differ from the type of expected information in a structured abstract.

Questions might be raised as to the way this study is relevant to the improvement of the abstract format for the field of social sciences. As aforementioned, Hartley and Betts⁵⁰⁾ argued for the use of structured abstracts in social sciences; however, the focal point of this study is not to support or argue against the study conducted by Hartley and Betts.⁵¹⁾ The actual purpose

48) James Hartley and Lucy Betts, "Common Weaknesses in Traditional Abstracts in the Social Sciences," *Journal of the American Society for Information Science and Technology*, Vol.60, No.10(2009), pp.2010-20.

49) *Ibid.*

50) *Ibid.*

51) *Ibid.*

of the research is to provide additional insights into the traditional abstracts in the field of social sciences, and inspect the compatibility issues between traditional abstracts and structured abstracts in terms of moves. In this respect, the present study did not discover substantially different evidence to support the uses of structured abstracts in the examined field.

Yet, the analysis of move patterns in this study has some implications on the sub-headings of structured abstracts in the field of social science. In a sense, rather than selecting the sub-headings by experienced academics, move analysis is a more reasonable way to match and select the sub-headings for the structured abstracts. This study has demonstrated the commonalities of structural and functional components between the two types of abstracts. Altogether, this study confirmed that move ordering of a traditional abstracts tend to be consistent with the sub-headings in structured abstracts.

The type of moves in a given field or domain can raise a compatibility issue between structural abstracts and traditional abstracts. From the perspective of mapping, missing moves in traditional abstracts and the non-sequential move patterns would pose a challenge to traditional abstracts. In devising methods to map the sentences in traditional abstracts to structured abstracts automatically, additional procedures to resolve the incompatibility issues concerning moves in traditional abstracts to sub-headings in structured abstracts need to be investigated.

On the other hand, an informative abstract by definition suggests major common moves such as BAMRC. The move analysis might be an effective method in identifying appropriate sub-headings for a particular field. More compatible move types with sub-headings of structured abstracts could allow smoother conversion between two forms of abstracts. To this end, determining appropriate sub-headings for a particular field needs to be done by academics in a particular field.

VIII. Conclusion and Future Studies

By focusing on moves, this study explored ways to analyze the research abstracts in social science. This study's result was compared to the results in Hartley and Betts⁵²⁾ and others in order to examine characteristics of abstracts in social science. By analyzing move patterns

52) James Hartley and Lucy Betts, "Common Weaknesses in Traditional Abstracts in the Social Sciences," *Journal of the American Society for Information Science and Technology*, Vol.60, No.10(2009), pp.2010-20.

including opening and closing parts of abstracts, common missing moves and common orderings were identified. In general, the sentences appeared progressively in the BAMRC move order. Yet, due to missing moves, abstracts often did not include all BAMRC moves.

Some abstracts in the datasets did not follow the BAMRC move sequentially due to missing moves. Thus, relying on the location is not adequate as some sentences might not follow the particular order. It is an indication that some authors prefer to write abstracts more freely instead of writing in the BAMRC order. Some researchers even argued against this particular order. For instance, Noris⁵³⁾ suggested that the conclusion perhaps should appear in the opening instead of closing part of an abstract.

The present study analyzed move patterns in a particular datasets using different ways. A number of possible future studies shall be suggested. Firstly, a possible future research would be the investigation of pattern of moves with a specific type of traditional abstracts. For instance, a possible research of high interest could be the investigation of move ordering even further in order to identify additional type of traditional abstracts (e.g., indicative abstract). Such a suggestion is based on the assumption that patterns exist between the subtype of traditional abstract and the move order.

In addition, using a much larger sample size, a future study could be devised to compare move orderings and move distributions among a number of disciplines within the social sciences. The move distribution in this study differed considerably from the results in Hartley and Betts.⁵⁴⁾ More studies could be conducted to establish an expected move distribution in the field of social sciences. The fact that the move orders in the field of social sciences was examined as a whole proved to be a limitation of the present study. In a future research, a comparison could be made among disciplines within the field which might include sub-fields within the field which might include disciplines such as economics, sociology, psychology, among others.

Moreover, a larger variety of different types of move patterns should be examined for the field of social science. A move analysis based on move orders and move distribution could be applied to other fields as well. It would be more intriguing to compare move orders in social sciences to other fields such as humanities in an attempt to discover the differences. Although this study compared the results to the applied linguistics by using Tseng's⁵⁵⁾ study, more comparisons are

53) Carol Noris, "On Turning Posters Upside Down," *European Science Editing*, Vol.36, No.3(2009), pp.75.

54) James Hartley and Lucy Betts, "Common Weaknesses in Traditional Abstracts in the Social Sciences," *Journal of the American Society for Information Science and Technology*, Vol.60, No.10(2009), pp.2010-20.

essential. As a result, the degree in which moves are missing compared to other fields could be drawn in future works. Such knowledge should be useful in the course of designing a strategy to map traditional abstracts into structured abstracts. This could aid in automatically producing alternative abstract format.

Lastly, methods to resolve missing information by extracting information from the paper's contents need to be investigated. In particular, extractive techniques such as Aliguliyev⁵⁶⁾ and Song et al.⁵⁷⁾ should be considered. The application of these methods could be examined in the context of mapping traditional abstracts into structured abstracts. Perhaps specific computational techniques could be developed with some level of human efforts in mapping traditional abstracts to structured abstracts. For instance, a possible solution for 'excess of information' is to compress multiple sentences into one sentence for uniform distribution of sentences among structured abstract sub-headings. Furthermore, machine learning techniques could be applied in order to extract sentences from the body of the paper itself.

In a broader scope, the result of move analysis has practical applications in the areas of library and information science and could be used by students from this particular field. For example, students could be encouraged to examine different move patterns as a conscious effort in writing an effective abstract. Also, recognizing common patterns could perhaps become a feasible means to evaluate the quality of an abstract.

In conclusion, other findings that could be inferred from this study might also indicate that researchers are limited to accessing relevant abstracts; and relevant abstracts are not viewable to researchers, due to the limitations identified in the present study. Consequently, the results of this study also suggests the need for publications and publishers in social sciences to establish a common 'writers guidelines', similar to an ISO⁵⁸⁾ if possible, with a greater emphasis on the components of traditional abstracts.

55) Fan-ping Tseng, "Analyses of Move Structure and Verb Tense of Research Article Abstracts in Applied Linguistics Journals," *International journal of English linguistics*, Vol.1, No.2(2011).

56) Shashank Agarwal and Hong Yu. "Automatically Classifying Sentences In Full-Text Biomedical Articles into Introduction, Methods, Results, and Discussion," *Bioinformatics*, Vol.25, No.23(2009), pp.3174-3180.

57) Wei Song, Cheon Choi, L., Cheol Park, S., and Ding, X. Feng, "Fuzzy Evolutionary Optimization Modeling and Its Applications to Unsupervised Categorization and Extractive Summarization," *Expert Systems with Applications*, Vol.38, No.8(2011), pp.9112-9121.

58) International Standard Organization Home page, <<http://www.iso.org/>> [cited 2014. 6. 18].

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<Appendix> A Partial Listing of Journals Used in This Study

Accident Analysis and Prevention
Accounting Education
Addictive Behaviors
Administratie si Management Public
Advances in Gender Research
African and Asian Studies
Agroecology and Sustainable Food Systems
ALLA Review
American Journal of Health Behavior
American Journal of Pharmaceutical Education
American Journal of Sexuality Education
American Politics Research
American Sociological Review
Annales de Demographie Historique
Annals of Library and Information Studies
Annals of the American Academy of Political and Social Science
Annee Sociologique
Anthrozoos
Anuario de Estudios Americanos
Appetite
Applied Economics
Applied Ergonomics
Architectural Engineering and Design Management
Archives of Gerontology and Geriatrics
Arts in Psychotherapy
Asia Pacific Journal of Education
Asian Social Science
Australasian Journal of Educational Technology
Australian Journal of Emerging Technologies and Society
Australian Journal of Psychology
Australian Review of Applied Linguistics
Behavioral Sleep Medicine
Behaviour Research and Therapy
Behavioural and Cognitive Psychotherapy
BMC Medical Education
BMC Medical Ethics
Bulletin of Geography
Bulletin of Spanish Studies
Career Development International
CBE Life Sciences Education
Christian Higher Education
Cities
Cognition
Communication Monographs
Communication Research
Communications and Conflict
Communications in Information Literacy
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Computers and Education
Computers in Human Behavior
Conservation and Recycling
Cornell Hospitality Quarterly
Criminology Journal of Baikal National University of Economics and Law
Critique Internationale
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