A Comparison of Moves and the Sequence of Moves in Research Abstracts in Standard and Predatory Journals

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Abstract

The purpose of the recent study was to compare rhetorical moves and move sequences in scientific research articles published by standard and predatory journals. The corpus consisted of 100 research abstracts (50 standard and 50 predatory abstracts) published between 2011 and 2015. The abstracts were analyzed based on Santos's (1996) move model consisting of five main moves: 'Situating the research', 'Presenting the research', 'Describing the methodology', 'Summarizing the results', and 'Discussing the research'. To increase the reliability of the analysis, three inter-raters were invited to verify the data. The findings show five moves in two corpora. All moves in the standard corpus occurred more than 60% of the time and are considered as conventional moves. However, four moves in the predatory journal abstracts [Move 3 or 'Describing the methodology' (94%), Move 4 or 'Summarizing the results' (82%), Move 2 or 'Presenting the research' (68%), and Move 5 or 'Discussing the research' (64%)] occurred as conventional moves; Move 1, or 'Situating the research',

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which occurred in only 48% of cases, was an exception. In addition, 50 abstracts in the standard corpus exhibited 26 move sequences; on the contrary, in the predatory corpus of 50 abstracts, 41 move sequences were found. The findings reveal that moves and move sequences of predatory abstracts are varied and do not conform to those found in standard journals. Thus, it can be concluded that move analysis may be used to distinguish between standard (peer−reviewed) journals and predatory (non−peer−reviewed) journals.

Keywords: Move analysis, research abstract, scientific research article, predatory journals

บทคัดย่อ

วัตถุประสงค์ของงานวิจัยทางภาษาศาสตร์ฉบับนี้คือ ศึกษาอัตถภาค (Move) และ การเรียงลำดับของอัตถภาค (Move sequence) ในบทคัดย่อทางวิทยาศาสตร์ จากวารสารที่มีคุณภาพ และวารสารประเภทด้อยคุณภาพ (predator) คลังข้อมูลของงานวิจัยนี้ประกอบไปด้วย บทคัดย่อจำนวน 50 เรื่อง ที่ตีพิมพ์ระหว่าง ค.ศ. 2011 ถึง ค.ศ. 2015 จากวารสารคุณภาพ และบทคัดย่ออีก 50 เรื่อง จากวารสารด้อยคุณภาพ การวิเคราะห์อัตถภาคในบทคัดย่อในงานวิจัยนี้อาศัยหลักวิเคราะห์ตามทฤษฎีอัตถภาควิเคราะห์บทคัดย่อของ Santos (1996) ซึ่งมีองค์ประกอบ 5 ส่วนคือข้อมูลที่เป็นภูมิหลังการนำเสนองานวิจัย วิธีการวิจัยสรุปผลการวิจัยและการอภิปรายการวิจัย ทั้งนี้เพื่อเพิ่มความเที่ยงของการวิเคราะห์ข้อมูลผู้วิจัยได้วิเคราะห์ข้อมูลร่วมกับ ผู้วิเคราะห์ข้อมูลร่วม (inter-rater) อีก 3 ท่านผลการวิจัยพบว่า อัตถภาคทั้ง 5 พบในบทคัดย่อทั้ง 2 ประเภท โดยบทคัดย่อจากวารสารที่มีคุณภาพพบอัตถภาคทั้ง 5 ปรากฏมากว่าร้อย 60 แต่วารสารที่ด้อยคุณภาพโดยส่วนมากอัตถภาคพบเกินร้อยละ 60 ยกเว้น อัตถภาค 1 (Move 1 ‘Situating the research’) ในวารสารด้อยคุณภาพซึ่งพบต่ำกว่าร้อยละ 60 นอกจากนี้ บทคัดย่อจากวารสารที่มีคุณภาพมีรูปแบบการเรียงลำดับของอัตถภาค 26 รูปแบบ ในขณะที่บทคัดย่อของวารสารด้อยคุณภาพมีรูปแบบการเรียงลำดับของอัตถภาค 41 รูปแบบ ซึ่งแสดงให้เห็นว่าการปรากฏตัวของอัตถภาค และ การเรียงลำดับของอัตถภาค ในวารสารด้อยคุณภาพมีความหลากหลาย หรือ ไม่มีแบบฉบับ ดังนั้นจึงอาจกล่าวได้ว่า อัตถภาควิเคราะห์ สามารถใช้เป็นหลักเกณฑ์หนึ่งในการจำแนกประเภทวารสารที่มีคุณภาพ และด้อยคุณภาพได้

คำสำคัญ: อัตถภาควิเคราะห์บทคัดย่อ บทความทางวิทยาศาสตร์ วารสารด้อยคุณภาพ

1. Introduction

An academic journal is a periodical which rates articles adherence to ethical standards and the quality of the proposed article (Baker, 2015). A manuscript submission is reviewed by editorial broad members who are experts in the field; they scrutinize the quality of the work (Ware, 2013). Errors in the articles are eliminated by this process, so peer-reviewed articles are considered as standard. However, these journals take time to review and revise the papers submitted (Lovejoy, Revinson & France, 2011).

Unlike the standard journals, some journals, called predators, ignore ethical issues of publication (American Psychological Association, 2010; Roig, 2002, 2016). They have set up and manage the publication in order to charge an author a high fee for publication (Baker, 2015). Moreover, the practice of predatory journal is to publish research articles without peer review, thus undermining the entire peer review process. This kind of journal promises authors to rapidly publish their papers by minimizing or totally skipping the review process (Bowman, 2014). Consequently, there is a risk that flaws will remain in papers published by such predatory journals.

Beall (2013) offered the criticism that even an e-mail soliciting articles for publication from a predatory journal contained numerous grammatical and typographical errors. Furthermore, some other scholars have described the practices of predatory journals for example, Odom-Forren (2015) warned the nursing community about predatory publishers and Bradley-Springer (2015) reviewed the characteristics of predatory publishers. These scholars stated that researchers should use their judgment in selecting a journal for publishing their work because many journals, called predators, follow the model of having authors pay for publication. In other words, these journals are only concerned with the money that they obtain from researcher.

Piamsa–nga (2016), the deputy director for Research Information at Kasetsart University, gave cautioned researchers to avoid publishing articles with predatory journals for two reasons. (1) The articles published in predatory journals cannot be used for academic promotion or to receive research funding. (2) A researcher who publishes a paper in a predatory journal will lose the opportunity to develop his/her skills by revising the work according to the recommendation of the reviewers because predatory journals often accept papers submitting articles to this review process. Thus, the Faculties of Graduate Studies of leading universities in Thailand such as Chulalongkorn University (2015) and King Mongkut's University of Technology Thonburi (KMUTT) (Sombutpob, 2014) warn their students and faculty members not to publish their research papers in journals which are appeared on Beall's List because these Faculties do not accept such publications, meaning that students cannot complete their program. Researchers, both professional and inexperienced, can be at risk of becoming victims of predatory journals because of their lack of consideration for the harm done by publishing their papers in such journals and because of their lack of ability to distinguish between predatory and standard journals (Beall, 2013; 2014). Therefore, researchers must check the status a journal before submitting a paper (see Criteria for Evaluating the Quality of Journals (Faculty of Science, Mahidol University, 2016) and Academic Journals, Harm of Predator Journals and Research (Wittayavuttikul, 2013) (for more details).

Bhad and Hazari (2015) emphasize the fact that the predatory articles are also problematic in terms of language and the format, which appears non–standard. An investigation on grammatical and spelling errors, one significant feature of predatory journals mentioned by Bhad and Hazari (2015) and Beall (2013), was conducted by Anghirun and Soranastaporn (2015). They found that in predatory journal abstracts, a large number of grammatical errors were found, including orthography (punctuation, capitalization, and spelling), syntax (articles, conjunctions, prepositions, word order), morphology (plural and tense markers), and lexis (word choice).

Apart from grammatical aspects, another critical focus in the analysis of research articles is the information structure. Swales (1990) investigated the structure of the introduction of research articles, Bhatia (1993) investigated the structure of the abstract of research articles, and Basturkmen (2012) investigated the structure of research articles; their results reveal that the research articles used specific structures for presenting their information.

However, the researchers mentioned above investigated the information structure of reviewed articles. The researchers in the present study found a gap that the research articles published in predatory journals (without a review process) have never been examined in terms of the information structure. The difference in publishing procedures in terms of the reviewing process is a possible factor leading to differences in the information structure in standard and predatory journal articles. Therefore, the move analysis in this study will help researchers to differentiate between these two journals and avoid being victims of predatory journals, but rather serve to raise awareness of these researchers.

1.1 Move Analysis

In this study, the functions and sequencing in abstracts in both standard and predatory journals were analyzed by adopting the notion of move analysis. Move analysis is a tool for identifying the organization of information in a particular genre (Swales, 1990). The benefit of move analysis is to show the communicative structure of a particular text type (Kanoksilapatham, 2007). According to Bhatia

(1993), a move indicates a specific function of a communicative unit in the text, similar to the units of sentences and clauses, which convey the purpose of the communication. A move analysis reveals the particular information which is included in the text (Samraj, 2014). Thus, move analysis shows the types of information contained in a particular text and how the information is arranged (move sequences).

Move analysis research has focused on the organization of texts. For example, Swales (1990) analyzed the introduction section of research articles; and proposed three moves: Establishing a territory, Establishing a niche, and Occupying the niche. In addition, Kanoksilapatham (2005) analyzed moves in biochemistry research papers and found that these papers consisted of introduction, methods, results, and discussion sections. Also, she proposed criteria for classifying conventional moves (those occurring at least 60% of the time) in the corpus.

1.2 Move Analysis of Abstracts

An abstract is a synopsis of the whole research paper (Branson, 2004; Cargill & Connor, 2009; Derntl, 2014). The abstract functions mainly to inform readers of what the article is about (Glasman-Deal, 2010; Scocolofsky, 2004). Thus, readers can decide whether or not to read the whole article.

Many previous studies in move analysis have been conducted on research article abstracts in the social sciences and the hard sciences. The group of studies about social science abstracts consists of Martin (2003), who compared Spanish and English social science abstracts; Pho (2008), who conducted research into abstracts in applied linguistics and educational technology; and Pasavoravate and Wijitsopon (2011), who examined moves in social science abstracts. The latter group (studies in science) includes Cross and Oppenheim

(2006), who investigated moves in protozoology abstracts; Kanoksilapatham (2009), who studied moves in the abstracts of biochemistry, microbiology, civil engineering, and software engineering articles; Prabripoo (2009), who investigated the organization of scientific thesis abstracts; Samraj (2012), who conducted a comparative move analysis of biological science abstracts; and recently Yathip and Soranastaporn (2015); who studied move sequences in 50 scientific abstracts.

Biology and protozoology in the studies of Cross and Oppenheim (2006), Kanoksilapatham (2009), and Samraj (2012), who all studied research abstracts, are scientific branches. Studies in the social sciences covered both specific and broad fields (e.g. Martin, 2003; Pho (2008). It is therefore necessary to investigate the moves in abstracts in broader areas of scientific research. Furthermore, the present study can be considered an extension of the work of Martin (2003) and Samraj (2012) because most previous studies only investigated abstract organization in a single corpus. The present study also follows on the work in move analysis found in the studies by Pasavoravate and Wijitsopon (2011) and Yathip and Soranastaporn (2015) by exploring the sequence of moves in abstracts.

In order to fill this gap, the main objectives of this present study are: to compare the frequency and sequence of moves in scientific abstracts in standard and predatory journals.

2. Research Methods

Sources for the corpora, research instruments, and methods of data analysis are presented in this section.

2.1 Source of Corpora

The research included two corpora, consisting of 50 scientific abstracts from a standard journal and 50 abstracts from a predatory journal, all published between 2011 and 2015. The number of abstracts in the present corpus was adequate for the analysis. The abstracts in both corpora were collected from scientific areas without focusing on specific disciplines or topics. In order to obtain these two corpora, criteria were set for selecting standard and predatory journals.

2.1.1 Standard Journal Selection

The Eigen factor score was used as the standard for selecting the standard journals in this study because the Eigen factor score reflects the prestige of a journal by considering the number of citations. However, citations in influential journals are more highly valued than citations in less influential journals (Thomson Reuters, 2012). Moreover, the Eigen factor score excludes self-citations. As a consequence, *Nature*, which obtained the highest Eigen factor score at 1.50140, was chosen.

2.1.2 Predatory Journal Selection

The selection of a predatory journal followed four steps. The journal had to be on Beall's (2015) blacklist. Editors of credible nursing journals recommended the list so that researchers, editors, and authors can check whether a journal which they are about to read or to which they are about to submit an article is a predatory journal (INANE, 2014). Beall (2015) listed 507 predatory journals. The researcher found 433 scientific journals. Among the 433 journals, 100 had been published for at least five consecutive years. Finally, the *International Journal of Current Science*, one of these 100 predatory journals, was randomly selected as the source for the data.

2.1.3 Selection of Research Abstracts

To obtain 50 abstracts for each corpus, the researcher used proportional stratified random sampling to classify the population into groups by year of publication, and then calculated the sample size for articles from each year. Then the researcher randomly selected 50 research papers for each year of publication. (See Table 1.)

Table 1 Number of research articles from standard and predatory journals

Year of publication	Standard journal		Predatory journal	
	N	*n*	*N*	*n*
2011	136	10	15	2
2012	139	10	104	15
2013	143	11	105	16
2014	174	13	68	10
2015	83	6	46	7
Total	675	50	338	50

2.1.4 Text Corpus

The guideline to authors found in the standard journal permits an abstract to be up to 150 words in length and the predatory journal permits an author to write an abstract of around 150 to 300 words. The number of words in the 50 abstracts from the standard and the predatory corpora and the average number of words in a single abstract are presented in Table 2.

Table 2 Number of words in the corpora

Number of words in the corpora	50 abstracts	each single abstract
Standard corpus1	7685	153.7
Predatory corpus2	8040	160.8

$n^1 = 50$, $n^2 = 50$

2.2 Research Instruments

Four research instruments were used: (1) Santos's model (1996) was used as the guideline for analyzing the organization of abstracts; the model is presented in Table 3.

Table 3 Santos's model for research article abstracts

The Five Moves/Submoves		
Move1:	Situating the research	The model includes five moves. Move 1 'Situating the research' presents an introduction to the research involving a statement of the problem, background information for the research and a review of previous studies. The second move is 'Presenting the research', which describes the objectives of the study, research question, and hypotheses. Move 3 'Describing the methodology' gives information about participants, research design, procedures, research tools, and data analysis. Fourth is 'Summarizing the results', giving a brief summary or highlights of the research findings. It also reports on how the data were analyzed. Move 5, 'Discussing the research', discusses and interprets the results of the research.
Submove1A:	Stating current knowledge and/or	
Submove1B:	Citing previous research and/or	
Submove1C:	Extending previous research and/or	
Submove2 :	Stating the problem	
Move2:	Presenting the research	
Submove1A:	Indicating main features and/or	
Submove1B:	Indicating main purpose and/or	
Submove2:	Hypothesis raising	
Move3:	Describing the methodology	
Move4:	Summarizing the results	
Move5:	Discussing the research	
Submove1:	Drawing conclusions and/or	
Submove2:	Giving recommendations	

(2) The word processing program, Microsoft Word was used to separate abstracts into sentences because sample abstracts were collected from an electronic database and then the program displayed the abstracts with sentence boundaries marked. (3) The form for data analysis contains all sentences from the abstracts from both corpora and was used to identify the moves represented in each sentence. (4) Another procedure was coding, which was used to label the sentences according to the types of moves: M1 (Move1), M2 (Move2), M3 (Move3), M4 (Move4), and M5 (Move5).

2.3 Inter-Rater Reliability

Three raters were invited to participate in order to insure the reliability of the findings. The firstrater is a professional scientist. The other two are master's degree students studying Applied Linguistics in an international program. These inter-raters were trained to analyze moves in scientific abstracts based on Santos's (1996) model. During the data analysis, the researcher and inter-raters checked the accuracy of the analyzed data after the analysis of every ten abstracts. Then two English teachers (one Thai and one native speaker) randomly selected analysis results for a final check on accuracy. The analyzed data from the three inter-raters and the researcher was computed for inter-rater reliability using Fleiss's Kappa, yielding results of 0.7 and 0.73 for the standard and predatory corpora respectively. According to Landis and Koch-Kappa (1977)'s Benchmark scale, these Kappa values indicate the analyses of the data are in substantial agreement (as cited in Gwet, 2014, p. 124).

2.4 Data Analysis

In preparation, the researcher separated the selected abstracts into sentence units in a spread sheet program. Additionally, three inter-raters were trained to use Santos's model to identify the moves accurately. After that, the researcher and three inter-raters analyzed the data independently and individually. Then the analyses from all raters and the researcher were compared and inter-rater reliability was calculated. When the individual analyses did not achieve mutual agreement, the discrepancies were discussed by the inter-raters, the researcher, and the two English teachers to arrive at a final agreement. Finally, the data were classified into types of moves and sequences of moves.

3. Results

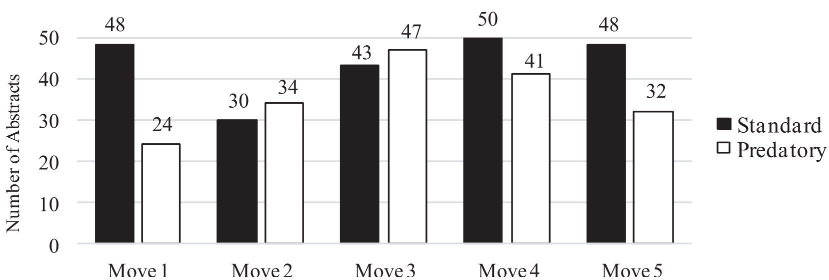

Figure 1 Comparison of moves in standard and predatory journals

The results for move frequency and move sequence are presented below.

3.1 Move Frequency in Abstracts of Standard and Predatory Journals

All five main moves in the model of Santos (1996) were found in both standard and predatory abstracts. These findings are presented in Figure 1 and the percentages of occurrence in the corpora of standard and predatory abstracts are presented in Table 4.

Table 4 Frequencies and percentages of move occurrence in standard and predatory corpora

MoveOccurrence	Corpus			
	Standard[1]		Predatory[2]	
	f	%	*f*	%
Move1: Situating the research	48	96	24	48
Move2: Presenting the research	30	60	34	68
Move3: Describing the methodology	43	86	47	94
Move4: Summarizing the results	50	100	41	82
Move5: Discussing the research	48	96	32	64

$n^1 = 50$, $n^2 = 50$

Move 1 or 'Situating the research' occurred two times more often in the abstracts of the standard corpus (n = 48, 96%) than in the predatory corpus. See example 1. (SA= Standard Abstract, PA = Predator Abstract, and S = Sentence)

Example 1

Circadian (24 hour) clocks are fundamentally important for coordinated physiology in organisms as diverse as cyanobacteria and humans. [SA2S2]

Salmonella typhi, an enteric pathogen causing typhoid fever, is still extremely common in developing parts of the world. [PA1S1]

Move 2 or 'Presenting the research' was found less frequently instandard abstracts (n = 30, 60%) than in the predatory corpus (n = 34, 68%). See example 2.

Example 2

We investigated the role of AUTS2 as part of a previously identified PRC1 complex (PRC1–AUTS2), and in the context of neurodevelopment. [SA39S3]

The present study was aimed to analyse the physico-chemical qualities of tap water of Chandigarh. [PA44S2]

Move 3 or 'Describing the methodology' occurred less often in abstracts in the standard corpus (*n* = 43, 86%) than in the predatory corpus (n = 47, 94%). See example 3.

Example 3

To assess the perturbations of gene expression in trisomy 21, and to eliminate the noise of genomic variability, we studied the transcriptome of fetal fibroblasts from a pair of monozygotic twins discordant for trisomy 21. [SA348S2]

Their 16s rDNA sequences thus obtained were submitted to NCBI Genbank database and Genbank id JX826634 and JX826635 were assigned respectively. [PA34S8]

Move 4 or 'Summarizingthe results' was found in all standard abstracts (n = 50, 100%), which is nearly 20% more than in the predatory corpus (*n* = 41, 82%). See example 4.

Example 4

> *In addition, we show that the symbionts of Bathymodiolus mussels from Pacific vents have hupL, the key gene for hydrogen oxidation. [SA5S5]*
>
> *The ethoanolic leaf extract showed the presence of fourteen chemical compounds in this, mom inosital 41.74%, plamitic acid 6.93%, phytol 8.26%, alpha-linolenic acid 22.60% are in considerable proportion and have medicinal values. [PA6S3]*

Move 5 or 'Discussing the research 'by presenting conclusions and recommendations was found in abstracts of the standard corpus (n = 48, 96%) more often than in the predatory corpus (n = 32, 64%). See example 5.

Example 5

> *Our results indicate that distinct premotor brainstem nuclei access spinal subcircuits to mediate task-specific aspects of motor programs. [SA33S7]*
>
> *Out of which the toxic elements viz. Cr and Pb are potential threat to our health. [PA3S3]*

To sum up, although all five moves based on Santos (1996) were found in the two corpora in this present study, the frequencies and percentages of occurrence for each move are different. The findings show that Move 1, Move 4 and Move 5 were more frequently found in the standard corpus; the other two, Move 2 and Move 3, were more frequently found in the predatory corpus.

3.2 Move Sequences in Abstracts of Standard and Predatory Journals

The analysis of move sequencing or the arrangement of moves in abstracts was the second purpose of this present study. Move sequencing explores the positions of moves in a particular abstract. Two aspects regarding move sequence are reported.

3.2.1 Overall Comparison of Move Sequences

The findings for move sequence in standard and predatory corpora are presented in Table 5.

Table 5 Comparison of move sequences in standard and predatory journals

StandardCorpus[1]			**Predatory Corpus[2]**		
Patterns of Sequences	***f***	**%**	**Patterns of Sequences**	***f***	**%**
Pattern 1	19	38	**Pattern 1**	11	22
M1-M3/2-M4-M5	6	12	M1-M3-M4	2	4
M1-M3-M4-M5	4	8	M1-M3-M4-M5	2	4
M1-M3/2-M3-M4-M5	2	4	M1-M3	1	2
M1-M3-M2/3-M4-M5	1	2	M1-M3-M1-M2/3-M3-M4-M5	1	2
M1-M3-M4-M3-M5	1	2	M1-M3-M4-M3-M4-M5	1	2
M1-M3-M4-M4/3-M4-M5	1	2	M1-M3-M5	1	2
M1-M3-M4-M4/3-M5	1	2	M1-M3-M5-M4-M5-M3/4-M5	1	2
M1-M3/4-M3-M4-M5	1	2	M1-M3-M3/2-M3-M5	1	2
M1-M3/4-M4-M5	1	2	M1-M3/2-M4-M5	1	2
M1-M3/2,3-M4-M5	1	2	**Pattern 2**	8	16
Pattern 2	18	36	M1-M2-M3-M4-M5	2	4
M1-M2/3-M4-M5	9	18	M1-M2/3-M4-M5	2	4
M1-M2-M3-M4-M5	2	4	M1-M2-M3	1	2
M1-M2-M1-M4-M5	1	2	M1-M2-M3-M3/2-M3-M4-M5	1	2
M1-M2-M3/2-M4	1	2	M1-M2/3-M3-M4-M5	1	2
M1-M2-M4/5-M5	1	2	M1-M2/3-M3/2-M4-M5	1	2
M1-M2/3-M3-M4-M5	1	2	**Pattern 3**	7	14
M1-M2/3-M3-M4/3-M5	1	2	M3-M3/2-M4-M5-M4-M5	1	2
M1-M2/3-M4	1	2	M3-M3/4-M3-M3/4	1	2
M1-M2/3-M4-M3/4	1	2	M3/2-M3-M4-M3-M4-M3/2	1	2
Pattern 3	11	22	M3/2-M3-M4-M3/4-M4-M5	1	2
M1-M4-M5	5	10	M3/2-M3-M5	1	2
M1-M4/3-M4-M5	2	4	M3/2,3-M3-M3/2	1	2
M1-M4/3-M5	2	4	M3/2,3-M3-M4-M4/5-M4-M5	1	2
M1-M4-M3/4-M5	1	2	**Pattern 4**	6	12
M1-M4/3-M1-M4-M1-M5	1	2	M2-M3-M4-M5	3	6
Pattern 4	1	2	M2/3-M3-M4-M1-M4	1	2
M3-M3/2,4-M4/3-M5	1	2	M2/3-M3-M4-M3-M4	1	2
Pattern 5	1	2	M2/3-M3-M3/4-M4	1	2
M3/2-M2/3-M4-M5	1	2	**Pattern 5**	6	12
			M3/2-M4-M5	2	4
			M3-M4	1	2
			M3-M4-M3-M4	1	2
			M3-M4-M5	1	2
			M3-M4-M5-M4/3-M5	1	2
			Pattern 6	5	10
			M2/3-M4	2	4
			M2-M4-M5	1	2
			M2/3-M4-M5	1	2
			M2/3-M4-M4/3-M4-M3	1	2
			Pattern 7	2	4
			M2-M1-M3/2-M3-M4-M3	1	2
			M2/3-M1-M3-M4	1	2
			Pattern 8	2	4
			M5/3-M3	2	4
			Pattern 9	1	2
			M1	1	2
			Pattern 10	1	2
			M1-M4-M5-M2-M5	1	2
			Pattern 11	1	2
			M3-M2-M3-M4-M5	1	2

$n^1 = 50$, $n^2 = 50$

Note: M_1/M_2 = $Move_2$embedded in $Move_1$

$M_1/M_2,M_3$= $Move_2$ and $Move_3$ embedded in $Move_1$

The standard corpus of 26 move sequences can be grouped into five move sequence patterns according to the two initial moves. For example, Pattern 1 is a group of move sequences beginning with Move 1 and Move 3. However, 41 move sequences were found in the predatory corpus; they can be categorized into 11 move sequence patterns. In this paper, only a comparison in terms of frequency of move sequences for Pattern 1 and Pattern 2, which were the most frequently found patterns, is described (see Yathip, 2015, for more details).

Move Pattern 1: The most frequently occurring move sequence from the standard corpus was Pattern 1, in which the sequence started with Move 1 followed by Move 3. This group accounted for 38% of the corpus. The pattern of Move 1 and Move 3 in the initial position was also found as the most frequent pattern in the predatory corpus. However, Pattern 1 occurred 22% of the time in the predatory corpus, which is about half as often as in the standard corpus. The abstract below is an example of Pattern 1 (Move 1 followed by Move 3). To make the move identification clear, the keywords for each move are underlined differently: Move1, Move2, Move3, Move4, and Move5.

Example 6: Move Pattern 1 from the Standard Corpus

> *The exact positions of nucleosomes along genomic DNA can influence many aspects of chromosome function. However, existing methods for mapping nucleosomes do not provide the necessary single-base-pair accuracy to determine these positions. Here we develop and apply a new approach for direct mapping of nucleosome centres on the basis of chemical modification of engineered histones. The resulting map locates nucleosome positions genome-wide in unprecedented detail and accuracy. It shows new aspects of the in vivo nucleosome organization that are linked to transcription factor binding, RNA polymerase pausing and the higher-order structure of the chromatin fibre. [SA11]*

Example 7: Move Pattern 1 from the Predatory Corpus

> *The ethanolic and hexane extracts of Indigo feratinctoria Linn. Fabaceae leaves growing in Thiruvannamalai district, South India were subjected for pharmacognosy analysis of bio-active compounds by using GC-MS method. The ethoanolic leaf extract showed the presence of fourteen chemical compounds in this, mom inosital 41.74%, plamitic acid 6.93%, phytol 8.26%, alpha-linolenic acid 22.60% are in considerable proportion and have medicinal values. [PA6]*

Move Pattern 2: The second most frequently found pattern of move sequences in the standardcorpus was Move 1 followed by Move 2, which was found in 18 abstracts (36%). Similarly, in the predatory corpus, the pattern of Move 1 followed by Move 2 was the second most frequently found. This occurred in eight abstracts (16%) or as often as in the standard corpus. The move sequences in Pattern 2 are illustrated by the following abstracts.

Example 8: Move Pattern 2 from the Standard Corpus

> *Efforts to extract a Greenland ice core with a complete record of the Eemian interglacial (130,000 to 115,000 years ago) have until now been unsuccessful. The response of the Greenland ice sheet to the warmer-than-present climate of the Eemian has thus remained unclear. Here we present the new North Greenland Eemian Ice Drilling ('NEEM') ice core and show only a modest ice-sheet response to the strong warming in the early Eemian. We reconstructed the Eemian record from folded ice using globally homogeneous parameters known from dated Greenland and Antarctic ice-core records. On the basis of water stable isotopes, NEEM surface temperatures after the onset of the Eemian (126,000 years ago) peaked at 864 degrees Celsius above the mean of the past millennium, followed by a gradual cooling that was probably driven by the decreasing summer insolation. Between 128,000 and 122,000 years ago, the thickness of the northwest Greenland ice sheet decreased by 4006250 metres, reaching surface elevations 122,000 years ago of 1306300 metres lower than the present. Extensive surface melt occurred at the NEEM site during the Eemian, a phenomenon witnessed when melt layers formed again at NEEM during the exceptional heat of July 2012. With additional warming, surface melt might become more common in the future. [SA 27]*

Example 9: Move Pattern 2 from the Predatory Corpus

> *Heavy metals are important environmental pollutants and many of them are toxic even at very low concentrations. As a result of human activities such as mining and smelting of metalliferous, electroplating, gas exhaust, energy and fuel production, fertilizer and pesticide application etc. metal pollution has become one of the most serious environmental problems today. Aim of the present investigations was to determine lead, cadmium and chromium accumulation and distribution in the grass species Echinochloacolona. In the present study experiments were conducted using grass species Echino-chloacolona L. The species belongs to Poaceae family. Echinochloacolona commonly known as Jungle rice has an Indian origin. The accumulations of heavy metals (Lead, Cadmium and Chromium) in the plant body were com-pared with that of the control experiments. Bioconcentration factor of lead was 0.93, cadmium BCF was 35.26 and chromium BCF was 3.51. Based on the total accumulations and bioconcentration factor values the grass species has accumulated metals in the following order chromium> cadmium> lead. The Echinochloacolona can be used as an effective phytoextractor of metals. [PA48]*

In short, the sequence of moves in the standard corpus can be grouped into five patterns; however, 11 different patterns of move sequences occur in the predatory corpus. Moreover, the frequency of use of the patterns in the corpora is different.

3.2.2 Common Move Sequences in the two Corpora

This section reports the move sequences commonly found in both the standard and predatory corpora. (See Table 6.)

Table 6 Common move sequences in two corpora of abstracts

Move Sequences	Corpus			
	Standard1		Predatory2	
	f	%	*f*	%
M1-M2-M3-M4-M5	2	4	2	4
M1-M2/3-M3-M4-M5	1	2	1	2
M1-M2/3-M4-M5	9	18	2	4
M1-M3-M4-M5	4	8	2	4
M1-M3/2-M4-M5	6	12	1	2
Total	22	44	8	16

$n^1 = 50$, $n^2 = 50$

Note: M_1/M_2= Move2 embed in Move1

Table 5 reveals five sequences of moves commonly found in the two corpora: M1-M2-M3-M4-M5, M1-M2/3-M3-M4-M5, M1-M2/3-M4-M5, M1-M3-M4-M5, and M1-M3/2-M4-M5. Nevertheless, the proportion for these sequences in the standard corpus (44%) is about two times higher than for the predatory corpus (16%). The occurrences of these are compared and divided into two groups: occurring at the same frequency and occurring at a different frequency.

The former group consisted of the sequences M1-M2-M3-M4-M5 (4%) and M1-M2/3-M3-M4-M5 (2%).

The other three sequences of moves were more frequently found in the standard corpus than in the predatory corpus. The sequence of M1-M2/3-M4-M5 was found in 18% of abstracts in the standard corpus, which is about four times more frequently than in the predatory corpus (4%). The sequence M1-M3-M4-M5 was found in 8% of abstracts in the standard corpus, while this sequence was found in only 4% of abstracts in the predatory corpus, or half as often as in the standard corpus.

The last sequence is M1–M3/2–M4–M5. The occurrence of this sequence in the standard corpus (12%) is six times higher than its occurrence in the predatory corpus (2%).

In short, both the standard and predatory journals provide examples of all five move sequences. However, in considering the frequency of occurrence, the first two sequences occur in the same proportion in the standard and predatory corpora: M1–M2–M3–M4–M5 and M1–M2/3–M3–M4–M5. The other three were more frequently found in the standard than in the predatory corpus: M1–M2/3–M4–M5, M1–M3–M4–M5, and M1–M3/2–M4–M5.

4. Discussion

The discussion section consists of two parts: the findings regarding moves and those regarding move sequence in the standard and predatory abstract corpora.

4.1 Comparison of Move Occurrence

Three aspects of the findings about the moves themselves are discussed.

4.1.1 Conventional Moves

Previous move analyses have classified the moves found in corpus in terms of frequency and percentage of occurrence (e.g. Santos, 1996; Martin, 2003; Kanokilapatham, 2005; Cross & Oppenheim, 2006; Pho, 2008, Kanoksilapatham, 2009). However, these studies did not propose exact criteria for classifying the frequency of moves. Only the study of Kanoksilapatham (2005) classified moves occurring in the corpus at least 60% of the time as conventional and moves occurring less than 60% of the time as optional. This cut–off point was also adopted by Pasaworavate and Wijitsopon (2011). The findings in this present study reveal that the two corpora in this study are different in terms of conventional moves.

All of the moves found are considered as conventional moves in the standard corpus. To explain, the findings for this corpus match with the general recommendations for writing an abstract which have been proposed by Branson (2004), Scocolofsky (2004), Cargill and Connor (2009), and Glasman-Deal (2010). They noted that a general abstract is composed of five fundamental components, which are introduction, objective, methods, results, and conclusion. These five components are parallel to the five moves found in the standard corpus.

However, Move 1 (48%) in the predatory corpus was found less than 60% of the time. Move 1 was omitted in 26 abstracts by the writers of articles in the predatory corpus. Move 1, or 'Situating the research', gives the reader information about the background to the research, including background information, statement of the problem, and limitations of previous studies. Moreover, this part serves to educate the readers and help them to understand the field of study. Abstracts lacking this kind information can cause problems in comprehension for readers who do not have prior knowledge of the research.

4.1.2 Obligatory Moves

Santos (1996) indicated that Move 2, 'Presenting the research', which occurred in 98% of the abstracts, is an obligatory move. Moreover, Pho (2008) identified Moves which occurred 100% of the time in the corpus as obligatory moves. The present study shows that Move 4, or 'Summarizing the results' (100%), is an obligatory move in the standard corpus, which is consistent with the findings of

Cross and Oppenheim (2006). On the contrary, Move 4 in the predatory corpus is not an obligatory move.

The occurrence of Move 4 in all standard abstracts indicates that Move 4 cannot be omitted in scientific abstracts. The obligatorily presence of Move 4 in the standard corpus also correlates with the results from the work of Cross and Oppenheim (2006), who investigated moves in protozoology abstracts and found Move 4 in all abstracts in the corpus. The obligatory presence of include Move 4 in the standard corpus and the study by Cross and Oppenheim (2006) can indicate that research abstracts must provide information about the results. Results are considered as the most important point of research articles; thus, researchers must report research findings in all research abstracts (Branson, 2004).

Nevertheless, Move 4 in the predatory corpus occurred in 41 abstracts, or 82% of the abstracts in the corpus. Although the occurrence of Move 4 can be considered as conventional, some writers omitted the results section in the abstract. Move 4 summarizes the results of the research in brief for the reader (Santos, 1996). According to Durbin (2009), when writing an abstract, information about the results must be given to the reader. Without a summary of the results, the abstracts are not complete.

4.1.3 Occurrence of Move 5 in the Standard Corpus

Forty-eight abstracts in the standard corpus included Move 5 or 'Discussing the research'. Move 5 gives readers information about the conclusions that result from the research and also presents recommendations for further research and implementation of the research. This helps the reader to understand the results. The presence of Move

5 in the standard abstracts is consistent with the analyses of Prabripoo (2009) and Samraj (2014); in contrast, the occurrence of Move 5: 'Discussing the research' was less frequent in the predatory corpus than in the standard corpus.

The move analysis by Prabripoo (2009) on thesis abstracts in science showed that the conclusion move was found in 90% of the abstracts in the corpus. Similarly, Samraj (2014) conducted a move analysis for abstracts in the biological sciences and found the 'Conclusion Move' (80%) as the most frequent move. The conclusion in these two previous studies summarized the research and contained information about implications and recommendations, which are related to Move 5 or 'Discussing the research' in Santos (1996).

On the contrary, Move 5 was found in 32 abstracts (64%) in the predatory corpus. Move 5 in the predatory corpus is 4% above the cut-off point for conventional moves. Move 5 in the predatory corpus occurred 34% less often than in the standard corpus. This indicates that the authors of articles in the predatory corpus did not include information about the conclusion in the research abstracts.

The difference in terms of frequency for Move 5 between the standard and predatory corpora is the largest difference in the two corpora. More than one-third of the articles found in the predatory journals did not contain a conclusion (Move 5), whereas almost all of the authors of articles in standard articles included this move.

4.2 Comparison of the Occurrence of Move Sequences

Three points, the number of move sequences, the non-linearity of move sequences and common move sequences in the findings for move sequence in predatory and standard corpora are discussed.

4.2.1 Number of Move Sequences

The standard corpus showed 26 move sequences (five patterns) and the predatory corpus showed 41 move sequences (11 patterns). This indicates differences in the organization of abstracts in the predatory corpus. Move sequences found in the predatory corpus differ from those found by Pasavoravate and Wijitsopon (2011), who found four move sequence patterns in applied linguistic thesis abstracts. This shows that the standard and thesis abstracts were written according to accepted guidelines for organization and were not written in an arbitrary fashion by authors. This may be because standard articles were published after a peer-review process to ensure the quality of the text; similarly, thesis abstracts are guided by professors in the process of advising writers in their writing and defense of their theses.

4.2.2 Common Move Sequences Found in both Corpora

However, some move sequences were found in both the standard and predatory corpora.

Five move sequences were found in both corpora. Two were found at the same frequency of occurrence: M1-M2-M3-M4-M5 (4%) and M1-M2/3-M3-M4-M5 (4%). The other move sequences occurred more frequently in the standard abstracts than in the predatory abstracts: M1-M2/3-M4-M5 (nine standard abstracts exhibit this sequence four time more often than the two abstracts in the predatory corpus), M1-M3-M4-M5 (four standard abstracts is two time more frequent than the two predatory abstracts), and M1-M3/2-M4-M5 (six standard abstracts is more frequent than the one predatory abstract).

The findings for common move sequences indicate that few predatory abstracts were written following the sequences used in the standard abstracts. Most of the abstracts in the predatory corpus differed from the standard and were unconventional. An obvious example is Pattern 9 in the predatory corpus (see Table 5), in which only Move 1 was found. None of the standard abstracts was written with only Move 1. The core function of the abstract is to provide a summary of the whole research paper (Derntl, 2014). An abstract giving only Move 1, 'Situating the research', fails to serve the core function of the research abstract in providing readers with all important information.

4.2.3 Non-Linearity in Move Sequences

Notably, 44 abstracts, or 88% of those in the standard journal corpus, sequenced moves in a linear pattern; this linear sequence was found in 30 abstracts (60%) of the abstracts in the predatory corpus, which is about one-fourth less frequently than in the standard journal corpus. The moves in most standard abstracts were arranged to give general information before giving more specific information. The example below shows that an abstract starting with Move 1, 'Situating the research', followed by more specific details about the research like Move 4, 'Summarizing the results', and Move 5 'Discussing the research'.

Example10: M1-M4-M5

The metabolism of endothelial cells during vessel sprouting remains poorly studied. Here we report that endothelial loss of CPT1A, a rate-limiting enzyme of fatty acid oxidation (FAO), causes vascular sprouting defects due to impaired proliferation, not migration, of human and murine endothelial cells. Reduction of FAO in endothelial cells did not cause energy depletion or disturb redox homeostasis, but impaired de novo nucleotide synthesis for DNA replication. Isotope labelling studies in control endothelial cells showed that fatty acid carbons substantially replenished the Krebs cycle, and were incorporated into aspartate (a nucleotide precursor), uridine monophosphate (a precursor of pyrimidine nucleoside triphosphates) and DNA. CPT1A silencing *reduced these processes and depleted endothelial cell stores of aspartate and deoxyribonucleoside triphosphates. Acetate (metabolized to acetyl-CoA, thereby substituting for the depleted FAO derived acetyl-CoA) or a nucleoside mix rescued the phenotype of CPT1A-silenced endothelial cells. Finally, CPT1 blockade inhibited pathological ocular angiogenesis in mice, suggesting a novel strategy for blocking angiogenesis. [SA47]*

In contrast, the writers in predatory journals often wrote abstracts without the normal general-specific arrangement of information in a linear pattern; for example, they began their abstract with Move 2, 'Presenting the research', and shifted to Move 1, 'Situating the research'. This is illustrated by the example below.

Example 11: M2-M1-M3/2-M3-M4-M3

The objective of this study is to highlight the effect of an abandoned abattoir effluent on the underground water and to suggest the possible ways of controlling abattoir effluent effect on the ground water. The problem of getting quality water for domestic purposes is increasing as untreated effluents are discharged into surface water which percolates into underground water. The impact of effluent from Mokwa abattoir in Mokwa, Niger state on the physical and chemical parameters of underground water qualities was investigated. Samples were collected at different period of time of the day and analyzed using the AOAC analytical method of 2005. The assessment of underground water parameters shows that pH, 7.2, 6.9, and 7.1, nitrogen (mgL-1), 33.44, 29.48 and 33.0, total hardness (mgL-1), 62, 40 and 48, and phosphate as phosphorus (mgL-1), 0.06, 0.01 and 0.025, electrical conductivity (uScm-1) was 120, 450 and 450, total dissolved solids (mgL-1), 110, 225, and 225, temperature (°C), 27.2, 29.4 and 29.5, suspended solids (mgL-1), 0, 3.0 and 0, turbidity (NTU), 0, 1.0 and 0, 0, 0 and 0. The World Health Organization (WHO) standard and the Nigerian Water Drinking Standard were used as a standard for comparison of these studies. [PA39]

The finding of a non-linear sequence for moves in the predatory corpus is also in contrast to the findings of Pho (2008), who reported that Move 1, 'Situating the research, normally comes after Move 2, 'Presenting the research'. In addition, according to American Psychological Association (2010), an abstract is regarded as the most important paragraph in a research article and its information should be arranged by problem, method, findings, and conclusion in that order. This indicates that the authors of the predatory abstracts did not arrange the information systematically. Writers of articles in the predatory corpus often gave specific details before providing general information. This kind of abstract in predatory journals can make it difficult for readers to understand and prevent the reader from reading the abstract smoothly.

5. Conclusion

The aims of the present study were to compare moves and move sequences in scientific abstracts in standard and predatory journals. The study reveals that all five moves occurred in both corpora. In addition, standard abstracts exhibited a lower number of move sequences than the predatory corpus.

The five moves found in the standard corpus occurred at least 60% of the time; however Move 1, 'Situating the research', was found in less than 60% of the abstracts in the predatory corpus. Moreover, Move 4, 'Summarizing the results' was found in all 50 standard abstracts; some abstracts in the predatory corpus lacked this move. In addition, Move 5 occurred frequently in the standard corpus, while the writers in predatory journals omitted this move in 36% of the abstracts. These unconventional abstracts in predatory journals seem to lack some important information.

The findings for sequence of moves show that more varied sequences of moves occurred in the predatory corpus than in the standard corpus. This indicates conformity to accepted norms in the abstracts in standard journals; the writers in predatory journals are more arbitrary in organizing their abstracts. Furthermore, the findings also reveal that five move sequences were found in both corpora. However, most of these move sequences occurred more frequently in the standard corpus. In addition, non-linear move sequences were also found more frequently in the predatory corpus. This indicates consistency and systemacity in the abstracts in standard journals. In contrast, the writers of articles in predatory journals are more arbitrary and unconventional in writing their abstracts.

These findings, then, can serve as a guideline for scientists, especially for novices or inexperienced writers who need to write a research abstract in English because the present results demonstrate what information should be included through an the investigation of the corpus from Nature, which is considerated as a standard journal or peer-reviewed journal. The finding in this study also provides guidance on the arrangement of abstracts and shows scientists what the position of particular information should be.

In addition, this study also shows the differences between abstracts in a standard journal and a predatory journal in terms of moves found in the texts and the sequence of moves. This shows unconventional organizational patterns for organizing the information in the texts; for example, the predatory abstract which contains only information for Move 1, 'Situating the research', and the arrangement in nonlinear sequences of information in most predatory abstracts which might make it difficult for a reader to comprehend the overall idea of the research paper. This brings up the question of how a predatory journal reviews or scrutinizes papers before publishing them. Thus doubts about the process of the publication of predatory journal should raise awareness on the part of readers and writers in selecting reading sources and avoiding publishing their papers in predatory journals. In addition, the findings also explore the characteristics of the structure of the abstract in predatory journals (various patterns and non-linear abstracts), which can be used as a model for detecting questionable abstracts while reading.

6. Limitations and Recommendations for the Further Study

This section addresses limitations and recommendations for further study in move analysis in abstracts.

First, this present study was limited to an investigation of the abstract section of research articles. Thus, future research should extend to an investigation of other sections of research articles, such the introduction, methodology, literature review, results, and discussion. A broader corpus will allow the exploration of the organization of the whole research article, not just the abstract section.

Moreover, the present study just explored the main moves and sequence of moves in the abstract section. The researcher did not study other language features. Future study is recommended to identify language features such as voice, sentence structure, and tense, which are used to convey the communicative purpose of the sentences.

The research included only the corpora of abstracts from one area, namely scientific abstracts. Further study is suggested to compare the organization of research abstracts in various disciplines such as business and economics and mathematics and engineering. This would reveal the characteristics of standard and predatory journals in other disciplines in terms of abstract organization.

The methodology and findings of this present study would be applicable for other researchers who conduct research in a similar context. Nevertheless, future researchers should adapt some methods to make them more suitable to their own situation. For example, in the investigation of moves in introduction sections, a researcher should use Swales model (1990) rather than relying on Santos (1996), which is a model for moves in the abstract.

To conclude, future move analyses of academic articles should consider these three recommendations: studying other sections of research articles, exploring language features, comparing articles from different disciplines, and critically apply and implement the methods and findings of this study.

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