A COMPARATIVE STUDY OF MOVES IN ABSTRACTS OF LABORATORY ANIMAL REVIEW ARTICLES AND CELL BIOLOGY RESEARCH ARTICLES

CHANIPORN BHOOMANEE

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Chaniporn Bhoomanee

Miss. Chaniporn Bhoomanee
Candidate

Songsri S.

Assoc. Prof. Songsri Soranastaporn,
Ph.D. (Educational Administration and Foundation)
Major advisor

Natthapong

Lect. Natthapong Chanyoo,
Ph.D. (Instruction and Learning)
Co-advisor

Lect. Yuwadee Tirataradol,
Ph.D. (Curriculum and Instruction)
Co-advisor

Prof. Patcharee Lertrit,
M.D. (Biochemistry)
Dean
Faculty of Graduate Studies
Mahidol University

W. Puntai

Asst. Prof. Wiwat Puntai,
Ph.D. (Information Studies)
Program Director
Master of Arts Program in Applied Linguistics
Faculty of Liberal Arts
Mahidol University

Thesis
entitled

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on
May 30, 2016

Chaniporn Bhoomanee
.....
Miss Chaniporn Bhoomanee
Candidate

Sompratana Ratanakul
.....
Lect. Sompratana Ratanakul,
Ph.D. (English Language and Applied Linguistics)
Chair

Songsri S.
.....
Assoc. Prof. Songsri Soranastaporn,
Ph.D. (Educational Administration and Foundation)
Member

.....
Lect. Yuwadee Tirataradol,
Ph.D. (Curriculum and Instruction)
Member

Natthapong
.....
Lect. Natthapong Chanyoo,
Ph.D. (Instruction and Learning)
Member

.....
Prof. Patcharee Lertrit,
M.D. Ph.D. (Biochemistry)
Dean
Faculty of Graduate Studies
Mahidol University

.....
Asst. Prof. Aphilak Kasempholkoon,
Ph.D. Program in Thai (Literature)
Dean
Faculty of Liberal Arts
Mahidol University

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Chaniporn Bhoomanee

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CHANIPORN BHOOMANEE 5737218 LAAL / M

M.A. (APPLIED LINGUISTICS)

THESIS ADVISORY COMMITTEE: SONGSRI SORANASTAPORN, Ph.D., NATTHAPONG CHANYOO, Ph.D., YUWADEE TIRATARADOL, Ph.D.

ABSTRACT

The objectives of this study were: 1) to investigate the frequency and the sequence of moves in the abstracts of animal review articles in Institute for Laboratory Animal Research Journal (ILAR), 2) to investigate the frequency and the sequence of moves in the abstracts of research articles in Journal of Cell Biology (JCB), 3) to compare the frequency and the sequence of moves in abstracts between laboratory animal review article and cell biology research article, and 4) to investigate the language uses of the highest-frequency move found in the abstracts of laboratory animal review articles and cell biology research articles in terms of verb choices, tenses, voices, and types of sentence. The analytical framework used in this study based on Taddio et al. (1994) who proposed eight moves in the research article abstracts: purpose, research design, setting, subjects, intervention, measurement, results, and conclusion.

This study consisted of two corpora collected from ILAR and JCB published in 2012-2014. An entire corpus comprised 100 abstracts selected by using a stratified random sampling and simple random sampling (50 laboratory animal review articles and 50 cell biology research articles). Data analysis composed of three steps: 1) move identification, 2) inter-rater reliability assessment, and 3) comparison of move analysis of two corpora. Three inter-raters analyzed the dataset reliability, and Fleiss' kappa reliability was to measure the agreement of the raters. The statistics used in this study were frequency and percentage.

The results revealed that there were nine moves occurring in the abstracts of ILAR, and seven moves appearing in the abstracts of JCB. Specially, this study found a high frequency of new move (background: MB), which differed from Taddio et al. (1994)'s framework. In ILAR corpus, there were three high-frequency moves: MB (94%), M1 (82%), and M8 (54%). In contrast, JCB corpus composed of four high-frequency moves: MB (98%), M8 (96%), M7 (94%), and M1 (60%). Remaining moves occurred in less than 20% of move occurrences. In the case of move sequences, there were ten patterns of moves sequences in ILAR abstracts, while the JCB corpus found six patterns of move sequences. The most frequently used language forms were: finite verbs, present tense, the active voice, and simple sentences to write background sentences.

KEY WORDS: MOVE ANALYSIS / REVIEW ARTICLE / RESEARCH ARTICLE / ABSTRACT / LABORATORY ANIMAL / CELL BIOLOGY

180 pages

การศึกษาเปรียบเทียบอัตถภาคในบทคัดย่อของบทความปริทัศน์ด้านสัตว์ทดลองและบทความวิจัยด้านชีววิทยาของเซลล์
A COMPARATIVE STUDY OF MOVES IN ABSTRACTS OF LABORATORY ANIMAL REVIEW ARTICLES AND CELL BIOLOGY RESEARCH ARTICLES

ชนิภรณ์ ภู่มณี 5737218 LAAL / M

ศศ.ม. (ภาษาศาสตร์ประยุกต์)

คณะกรรมการที่ปรึกษาวิทยานิพนธ์: ทรงศรี สรณสถาพร, Ph.D., ณัฏฐพงศ์ จันทร์อยู่, Ph.D., ยุวดี ถิรธราดล, Ph.D.

บทคัดย่อ

วัตถุประสงค์ของงานวิจัยนี้คือ 1) เพื่อศึกษาความถี่และการเรียงลำดับของอัตถภาคบทคัดย่อของบทความปริทัศน์ในวารสารสัตว์ทดลอง *(ILAR)* 2) เพื่อศึกษาความถี่และการเรียงลำดับของอัตถภาคบทคัดย่อของบทความวิจัยในวารสารชีววิทยาของเซลล์ *(JCB)* 3) เพื่อเปรียบเทียบความถี่และการเรียงลำดับของอัตถภาคบทคัดย่อระหว่างบทความปริทัศน์ด้านสัตว์ทดลองและบทความวิจัยด้านชีววิทยาของเซลล์ และ 4) เพื่อศึกษาการใช้ภาษาของอัตถภาคที่พบมากที่สุดในหัวข้อคำกริยา (verb) กาล (tenses) วาจก (voice) และ ประเภทของประโยค (types of sentence) การศึกษานี้นำทฤษฎีการเรียงลำดับอัตถภาคของ Taddio และคณะ (1994) ใช้วิเคราะห์ข้อมูลซึ่งประกอบด้วย 8 อัตถภาค ได้แก่ วัตถุประสงค์ การออกแบบการวิจัย บริบท ตัวอย่าง การทดลอง การวัดผล ผลการวิจัย และข้อสรุปผลการวิจัย

การศึกษาครั้งนี้ศึกษาข้อมูลจากการพัฒนาคลังข้อมูลจาก 2 แหล่งข้อมูล ได้แก่ วารสาร *ILAR* และวารสาร *JCB* ตีพิมพ์ในปี ค.ศ. 2012-2014 คลังข้อมูลประกอบด้วยบทคัดย่อ 100 ฉบับ ซึ่งได้มาจากการสุ่มแบบแบ่งชั้นและการสุ่มแบบง่าย (บทคัดย่อของบทความปริทัศน์ด้านสัตว์ทดลอง 50 ฉบับ และบทคัดย่อของบทความวิจัยด้านชีววิทยาของเซลล์ 50 ฉบับ) การวิเคราะห์ข้อมูลประกอบด้วย 3 ขั้นตอนคือ 1) การกำหนดอัตถภาค 2) การตรวจสอบความเชื่อมั่นของผู้ตรวจสอบ และ 3) การเปรียบเทียบการวิเคราะห์อัตถภาคระหว่าง 2 คลังข้อมูล โดยมีผู้ตรวจสอบ 3 ท่าน ในการวิเคราะห์ความน่าเชื่อถือของคลังข้อมูล รวมทั้งการใช้สถิติ Fleiss's kappa เพื่อวัดความสอดคล้องระหว่างผู้ตรวจสอบ สถิติที่ใช้ในการศึกษาครั้งนี้ คือ ความถี่ และ ร้อยละ

ผลการวิจัยพบว่า บทคัดย่อของบทความปริทัศน์ด้านสัตว์ทดลองประกอบด้วย 9 อัตถภาค ในขณะที่บทคัดย่อของบทความวิจัยด้านชีววิทยาของเซลล์ประกอบด้วย 7 อัตถภาค โดยเฉพาะอย่างยิ่ง การศึกษานี้พบอัตถภาคใหม่ที่มีความถี่สูง (อัตถภาคข้อมูลภูมิหลัง: Move Background) ซึ่งต่างจากทฤษฎีของ Taddio และคณะ (1994) คลังข้อมูลสัตว์ทดลองพบอัตถภาคที่มีความถี่สูงจำนวน 3 อัตถภาค คือ ข้อมูลภูมิหลัง (ร้อยละ94) วัตถุประสงค์ (ร้อยละ 82) และข้อสรุปผลการวิจัย (ร้อยละ 54) ในขณะที่คลังข้อมูลด้านชีววิทยาของเซลล์พบอัตถภาคที่มีความถี่สูงจำนวน 4 อัตถภาค คือ ข้อมูลภูมิหลัง (ร้อยละ 98) ข้อสรุปผลการวิจัย (ร้อยละ96) ผลการวิจัย (ร้อยละ94) และ วัตถุประสงค์ (ร้อยละ60) โดยอัตถภาคอื่น ๆ พบน้อยกว่าร้อยละ 20 ของการปรากฏอัตถภาค คลังข้อมูลสัตว์ทดลองมีรูปแบบการเรียงลำดับอัตถภาค 10 รูปแบบ ในขณะที่คลังข้อมูลชีววิทยาของเซลล์มีเพียง 6 รูปแบบ การใช้ภาษาของอัตถภาคข้อมูลภูมิหลังที่พบมากที่สุด ได้แก่ ปัจจุบันกาล (present tense) กริยาแท้ (finite verb) ในรูปของกรรตุวาจก (active voice) และประเภทเอกรรถประโยค (Simple sentence)

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CHAPTER I
INTRODUCTION

English is the language of education, which researchers and students use to communicate for their studies. To gain new knowledge and information, researchers and students need to use English, effectively. This study focuses on the use of English, especially English writing for researchers and students. To understand the study, background of the study, rationale of the study, statement of problems, purpose of the study, significance of the study, limitation of the study, and definition of terms are described as follows.

1.1 Background of the Study

At the present time, English is acknowledged as a working language in communication, business, and education. It is the most common foreign language that people from different countries typically use to communicate. Regarding business, companies tend to hire professional staff who are good at English. English is essential and has an influence to various fields; especially, the educational fields where research and studies normally are written in English. Obviously, English is a significant language, especially academic field.

Firstly, English has become a global language that has been ever more significant in the modern world, especially in the fields of medicine, technology and business (Williams, 1996; Kaewphanngam, 2002; Martin, 2003; Sereebenjapol, 2003; Fuertes-Olivera, 2007). English is recognized as the main tool for acquiring any knowledge from various sources which are produced in English. Furthermore, English is needed to understand instructional manuals, and for professions such as doctors, lawyers, and scientists (Paltridge & Starfield, 2014). As a result, English has been used as a basic tool in order to explore new knowledge from different learning sources (Kaotsombut, 2003). Academically, English has been increasingly used in advanced

educational communication by writing and speaking (Kanoksilapatham, 2013). In particular, all academic texts must be written in English such as academic articles and dissertations. As a result, English is seen as an instrument of people who need to learn and work.

English is significant in the academic field, especially graduate students and researchers in the field of science. In general, approximately 80% of all the journals indexed in Scopus are published in English; therefore, English is compared as the language of the scientific community (Tardy, 2004). Moreover, English is considered as the universal language of science because of political, historical, and economic factors which preferred English over other languages such as Russian, Chinese, German, French, or Spanish (Kirchik, Gingras, & Larivière, 2012). Therefore, English as a scientific language is crucial for students and researchers in the scientific field in order to publish their own articles in English. In the present, based on global academic competition, the pressure to publish internationally in any recognized journals is continuously increasing, and such research articles should be well organized and written in English (Martin-Martin & Burgess, 2004). To publish articles with any journal or proceeding, researchers need to submit their English abstracts. Accordingly, English abstracts are usually required although articles are first published in other languages, (Lorés, 2004). Among all academic written texts, English abstract is a crucial communication among scholars and researchers across the academic disciplines (Kanoksilapatham, 2013).

Abstracts are needed to write in English in order to publish with the articles. English abstracts are essential part of the paper; it is similar to a brief summary of the whole article in order to help the readers decide whether to read the rest of the article. English abstracts usually come along with the articles in any language because the abstract is a summary of data in the article, and English language is the international language for everyone's communication. Similarly, The American Psychological Association (2010) defined the abstract as 'a brief, comprehensive summary of the contents of an article'. Moreover, when the researcher searches the website of e-journals, most journals inform in the page of submission information that English abstracts are requested along with the articles although the articles are written in the first language. For example, the journal of the Faculty of Engineering and

Architecture of Gazi University in Turkey requested English abstracts although the articles would be published in the Turkish language. The journal of Annales Francaises d Anesthesie et de Reanimation in France also published English abstracts with articles in any language (Reuthers, 2015). The article abstracts often determine the acceptance or rejection of an article for conferences (Lorés, 2004; Swales & Feaks, 2009). It can be explained that some journals may assess the quality of articles through the abstracts although the abstracts contain the quality of contents, the use of English may not be effective. Consequently, the researchers gain attention to writing of English abstracts because they need to publish the abstracts for their academic research.

To sum up, the most used language in the articles is English in order for global publication, including abstracts. The abstract of journal articles is one type of academic text which is published with the articles. The abstract is a sub-genre in the genre of the research articles (Biber, Conrad, & Upton, 2007). According to the submission information of journals, journals call for English abstracts along with research articles although the articles may not be published in English.

1.2 Rationale of the Study

To study on move analysis, there are three reasons related to the abstracts of review article and research article, laboratory animal and cell biology, and the organization of text.

An abstract is important for two reasons. First, for international conferences, researchers who want to present or publish their studies in the conference proceedings, the abstracts are required in the initial selection process. If the researchers write their abstracts well, the chance for having their papers accepted in the conference is high. For journals, the researchers have to submit the abstract with the article because the abstract is one crucial part of any article submitted by the researcher or the author.. Moreover, researchers, students, and scholars in the field of science receive information from other available abstracts to update the current knowledge and share new achievements. Likewise, the abstracts are recognized to be an effective means of saving time (Cross & Oppenheim, 2006; Swales & Feaks, 2009;

Kanoksilphatham, 2013). Obviously, the abstracts have been important for the researchers, authors, students, scholars and other readers in terms of writing and reading the articles. The researcher must study the abstracts in order to be helpful for the researchers and students to write their abstracts and learn how abstracts in science are organized.

The current study focused on laboratory animal and cell biology. Both fields are subgroups of science. They are in the area of biochemistry which cover resources on general biochemistry and molecular biology topics such as proteins, carbohydrates, nucleic acids, lipids, toxic substances, genes, drugs, and other chemical or molecular constituents of cells, microbes, higher plants, animals, and humans (SCImago, 2007). To publish the articles in the journals of laboratory animal and cell biology fields, researchers in both fields have to study and cite the source of articles in their research. Therefore, studies in both fields are important for the researchers to learn and find the information for their research. In addition, based on searching via e-database of Mahidol University, there is no research conducted on move analysis in both fields. Therefore, this study needs to contribute to the elimination of a gap in the literature by studying the abstracts in the fields of laboratory and cell biology.

Moreover, this study focused on the abstracts in two types of articles: a review article and a research article. Review articles are summaries of other research by critiquing, which contain introduction and background, body, and conclusion (American Psychological Association, 2010). Research articles are essays related to the original research written by the respective researchers and consist of introduction, methodology, results and discussion (Swales, 2005). Mainly, the types of articles in the fields of laboratory animal and cell biology are review articles and research articles, which have different features in terms of organization. It is interesting to speculate whether any difference exist between the two types of articles. In addition, no research was conducted by comparison of review articles and research articles. This study can be conducted to present the difference of abstracts between review articles and research articles.

This study focused on moves (that is, organization of the text) because the study on move analysis provides information on structure or organization of the text. The study of moves benefits researchers and students to unpack the organization the

text while reading and to use the pattern as a guideline when they want to write their own articles. In this study, moves were conducted in terms of move frequencies and move sequencing. Moves sequencing can show the order of moves occurred in the text. It can help the researchers understand each genre in linguistic form because the difference of each genre can lead to the difference of organization. This study needs to conduct on moves in order to provide the organization of abstracts as a guideline for writing their abstracts.

Finally, the language uses of abstracts are important for this study because its study provides the features of abstract writing in English. It is useful for researchers and students to know which language features of abstracts are used, and use them as an example to write the abstracts of review articles and research articles in both fields. This study needs to explore the language uses in terms of verb choices, tenses, voices, and types of sentences in order to provide the language features of abstract writing.

In summary, this current study aimed to investigate the organization of abstracts of review articles and research articles in the fields of laboratory animal and cell biology in order to show how the abstracts in both fields differ.

1.3 Statement of Problems

The researcher interviewed the director of the National Laboratory Animals, Mahidol University on March 20, 2015, and she said that the researchers in this field have difficulties in using the English language. For example, the researchers do not know how to write the academic articles or texts in English effectively because they have limited capacity in writing.

Concerning their difficulties, the laboratory animal researchers lack English writing and reading skills. That is to say, they can conduct their researches, but they cannot write and read the academic article in English effectively. It can be said that knowing English is the foundation for the researcher to produce a good paper. Therefore, few research articles in the field of laboratory animal were written in English by Thai researchers.

Apart from having mastered the use of language, organization of the text is another important feature of the text that the writers have to develop. Review articles

typically comprise four parts: abstract, introduction and background, body, and conclusion. In addition, research articles comprise five parts: abstract, introduction, methodology, results, and discussion. There are parts required in both types of articles: abstract and introduction. Among these required parts, the abstract is the most important feature for both article types. It is a brief summary of the whole article and provides the main contents of the article for the readers. It is a basic text which all researchers have to write. This may be difficult for researchers and students in the laboratory animal field to write texts and articles.

It is clear that no study of move analysis related to English writing of abstracts in the review articles and research articles conducted in the field of laboratory animal and cell biology. The researcher searched via website of University library:*http://www.li.mahidol.ac.th.ejournal2014.mahidal.ac.th/eresource/databases.html* about the studies conducted on move analysis in abstracts by using keywords: "move analysis", "research article", "review article", "abstracts", "laboratory animal" and "cell biology" via e-database of Mahidol University. According to the findings, no results came out in the fields of laboratory animal and cell biology. However, corpus-based studies on move analysis of abstracts in research articles have been conducted in some disciplines such as conversation biology and wildlife behavior (Samraj, 2005), social science (Kafes, 2012), linguistics and educational technology (Pho, 2008), protozoology (Cross & Oppenhiem, 2006), and civil engineering (Kanoksilphatham, 2013).

In summary, it is clear that the researchers in laboratory animal and cell biology have difficulties in the use of English for publications. The researcher was searching for any relevant studies using corpus-based on the move analysis in the field but found no research of such technique. Thus, this study will help Thai researchers in laboratory animal and cell biology to fill the gap of knowledge in the use of English in these fields by comparing frequency and sequence of moves in abstracts of laboratory animal review articles and cell biology research articles.

1.4 Purposes of the Study

Laboratory animal and cell biology are the branches of science studied primarily in the biology. Thai researchers find it difficult to write English abstracts for publishing the articles on laboratory animal and cell biology fields in scientific journals. The knowledge of move analysis in abstracts is essential for writing English abstracts in both fields. Thus, this study has the following purposes:

1. To investigate the frequency and the sequence of moves in the abstracts of animal review articles in Institute for Laboratory Animal Research Journal (ILAR).

2. To investigate the frequency and the sequence of moves in the abstracts of research articles in Journal of Cell Biology (JCB).

3. To compare the frequency and the sequence of moves in abstracts between laboratory animal review article and cell biology research article.

4. To investigate the language uses of the highest-frequency move found in the abstracts of laboratory animal review articles and cell biology research articles in terms of verb choices, tenses, voices, and types of sentence.

1.5 Research Questions

This current study explores the following questions:

1. What were the frequency and the sequence of moves in the abstracts of laboratory animal review articles from ILAR?

2. What were the frequency and the sequence of moves in the abstracts of cell biology research articles from JCB?

3. What were the similarities and differences of the frequency and the sequence of moves in the abstracts between laboratory animal review articles and cell biology research articles?

4. What were the language uses of the highest-frequency move found in the abstracts of laboratory animal review articles and cell biology research articles in terms of verb choices, tenses, voices, and types of sentence?

1.6 Conceptual Framework

This study applied the framework of Taddio et al. (1994) to explore the frequency and the sequence of moves in the abstracts from two journals: ILAR and JCB. Both journals were compared concerning the frequency and the sequence of moves as the following Figure 1.1.

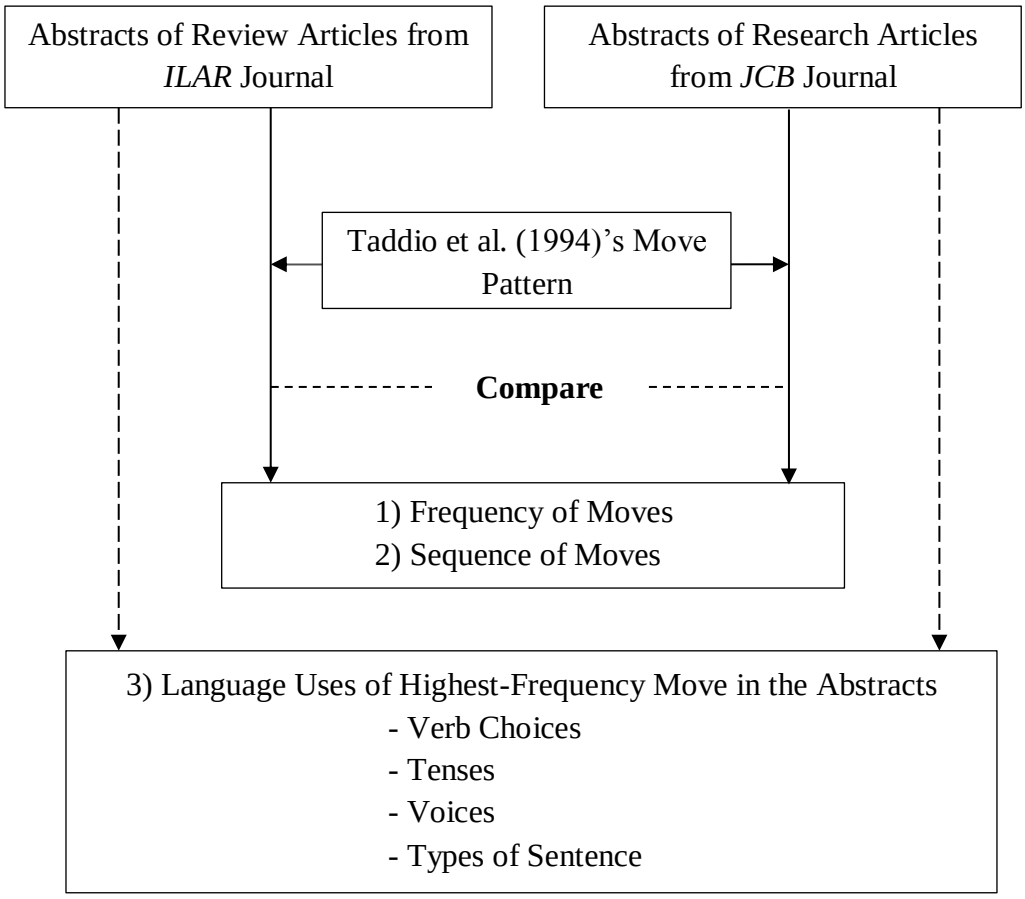


Figure1.1 Conceptual Framework of the Study

1.7 Significance of the Study

The current study was undertaken to investigate on the organization in the article abstract section of laboratory animal and cell biology based on move analysis approach. Move analysis significantly contributes to a clearer comprehending of how abstracts in laboratory animal review articles and cell biology research articles were

constructed. In addition, this study also serves as a guideline for further studies in both fields. It is expected that the finding of this study is an information source which can helpful in the following ways:

1. Teachers can gain an accurate picture of how information is usually organized in the abstracts of laboratory animal review articles and cell biology research articles. They use this information as authentic material to teach science students and to write abstracts.

2. Researchers, graduate students, and novice writers who wish to publish their research articles in the field of laboratory animal and cell biology may find the outcome of this study for writing their own research abstracts.

3. Readers who need to access information in science may use the results of this study for comprehending the contents of their interested articles.

1.8 Limitation of the Study

Three limitations related to this study.

1. The article abstracts used in this study were in Institute for Laboratory Animal Research Journal (ILAR) and Journal of Cell Biology JCB e-journals in the periods of 2012-2014.

2. Fifty abstracts of laboratory animal review articles and fifty abstracts of cell biology research articles were analyzed in this study.

3. The analytical framework of the organization of scientific article abstracts was on based on Taddio et al. (1994)'s abstract move patterns.

1.9 Definition of Terms

Review abstract is a brief summary of article which one or more authors sum up the current state of research on particular topic.

Research abstract is a brief summary of article which reports on the original research consisting of introduction, methods, results, and discussion.

Move refers to a segment of a text that performs a specific communicative function (Biber, Connor, & Upton, 2007).

Frequency of move refers to the number of occurrences of each move type in the corpus.

Sequence of move refers to the order of moves occurred in the abstracts.

Move analysis is to describe the texts by categorizing the units of various discourses in the texts based on their communicative purposes or rhetorical move (Biber, Connor, & Upton, 2007).

Corpus is a collection of language in the set of written and spoken texts, which have been designed for a specific purpose of linguistics (Hunston, 2002).

Corpus analysis is a study of texts focusing on its characteristic linguistic features which can dictate shared meaning e.g. academic vocabulary, syntax, semantic, pragmatic, discourse (Upton & Connor, 2001).

Genre refers to a category of texts with reference to a specific communicative function (Swales, 1990).

Genre analysis is the studies of language in any aspects of linguistics, which are based on the analysis of completed texts from variety (Swales, 1990).

Chapter Summary

Nowadays, English is recognized as an educational language. To acquire knowledge, researchers and students use English to communicate in listening, speaking, reading, and writing. English writing has been used to disseminate knowledge. For example, the researchers have to write articles to publish in journals. To publish the articles, in general, the authors have to write the articles with five sections: abstracts, introduction, methodology, results, and discussion. In addition, in order to join the conferences, the authors have to write the articles for conference, and to submit the abstract to the conference for review before presentation. The abstract is the basic text in every article. Not only the writing of abstracts in English but also the organization of abstracts is crucial, which the researchers should emphasize. Therefore, this study aimed to investigate how abstracts are organized in the fields of laboratory animal and cell biology.

CHAPTER II
LITERATURE REVIEW

This chapter reviews some literature and previous studies relevant to this study. For studying, an English language is an educational language for acquiring the knowledge, so the first part of this chapter provides importance of English. Next, because the subject of this study related to abstracts in the review articles and research articles, the remaining parts provide the information of articles and abstracts, and the concepts of corpus analysis and genre analysis, which are approaches covered in the study. Finally, because of the purposes of the study, move analysis is provided in terms of the concept, importance, methods for move analysis, as well as the framework used in this study. To see the overview of this chapter, six main parts are presented in Figure 2.1.

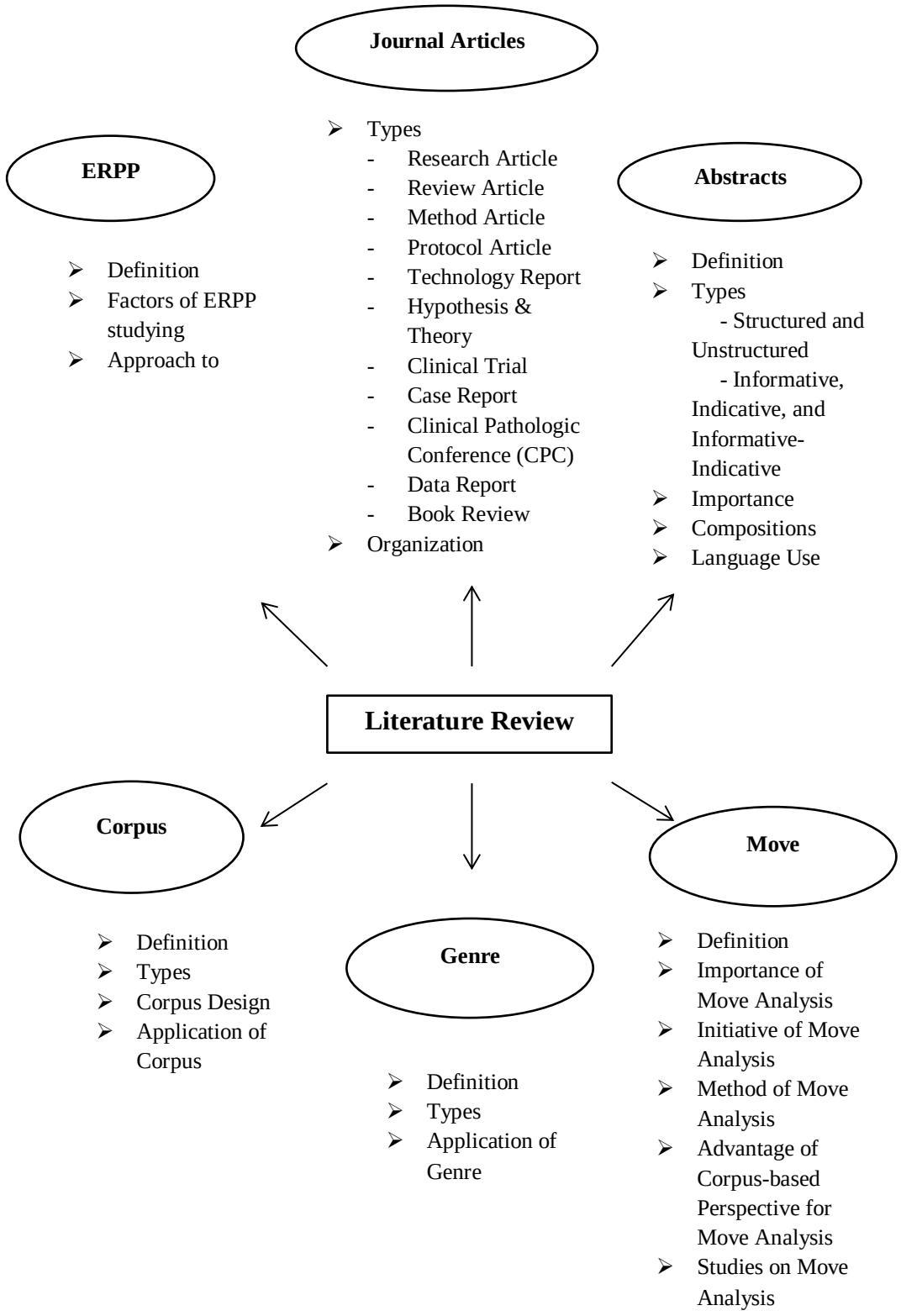


Figure 2.1 Overview of Literature Review

2.1 English for Research Publication Purposes

English for Research Publication Purposes (ERPP) has been one of the categories in the framework of English for Specific Purpose (ESP) (Paltridge & Starfield, 2014). At present, academic writing for research publication involves 5.5 million scholars, 2,000 publishers and 17,500 researches around the world, including higher education institutes (Flowerdew, 2013). Roughly 80% of all the journals indexed in Scopus are published in English (Tardy, 2004). As a result of the growing of an international scholarly publication, English is as a crucial language in the field of research. To provide background knowledge of ERPP, the definition, factors of creating the publishing phenomenon, and the approach to theory in ERPP are described as follows.

2.1.1 Definition of English for Research Publication Purposes (ERPP)

ERPP is defined in an issue of the *Journal of English for Academic Purposes* as follows:

English for Research Publication Purposes (ERPP) can be thought of as a branch of EAP addressing the concerns of professional researchers and post-graduate students who need to publish in peer-reviewed international journals. It is now almost a truism to say that the vast majority of these journals are published in English, and that this presents considerable challenges to users of English as an Additional Language (EAL), regardless of the field in which they work. While EAP programs in universities can address some of these needs in a general way, the real-life, specific issues for academics whose L1 is not English, wishing to publish in English are often broader and more complex.

(Cargill & Burgess, 2008, p.75 cited in Flowerdew, 2013)

2.1.2 Factors of Creating the Publishing Phenomenon

According to the handbook of English for Specific Purposes, there are five factors that influence publications in the academic field.

Firstly, there are now a number of research students and faculty members wishing to publish their works or studies because of the development of university education (Paltridge & Starfield, 2014). Secondly, students and researchers are supported by the Internet and ease of international travel or facilitated by the global

communication networks; as a result, universities can compete globally with each other in producing more and more research publications (Paltridge & Starfield, 2014). Thirdly, an international publication is becoming a requirement of master and doctoral's degree graduation (Paltridge & Starfield, 2014). In addition, English is now accepted as the international language in publishing research articles (Paltridge & Starfield, 2014). It is common to see that, in the Institute for Scientific Information (ISI), 95 percent of natural science journals and 90 percent of social science journals are all published in English (Curry & Lillis, 2010). In short, English is the language for communication in both students and researchers who wish to publish their academic texts worldwide. English for Research Publication Purposes (ERPP) is a crucial branch of English for Specific Purposes.

2.1.3 Approach to Theory in ERPP

Discourse analysis is one approach to the theory in ERPP. It is the study of language use in any aspect which occurs in any contexts including linguistic and forms analysis concerning the sentences in sequence, conversation, meeting, text, and interview (Schiffrin, Tannen & Hamilton, 2001). The analysis has been conducted under the labels of genre analysis, corpus-based discourse analysis, and contrastive rhetoric. There is a wide range of research relevant to ERPP. Most of them talk about the structure of the research article (RA), and it will be effective for ESP practitioners in any pedagogical intervention who are to undertake publication (Flowerdew, 2013). The research has been done in ESP to describe the genre of the RA in rhetorical and linguistic terms, especially RA that includes conference abstract, conference presentation, and letters (Paltridge & Starfield, 2014). On genre, research has shown how academic language is subject to systematic generic and disciplinary variation (e.g. Bhatia, 1993; Hyland, 2000; Swales, 1990, 2004). In addition, some research have focused on the parts of the RA such as abstracts (e.g. Hyland and Tse, 2005; Lorés, 2004; Santos, 1996), results sections (e.g.William, 1999; Kanoksilapatham, 2007), and discussion sections (e.g. Dudley-Evans, 1994; Holmes, 1997). A main focus of the research is on the structural patterns, and schematic structure that make up the text, and the research has also been done on lexical-grammar, explaining how the parts

(moves) are realized linguistically as well as the research on corpus-based discourse analysis.

In short, the Research Publication Purposes (ERPP) is one area of ESP which is useful for researchers and graduate students who need to publish in peer-reviewed international journals, which the researchers and students in various field interest to conduct with their researches. In addition, discourse analysis is one approach of ERPP, which can lead to knowledge of the language uses of texts in different contexts.

To sum up, according to research publication, researchers and students have to use English as the research language in order to disseminate their articles through journals or e-journals. Particularly, e-journals usually publish the articles in English. ERPP is a crucial area that the researchers should emphasize for the benefit of research publications. Related to ERPP, discourse analysis is an approach which can identify the differences of texts in diverse contexts.

2.2 Journal Article

At present, students and researchers are able to disseminate their academic articles via abundant journals. According to the website of the Journal Citation Reports, there are approximately 12,000 scholarly and technical journals and conference proceedings from more than 3,300 publishers in over 80 countries where articles are published in both science and social sciences (Reuters, 2015). To describe journal articles, the types of article and the organization of article are described below.

2.2.1 Types of Article

Based on the website of Frontiers in Neuroscience (Journal.frontiersin.org, 2015), there are eleven main types of articles for publishing in the journals. The most common articles found in the research conferences and journals are research article and review article. In addition, there are other types of articles: method article, protocol article, technology report, hypothesis & theory, clinical trial, case report, clinical pathologic conference (CPC), data reports, and book review.

a) Research Article

A research article is a type of written documents in forms of essays providing the overall information of a particular study which researchers or scientists have conducted (Ghebranious et al., 2010). The research article basically consists of four main sections including introduction, methodology, results, and discussion/ conclusion (Swale, 1990; Glasman-Deal, 2010). In research articles, the introductory section is written at the beginning of articles to orient readers' information of background, problems, relevant frameworks, previous studies and objectives of the study. Furthermore, the authors must describe methodology or how they conduct the research dealing with source of data, research instruments, and data analysis. Results are given in the third section to report research findings and these results are interpreted in the discussion. Finally, the research article is typically ended with the conclusion section in order to give a summary of the research with suggestions and implication for further studies.

b) Review Article

McMillan (2006) defined a review article as a critical synthesis of research in a particular topic that would be varied due to purpose and scope of writers. Generally, the review article's author not only concludes any previous studies that have been previously published, but also clarifies gaps, problems, and advantages and disadvantages. Moreover, the author suggests solutions coping with identified problems of the reviewed papers (American Psychological Association, 2010).

c) Method Article

A method article typically introduces a new method and a technique used in conducting the research of a particular field. The components of this kind of articles include three sections: 1) stating the objectives of a presented method and technique, 2) validating the reliability of methods with providing protocol and illustrating how the method or technique process, and 3) informing some limitations of that method (Journal.frontiersin.org, 2015). In addition, the research author must report some significant detail on how the method and technique is used effectively.

d) Protocol Article

Protocol articles function to provide all procedures for conducting the studies. As compare to the method article and original research, the protocol article

gives more specific detail on research methodology that has not been previously mentioned. Moreover, the information involving a description of protocol application, a timeframe for data collection, research tools, procedures as well as expected findings are included to enrich readers' comprehension.

e) Technology Report

Another kind of written document is a technology report. It usually proposes the fundamentally technical information of a new technology and/or software including its new application. Additionally, the technology reports assess the benefits and limitations of the approach.

f) Hypothesis & Theory

A hypothesis and theory article presents a new argument concerning the new topic or issue of the study; moreover, the hypothesis is based mainly on the established theories which might be proved by empirical data (Journal.frontiersin.org, 2015). To write theory article, the author provides a practical insight in a particular issue or topic including the knowledge for actually applying in explaining a studied phenomenon.

g) Clinical Trial

A clinical trial article normally mentions on issues related to the research design in terms of ethical consideration, study designs, measurements of consequences, as well as procedures of data analysis. The writers of the certain article may further present research findings, result interpretation and implications.

h) Case Report

A case report is an article to report on patients either humans or animals who participate in a clinical treatment, sudden diagnosis, and treatment outcomes for those in clinical practice and medical training (Journal.frontiersin.org, 2015). The author must give suggestion and provide a correct context used for the case including a case presentation of human patients and animal patients. In addition, the case reports may comprise of a description from laboratory investigations and diagnostic tests, an explanation for any discrepancy analysis, and a comment on the development of disease and treatment, and a short discussion of significance in each case.

i) Clinical Pathologic Conference (CPC)

A Clinical Pathologic Conference (CPC) article is produced to illustrate signs, symptoms, and diagnosis results of real case patients from medical practice which could serve as samples for teaching diagnosis (Journal.frontiersin.org, 2015). This particular article additionally shows historical and physical exam findings. Besides, the Clinical Pathologic Conference article may be served as a problem-based approach for in-depth understanding on a specific case.

j) Data Report

Data report generally describes sets of the research comprising of references or explanation of data collection and data analysis without establishing any new scientific insights (Journal.frontiersin.org, 2015). This report is required to be available to access publicly.

k) Book Review

A book review is an overview of highlighted content of a particular book. The book review generally discusses the contents and styles of a book in either agreement or disagreement perspectives. Especially, the discussion of the contents in relation to the benefits of community is also included in the book review.

In short, in order to disseminate the articles, there are abundant journals for publishing the articles which comprise a variety of types: research article, method article, protocol article, technology report, review article, theory article, clinical trial, case report, CPC article, data report, and book review.

2.2.2 Organization of Articles

The article can be organized based on the publication guidelines of each journal. This section will provide the organization of general articles and of review articles and research articles.

Generally, each article has four component parts: *introduction, methods, results,* and *discussion* (IMRD). The experimental research usually includes four sections: introduction, methodology, results, and discussion (Swales, 2005). The basic of IMRD is an eminently logical format which is used increasingly for other types of expository writing (Day & Gastel, 2012). Especially, the scientific articles usually choose the best choice of IMRD format. Day and Gastel (2012) proposed the

objectives of the IMRD format are: Introduction presents on problem, significance, and objective of the study, Methodology explains in terms of research instruments and research procedure used to conduct the research, Results presents on what have been discovered, and Discussion analyzes on the importance of findings including implications.

To provide more background of organization of a review article and a research article, this part will discuss the organization of the review article and the research article. In general, the research article includes four mandatory sections: introduction, methodology, results, and discussion (Swales, 2005). In contrast, the review article must contain two sections: introduction and background, body, and conclusion.

APA style specifies guidelines for the order of report sections between the research articles and review articles as showed in Table 2.1.

Table 2.1 Organization of Research Articles and Review Articles

Section	Review Article	Research Article
Title page	○	○
Abstract	○	○
Introduction and Background	●	●
Method	○	●
Results	○	●
Discussion	○	●
Conclusion	●	○
Reference	○	○

- ● Mandatory section
- ○ Optional section

(American Psychological Association, 2010)

From Table 2.1, the review article and the research article has introduction as a common section. This means that the introduction section is important for both types of articles.

In short, the research article consists of four main sections: introduction, methodology, results, and discussion, based on the findings of original research. In contrast, the review article has two main sections: introduction and background, and conclusion, which summarizes the details of issues in each field.

2.3 Abstract

An abstract is an essential part of academic papers which the authors have to write. It is a brief summary of the whole paper in order to help readers decide whether to read a paper or not, and research abstracts often determine the acceptance or rejection of an article for conferences (Swales, 1990; Lorés, 2004). Commonly, the articles are accepted on the basis of abstracts, which are called for by conference members (Craswell & Poore, 2012). The concept of basic information on abstract is reviewed, which consisting of definition of abstract, type of abstract, importance of abstracts, and compositions of abstracts.

2.3.1 Definition of Abstract

An abstract is a summary of articles or dissertations. It is the first part of any paper, and facilitates the readers for quickly considering objectives and significance of the study before deciding to further read the full paper. The abstract was defined and summarized by four researchers: Bhatia (1993), Hyland (2000), Lorés (2004) and Lester and Lester (2007) as follows:

Bhatia (1993) offered the definition of an abstract as: *"A description of factual summary of the much longer report, and is meant to give the reader an exact and concise knowledge of the full article"* (p. 78).

Hyland (2000) mentioned that an abstract refers to *"selective representation"* (p. 64). It represents the summary or report of essential parts of the full text.

Lorés (2004) also stated the abstract is a concise summary of research article.

Lester and Lester (2007) defined an abstract as a brief description that appears at the beginning of an article to help the readers decide to read or to avoid the article. The abstracts should include all necessary and primary information in the article.

In short, the abstract refers to a summary or informative synopsis of the whole paper which generally should have purpose, method, results, and conclusion. The abstract is a crucial part of academic papers which the authors have to write with the full papers.

2.3.2 Type of Abstract

Abstract can be classified into three categories according to Kaplan et al. (1994), Hartley (2002), and Swales and Feak (2009), which are described as follows.

Firstly, Kaplan et al. (1994) mentioned that abstracts can be separated into various types: journal article abstracts, thesis, and dissertation abstracts, conference abstracts or abstracts responding to '*call for paper*'. Each type of abstract has a distinct purpose and also different characteristics (Kaplan, 1994).

Secondly, abstracts can be divided into two types: structured abstracts and unstructured abstracts (Hartley, 2002). First, a structured abstract is divided into many sections with solid sub-headings like 'Background', 'Method', 'Results', and 'Conclusion'. The structured abstract became increasingly popular in medicine research journals. Second, an unstructured abstract is not divided into sections, and the format is not fixed. The examples of structured and unstructured abstract are shown as Table 2.2.

Table 2.2 Examples of Abstract Structure

Structured abstract	Unstructured abstract
Objective: Because of graft shortages, an experimental programme of organ donation after Maastricht 3-type circulatory death (M3) has been proposed by the French organ procurement organization (Agence de la biomedicine: ABM). The aim of the study was to estimate how many potential patients were eligible for an M3-type organ donation, amongst deceased patients who have had life-support withdrawn. **Patients and methods**: We conducted a retrospective study looking at the notes of deceased patients in a French general intensive care unit (ICU), where organ donation is arranged in DBD donors. **Results**: Over the year 2013, 1475 patients were admitted in ICU and 215 died. One hundred and one patients were brain-injured and 26 of them died following a decision to withdrawn life-support and without contraindication to organ donation. Among them, 2 patients (8%) met the criteria for the French M3-type organ donation protocol. A 12.5% increase in organ donation activity of our team and five organ transplantations could have been considered. **Conclusion:** If M3 organ donation is considered, a significant increase in transplantation would be expected.	Animal experiments are necessary for a better understanding of diseases and for developing new therapeutic strategies. The mouse (Mus musculus) is currently the most popular laboratory animal in biomedical research. Experimental procedures on animals often require anesthesia and/or analgesia to obtain adequate immobilization and to reduce stress or pain. Mice anesthesia is challenging for several reasons including the animals' size, metabolic rate, and the high risk of hypothermia and hypoglycemia. Moreover, anesthetic agents influence physiological parameters, further interfering with experimental results. Small animal imaging procedures are increasingly used in biomedical research both because the animals allow in vivo monitoring and because they are readily available for longitudinal and noninvasive studies as well as investigations into the evolution of diseases and the effects of new therapies. Anesthesia must adapt to the imaging technique, the procedure length, and the aim of the study. The purpose of this article is to review the existing literature on anesthetic protocols adopted in mice for molecular imaging studies and to report our experience.
(Brocas et al., 2014)	(Gargiulo et al., 2012)

Lastly, according to Swales and Feak (2009), abstracts can be divided into three categories: indicative abstracts, informative abstracts, and indicative-informative abstracts. First, indicative abstracts state the content of the full text in general, not in detail, and do not include the discussion and conclusion part. Second, informative abstracts state everything possible about full text in detail including the discussion and conclusion. Last, indicative-informative abstracts have all of the features of an abstract including the discussion and conclusion.

In short, abstracts can be divided into any types and categories according to the purposes of research types: research article, and thesis or dissertation. The researcher wanted to provide the background of abstracts in term of types of abstracts in order to increase the knowledge, but this study focused on the organization of abstracts in terms of move frequency and sequencing moves without considering types of abstracts.

2.3.3 Importance of Abstract

In the academic articles, abstracts serve as a tool for the readers for deciding whether to read further details in the articles. Abstract is very significant in the academic field because for publication, academic articles have to include abstracts. The importance of abstract is described as follows.

Commonly, an abstract is as a compact summary of a full report. Likewise, Lorés (2004) mentioned that the abstract is as a summary of work on the talk or paper, which can help the reader to quickly decide whether to attend the talk or read the full paper. Similar to Lester and Lester (2007), the abstract is the best way to ascertain if an essay or a book will serve specific needs of the reader. Moreover, it can help the reader to assess the content and reliability of the report before deciding to read, print and download the entire article (Hopewell, Eisinga, & Clarke, (2007). Thus, the abstract can save the reading time of the readers to determine whether the whole report is of sufficient interest or not (Cross & Oppenheim, 2006).

In short, the abstract is a guide to readers to save their time to read the whole papers, and a basic tool for them to capture the main content of the papers.

2.3.4 Compositions of Abstract

The abstract should not cover any information that is not present in the actual articles or papers. The information of abstracts should be consistent with information included in the body of the articles. APA style (2010) classified the organization in terms of information in the abstracts between research article and review article as below.

Table 2.3 Abstract Compositions between Research Article and Review Article

Abstract of Research Article	Abstract of Review Article
Purpose / problem investigated	Topic / purpose or thesis
Number, type, age, sex (or species) of participants	Types of source used
Method (materials used, basic procedure)	-
Major findings	Major findings
Conclusions and implications	Conclusion and implications

(American Psychological Association, 2010)

The abstracts are concise, self-explanatory, and specific, which include different compositions based on the types of articles.

2.3.5 Language Uses of Abstract Writing

To write an abstract, four features of linguistics are concerned, which are tenses, verbs, voices, and types of sentence.

a) Tenses

The Language use of abstract writing is one of research writing genres. To begin with “verb-tense”, Swales and Feak (1994) analyzed research articles and found that the sections of introduction and discussion used the present tense, while the past tense was used in the sections of methodology and results. Soranastaporn (2013) mentioned that the general abstracts were written in past tense in the sections of purpose, methodology, and results; however, the results can be written in the present form because use of simple present also to indicate research results that you believe to

be true and relevant to your present research (Joshi, 2013). McMillion (2012) proposed examples of the purpose sentences using simple tense in 'present', 'past, or 'future'. Swales and Feak (2012) explained that purpose sentences use the 'present' or 'past' verbs depending upon the different situations.

Using tense in scientific writing, Swales and Feak (2012) gave some advice about the use of various tenses in each section of paper as below.

-Abstract usually uses the **past tense**.

-Introduction usually uses the **present tense** because the introduction includes background information which is generally accepted as fact in a discipline. The author uses present tense to explain why the research is reporting is important.

-Methods usually use **past tense** to describe what was done; however, **present tense** can be used for diagrams and figures in order to explain what you did.

-Results use **past tense** to describe the results obtained by the researchers, and **present tense** can be used to refer to figures, tables, and graphs.

-Discussion uses **present tense** to explain significance of results, and **past tense** is used to summarize the findings, with **present tense** to interpret results.

-Conclusion can combine tenses to highlight past research and future directions. In conclusion of the report, the authors summarize the main findings and the major implications of the study, point out any implications, and offer suggestions for future research. To explain these, the authors can use a combination of tenses.

b) Verbs

In English, a verb can be divided into two main types: finite verb and non-finite verb. A finite verb is a form of verb which has a subject (expressed or implied) and can function as a root of an independent clause. The finite verb is a locus of grammatical information of person, gender, mood, number, aspect, tense, and voice, which cannot change its form to agree with the number of the subjects or persons (Tallerman, 2005). It begins with an infinitive or a participle, and cannot be combined with the subject to form the sentence (Azar, 2006).

In addition, modality is about speakers' and authors' attitude towards the world. Speakers and authors can express possibility, certainty, necessity, willingness, obligation, and ability by using modals (Carter, 2011). Likewise, a speaker can use modals to change the meaning of sentence, which described as below.

(1) Modals can be used to indicate the time when the situation occurred.

(2) Modals can be used to express what someone is capable of doing.

(3) Modals can be used to express that something is necessary, not optional.

(4) Modals can be used to express that the action is good or appropriate.

(5) Modals can be used to express that something is expected, likely, or follows correct guidelines.

(6) Modals can be used to indicate that something is an available choice, option, or possibility.

(7) Speakers use modals to express how certain they are of a statement.

(8) Modals are used in polite requests and suggestions.

(Ackles, 2003, pp. 36-51)

c) Voices

Voices can be divided into two types: active voice and passive voice. Linguistically, active voice is a fundamental sentence of English writing because the emphasis is on the performer, but passive voice is used when the subject is acted upon (Tallerman, 2005). In academic writing, the writers should avoid passive voice because active sentences are stronger and more interesting; however, passive voice can use in academic writing due to six reasons: stating generalization, avoiding blame, avoiding extra-long subjects, focusing attention on the important information, increasing coherence in writing English, and avoiding gendered pronouns (Ackles, 2003). In research articles, Swales and Feak (1994) mentioned that passive voice is also used in the section of methodology, but the passive voice was least used in the introduction section.

d) Types of Sentences

To write their abstracts or articles, researchers have to construct English sentences in the following four types: simple sentence, compound sentence, complex sentence, and compound-complex sentence (Cele-Murcia & Larsen-Freeman, 1983; Swales & Feak, 2012; Soranastaporn, 2013).

1. Simple sentence includes one independent clause.

"Cellular rearrangements in cranial mesenchyme <u>are</u> essential during neurulation for elevation of the neural folds."

(Sarkar & Zohn, 2012)

2. Compound sentence has two independent clauses which can be joined by a coordinating conjunction (such as "and," "for" and "but") or a semicolon.

"Specific activities have been linked to several subunits and adaptors, but the function of the majority of components has remained elusive."

(Raaijmakers, Tanenbaum & Medema, 2013)

3. Complex sentence contains one independent clause and one dependent clause which begin with subordinating conjunctions (such as "which" and "that").

"These roles establish different baselines for animal use that require substantially different ethical considerations."

(Sikes & Paul, 2013)

4. Compound-complex sentence contains two independent clauses and at least one dependent clause.

"Mice imaging procedures are increasingly used in preclinical research because they allow in vivo monitoring, and they are readily available for longitudinal and noninvasive studies as well as investigations into the evolution of diseases and the effects of new therapies."

(Gargiulo et al., 2012)

To sum up, the abstract is an essential part of articles that the researchers and students have to write, and is a crucial process in article publication because journal articles have abstracts. A well written abstract is very important for researchers and students who wish to publish their articles in international journals.

2.4 Corpus Analysis

A corpus-based study has become a main focus of research in linguistic field because it can show the phenomenon of language in both written and spoken texts. It also helps the readers to read texts, effectively. This section provides the background of corpus analysis, which consists of the definition of corpus, types of corpus, corpus design, and application of corpus.

2.4.1 Definition of Corpus

The word of *"corpus"* is a collection of text that has been gathered for a particular reason. Before discussing the basic principles of corpus linguistics, the definitions of corpus in different aspects are discussed.

Concerning the definitions of corpus, it concerns form and purpose (Hunston, 2002). He also defined the corpus as a collection of language examples in terms of a few sentence or a set of written texts which are used in the corpus for linguistic study. Moreover, to establish a corpus, the texts can be encoded electronically in order to allow the research findings and reveal the patterns and frequency information in the field of linguistics (Baker, 2006). Likewise, Cheng (2012) also described a corpus as "*a collection of text that has been compiled for a particular reason*" (p.3). Obviously, the corpus is a collection of texts depended on a set of criteria, and it purposes to be representative. It is typically described in terms of number of the words that they contained. It is usually studied and become larger due to the ready available electronic texts and power computing resources.

In short, it can be explained that the "corpus" is a collection of language texts including spoken and written texts based on the set of designed criteria.

2.4.2 Type of Corpus

The corpus is usually designed for a specific purpose in linguistic field. According to Hunston (2002), the corpus is divided into eight types as follows.

a) Specialized Corpus

The specialized corpus is defined as a corpus of texts in specific types: geography textbooks, newspaper editorials, academic articles, lectures, conversations, and written essay. The specialized corpus aims to be representative of the given type of text. It is also used to explore a specific type of language.

b) Generalized Corpus

The generalized corpus is as a text corpus in various types. In addition, it is a board discipline of language use. It comprises written and spoken language, and can contain some texts produced from one or more countries. The generalized corpus is used to produce the reference materials of language learning and translation.

c) Comparable Corpus

The comparable corpus stands for a collection of two or more corpora in various languages; moreover, it can be useful for learners and translators in order to identify the dissimilarities and similarities in all languages.

d) Parallel Corpus

The parallel corpus means two or more corpora of diverse languages. In each corpus, it is composed of texts which are translated from one language into other language. It can be used by learners and translators to investigate the differences between languages and to find the potential similarities of expressions in each language.

e) Learner Corpus

The learner corpus is a text collection produced by learners, and it is used to collect all examples of words or phrase for learners who come across in different contexts.

f) Pedagogic Corpus

The pedagogic corpus includes all languages, or a set of language used in educational settings. It is used to collect all examples of words or phrase for learners from different contexts.

g) Historical or Diachronic Corpus

The historical or diachronic corpus is a corpus of texts taken from different periods of time. This corpus helps to trace the improvement of language within several aspects.

h) Monitor Corpus

The monitor corpus is made to get the current changes of language. To increase a size of corpus, the monitor corpus can be added to annually, monthly, and daily.

In short, corpus can be designed into eight types: specialized corpus, generalized corpus, comparable corpus, parallel corpus, learner corpus, pedagogic corpus, historical or diachronic corpus, and monitor corpus.

2.4.3 Corpus Design

Designing of corpus is important because the study can be well designed based on the inclusive information. The principles which should be considered for corpus design consist of homogeneity of disciplines, size of corpus, variety of source, availability, and variety of authors (Kaewphanngam, Broughtom & Soranasataporn, 2002; Hunston, 2002; McEnery & Wilson, 2001).

a) Homogeneity of Disciplines

A corpus of texts should be from the unique disciplines; therefore, the organization and linguistic features are noticeable (Kaewphanngam, Broughtom & Soranasataporn, 2002).

b) Size of Corpus

A corpus size of general academic text should be as big as possible to provide the credible results. For classroom objective, a good corpus usually contains at least 100,000 running words. However, it cannot justify for establishing a limit of corpus because the corpus size depends on the objectives of research (Hubston, 2002).

c) Variety of Sources

In the field of linguistics, a variety of language is more remarkable than an individual author or text (McEnery & Wilson, 2001). In corpus analysis, a better chance of finding language from diverse sources can occur because of diverse registers of language (Sinclair, 1991).

d) Availability

To make corpus, texts should be available for all researchers or students to access because the selected texts should be representative of language found easily.

e) Variety of Authors

Generally, a good corpus of academic texts should include texts from a variety of authors, topics, registers, and sources in order to construct the influenced corpus (Sinclair, 1991).

In brief, it is important to design the corpus in order to make corpus effectively and also discover the specific findings in any aspects of language. Homogeneity of disciplines, size of corpus, variety of source, availability, and variety of authors are considered to design the corpus.

2.4.4 Application of Corpus

A corpus-based study has become the main focus of research in the linguistic field. This study is interesting because corpora can be compared in terms of their frequency lists. Consequently, the frequency lists from corpora are useful to identify the differences between two corpora or more. The application of corpora is to study the different aspects of language which includes lexis, grammar, phraseology, discourse, pragmatics, register and genre.

a) Lexis

The lexis is basic information in a corpus and comprises of the word frequency list and word formation. According to Moon (2010), all corpora related to words are drawn from texts so how frequent the words are can be calculated and compared. The formation of words can be provided in the corpus including derivation and word compounds. Thus, the corpus can present data relevant to a list of word frequency and a formation of words.

b) Grammar

The grammar is concerned with "how sentences and utterances are formed", morphology and syntax (Carter & McCarthy, 2006). The studies of corpus involving English grammar have been useful to describe a variety of ways in language use. According to Conrad (as cited in O'Keeffe & McCarthy, 2010), the corpus-based studies in grammar can help to comprehend what writers and speakers actually do with an available linguistic resources in English.

c) Phraseology

The phraseology is one aspect of linguistic corpus, which can be used to create the meaning. The corpus linguistics can show how words used in texts, especially the significance of surrounding language (co-text), and the patterns of language (Cheng, 2012). The phraseology ranges from phrasal verbs, idioms, flexible phrases, fixed phrases, fixed sentences, jargon expression, to collocations (Cheng, 2012). According to Moon (2010), the corpus has occurred words as parts of phraseologies, collocation, or both.

d) Discourse

Discourse refers to a linguistic unit (as a conversation or a story) larger than a sentence (Schiffrin, Tannen & Hamilton, 2001). It can occur in any contexts

and forms. A corpus-based approach can provide the quantitative evidence of the existence of discourses for the researchers who can identify the linguistic patterns of language uses, reveal the hidden meanings in the lexical items, and examine the collocations (Baker, 2006).

e) Pragmatics

The pragmatics is defined as 'meaning in context' (McEnery & Wilson, 2001, p. 98), and is the language in use without a definite meaning. According to Rühlemann (2010), there are some problems in the relationship between pragmatics and corpus because the corpora of recorded texts have no context to understand the exact meanings. To search any patterns of pragmatics, the corpus have to be described pragmatically for corpus linguistic methods. (Cheng, 2012).

f) Register and Genre

The register and genre are applied from the corpus-based study. A corpus can be organized in terms of text categories (Biber, 2010). The corpus studies usually focus on the description of written registers: reports, email messages, business letters, advertisements, and academic prose; in addition, the corpus studies on register variation focus on the feature of linguistics (Cheng, 2012).

To sum up, a corpus can be helpful to explore the different aspects of linguistics such as lexis, grammar, phraseology, discourse, pragmatics, register and genres.

2.5 Genre Analysis

The word "*Genre*" refers to a perspective about text varieties which have been studied popularly in the field of linguistics. The details of genre analysis, which consist of the definition of genre, type of genre, objective of genre analysis and application of genre are presented in this section (Bhatia, 2002).

2.5.1 Definition of Genre

Genre is a category of texts related to a specific communicative function. Definitions of genre are described in different aspects.

Swales (1990) defined the genre as a distinctive type or category of literary composition, whether spoken or written. The concept of genre was defined by Swales

(1990) which is "*A genre comprise a class of communicative events, the members of which share some set of communicative purpose. These purposes are recognized by the expert members of the parent discourse community, and thereby constitute the rationale for the genre. This rationale shapes the schematic structure of the discourse and influences and constrains choice of content and style*" (p. 59).

Holmes (1997) defined the genre as a text category concerning a specific communicative function that lead to produce dominant structural patterns. Likewise, Hasan (1989) stated that a genre is briefly regarded as a dominant discourse in spoken or written texts for serving a particular purpose, including a series of moves.

Bhatia (2002) stated that genre analysis can be used to understand how language used in and shaped by socio-critical environment and to offer effective solutions to pedagogical and other applied linguistic problems.

In short, the genre is a type of text including spoken and written texts relevant to a specific communicative function. The main objective of genre analysis is to understand and to account for the realities of texts.

2.5.2 Type of Genre

Based on Swales and Feak (2000), the genre can be classified into two types: public genre and occluded genre.

a) Public / Open Genres are accessible to everyone, often published, and are easily visible and audible. For example, conference abstracts, book chapters, theses and dissertations, technical reports, conference prefaces, research articles, conference papers, and other talks are examples of the open genre.

b) Occluded / Supporting Genres are 'closed', not public in nature, and often difficult to access. For example, job applications, bio-statement, submission letters, job interviews, and curriculum vitae are examples of the supporting genre.

The genre can be divided into genre sets (Swales & Feak, 2000). For instance, abstract, introduction, methods, results, and discussion are the genre set of a research paper. The genre can be separated into genres and subgenres. For example, the genre of review consists of subgenres: book review, film review, and CD review.

In brief, a category of texts can be divided into two main types: open genre and occluded genre. Each text can also be separated into a genre set based on the type of texts.

2.5.3 Application of Genre

Based on Bhatia (2002), the application of genre is to study different perspectives of the universe of discourse which encompassed the real world perspective, the writer's socio-cognitive perspective, the discourse analysis' perspective, and the pedagogical perspective. The perspectives of discourse are summarized as Figure 2.2

The Real World Perspective

♦**Register Variation:** To identify different uses of language in terms of contextual factors of field, mode, and tenor of discourse such as scientific register, legal register, and medicine register.

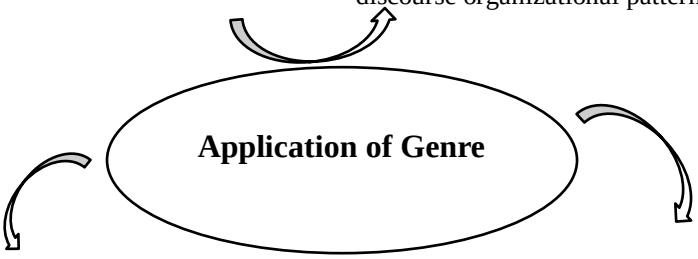
♦**Disciplinary Variation:** To define the differences of structure, vocabularies, modes of expression, and discourse among disciplines such as Formal Linguistics v. Applied Linguists, Economics v. Marketing, and Law v. Business.

♦**Generic Systems within Professional Communities:** To characterize a set of genre from members of a particular discourse community such as System of genres in Law: cases, judgments, ordinances, contracts, agreements.

♦**Colonies of Genre:** To find a collection of closely related and overlapping genres such as reporting genre, academic genre, and letter genre.

♦**Mixed and Embedded Genres:** To identify textual artifacts in terms of pure genres in order to communicate 'private intentions' within the context of 'socially recognized communicative. For example, corporate brochures are designed to be informative, which become increasingly promotional in character and tone.

♦**Cross-Cultural Variation:** find intercultural variations in generic realizations, especially in the use lexicon-grammatical and discourse organizational patterns



The Writer's Socio-Cognitive Perspective

Genre can be used to appropriate rhetorical resources and other generic conventions across genres, and do find a number of appropriated and mixed forms.

♦**Cross-Culture Variation:** *Proposals*: thesis proposals, project proposals.

♦**Mixed Forms:** *Introductions:* book introductions, prefaces, forewords, blurbs, and occasionally research article introductions

The Discourse Analysis's Perspective

♦**Corpus Studies:** To reveal patterns of form in particular genres and areas of languages.

♦**Textual Analysis:** To describe texts in linguistics, especially the analysis of lexicon-grammatical systems in register analysis, text-linguistics and discourse analysis based on systemic functional framework.

♦ **Critical and ethnographic analysis:** To investigate the developmental aspects of learner language, learning style preferences and writing practices of expert writers by collecting data in academic and educational contexts.

♦**Genre Studies:** to analyze a range of textual genres constructed, interpreted and used by members of various disciplinary communities in academic, professional, workplace and other contexts.

The Pedagogical Perspective

The pedagogical practices and procedures, often used to sensitize and prepare students to meet the communicative demands of disciplinary communication, provide necessary understanding of the concerns that determine the nature of discourse and genre analyses. For example, analyses of tasks and materials in the context make analytical findings related to the specific contexts of application, and help integrate analytical findings with language learning procedures.

Figure 2.2 Application of Genre

Obviously, the studies of genre analysis can be used to identify the difference of texts in each context in terms of linguistic aspects. The application of genre have been divided based on the different perspectives of the discourse universe, which involved the real world perspective, the writer's socio-cognitive perspective, the discourse analysis's perspective, and the pedagogical perspective.

To sum up, according to a variety of language features, the genre analysis is an important study for the fields of linguistics because it can help to typically identify texts by analyzing in various contexts and to demonstrate the pedagogy of academic communicative competence.

2.6 Move Analysis

The word of '*Move*' refers to a section of a text that performs a specific communicative function (Biber, Connor, & Upton, 2007). The study of move analysis was developed by Swales (1981) who studied on move in the introduction part of research articles. Swales' study has become a popular method of analyzing on genre in linguistic field. This section is designed to present the definition of move, importance of move, initiative of move studies, methods for move analysis, advantages of corpus-based perspective for move analysis, and the studies of move analysis in abstracts. The details of move analysis are described as follows.

2.6.1 Definition of Move

Swales (1990) defined the move as '*a segment of texts that performs a specific communicative purpose'* (p. 148). In the case of genre analysis, Swales (1981) originally developed rhetorical moves to describe the rhetorical organizational patterns of research articles and the communicative purposes of a text by categorizing the various discourse units in the text. Each move has its own aims, which can contribute to overall communicative purposes of genre (Biber, Connor, & Upton, 2007). In short, move analysis is the study of each section of texts which perform a specific communicative function.

2.6.2 Importance of Move

Move analysis can provide the patterns of text organization which were typically described with moves, and fulfill the communicative purpose of each genre; moreover, moves are defined as the functional units of text consisting of a series of moves (Biber, Connor, & Upton, 2007). A move can demonstrate the main component of each text through the frequency of move occurrences in the corpus. Moves can be categorized into two types: conventional moves which occur frequently in the genre more than other moves, and optional moves which occur at least in the genre (Biber, Connor, & Upton, 2007). The cut-off frequency used to separate between conventional move and optional move is 60% based on the practice of Kanoksilapatham (2007). It means that if some moves occur more than 60% of the entire corpus, they are considered to be the conventional moves, while if they occur less than 60% of the frequency in the entire corpus, they are considered to be the optional moves. The moves can represent the functional units of texts having a specific communicative purpose. They usually have distinct linguistic boundaries that can be objectively analyzed (Biber, Connor, & Upton, 2007). Essentially, move analysis is used to isolate text and examine it in order to determine the structure of genres, move order, move construction, and linguistic features.

2.6.3 Initiative of Move Studies

John Swales is the pioneer of move analysis. The studies of move have developed in the linguistic field due to Swales' studies. The main objective of move analysis is to define and explain the role of each move as a component of rhetorical structure of a particular part in a genre (Swales, 1990). Swales (1981) studied the section of introduction in research articles. He analyzed 48 research articles written in English from three different disciplines: 16 from physics, electronics, and chemical engineering, 16 from biology and medicine field, and 16 from social sciences. The results found that the introduction of research articles included four moves: Move1 Establishing the field, Move2 Summarizing previous research, Move3 Preparing for present research, and Move4 Introducing present research (Swales, 1981). Later, researchers discussed Swales' rhetorical structure which related to the first and the second move which were difficult to distinguish from one another. Then Swales

(1990) decided to combine them together and proposed a CARs model *(Creating a Research Space Model)*. Moreover, the model of CARs has been as one of the most influential tools in order to analyze on text structure (Swales, 1990). However, this model was criticized by Bunton (2002) that the moves did not occur only once in a sequence, but occurred in a cycle. Therefore, Swales (2004) revised the CARS model and pointed out two aspects of moves: the cyclical nature of moves and the importance of the frequency of moves. The Swales' model of move pattern of the introduction part in research articles is shown in Table 2.4.

Table 2.4 Swales' Model for Introductions of Research Articles

Published Year	Move 1	Move 2	Move 3	Move 4
1981	**Establishing The Field** A: Showing Centrality of Topic or B: Stating Current Knowledge of the Topic or C:Ascribing Key Characteristics	**Summarizing previous Research**	**Preparing for Present Research by** A: Indicating a Gap or B: Question Raising or C: Extending a Finding	**Introducing Present research by** A: Giving the Purpose or B: Describing Present Research
1990	**Establishing a territory** *Step 1* Claiming centrality and / or *Step 2* Making topic generalization(s) and / or *Step 3* Reviewing item of previous research	**Establishing a niche** *Step 1A* Counter-claiming or *Step 1B* indicating a gap or *Step 1C* Question-raising or *Step 1D* Continuing a tradition	**Occupying the niche** *Step 1A* Outlining purpose or *Step 1B* Announcing present research *Step 2* Announcing principal findings *Step 3* Indicating RA structure	
2004	**Establishing a territory (citations required)***** via *Step 1* Topic generalizations of increasing specificity	**Establishing a niche (citations possible)***** via *Step 1A* Indicating a gap or *Step 1B* Adding to what is known *Step 2* Presenting positive justification (optional)	**Presenting the present work** via *Step 1* Announcing present research descriptively and / or purposively (obligatory) *Step 2* Presenting research questions or hypothesis* (optional) *Step 3* Definitional clarifications (optional)* *Step 4* Summarizing methods (optional)* *Step 5* Announcing principal outcomes (PISF**) *Step 6* Stating the value of the present research (PISF**) *Step 7* Outlining the structure of the paper (PISF**)	

Note (2004) * Step 2-4 are not only optional but less fixed in their order of occurrence than the others
** PISF: Probable in some fields, but unlikely on others
*** to be prevalent, especially in longer introductions

In short, Swales' model study of move analysis relevant to genre can certainly share common types of move, and each move would have own unique structural characteristics that represent the specific communicative functions of a genre.

2.6.4 Methods for Move Analysis

According to Kanoksilapatham (2007), the methods for move analysis consist of general steps of move analysis and inter-rater reliability, which are elaborate and systematic processes. Two steps of methods are described as follows:

a) General Steps of a Move Analysis

The common procedure in a move analysis is an important process for researchers. Kanoksilapatham (2007) also summarized the simple process of move analysis based on a corpus-based approach as shown Table 2.5.

Table 2.5 General Steps for Conducting a Corpus-based Move analysis

Step	Explanation
1	*Determine rhetorical purposes of the genre.*
2	*Determine rhetorical function of each text segment in its local context; identify the possible move types of the genre.*
3	*Group functional and semantic themes that are either in relative proximity to each other or often occur in similar locations in representative texts. These reflect the specific steps that can be used to realize a broader move.*
4	*Conduct pilot-coding to test and fine-tune definitions of move purposes.*
5	*Develop coding protocol with clear definitions and examples of move types and steps.*
6	*Code full set of texts, with inter-rater reliability check to confirm that there is clear understanding of move definitions and moves/steps are realized in texts.*
7	*Add any additional steps and moves that are revealed in the full analysis.*
8	*Revise coding protocol to resolve any discrepancies revealed by inter-rater reliability check or by newly 'discovered' move/steps, and re-code problematic areas.*
9	*Conduct linguistic analysis of move features and other corpus-facilitated analyses.*
10	*Describe corpus of texts in term of typical and alternative move structures and linguistic characteristics.*

(Kanoksilapatham, 2007, p. 34 cited in Biber, Connor, & Upton, 2007)

This process is the simple way to do a corpus-based move analysis which represents the rhetorical movement of functional purposes of the text parts that make up the genre.

b) Inter-rater Reliability

According to to Kanoksilapatham (2007), there are two methods for reporting inter-rater reliability, which are percentage of agreement and Cohen's kappa statistics. The percentage of agreement is the simplest method that reflects the amount of agreements per total amount of coding decisions among raters, but it cannot account a chance of agreements among raters. Therefore, Cohen's kappa is one statistic which can give a chance-corrected measure of inter-rater reliability that assumes two raters, *n* case, and *m* mutually exclusive and exhaustive nominal categories (Biber, Connor, & Upton, 2007). In addition, Fleiss's kappa would measure the agreement of three raters and one researcher to classify the same sets of items. Fleiss's kappa was used when the research comprised three or more raters, and also used for nominal scale (Mchugh, 2012). The process of identifying and discussing discrepancies increases inter-rater reliability among researchers and results in more valid and consistency interpreted move framework for a genre.

To sum up, in order to study move analysis, there are two main processes to do the corpus-based move analysis, which are the general steps of moves *(Identifying moves and steps)* and the step of inter-rater reliability *(Measuring the agreement among raters)*.

2.6.5 Advantages of Corpus-Based Perspective for Move Analysis

The study of move analysis is useful for the researchers in linguistic field. According to Biber, Connor, and Upton (2007), there are four specific advantages of a corpus-based move analysis. Firstly, move analysis can be used to identify the linguistic features of move. The features frequently found to be associated with move functions concerned verb tenses: present, past, and future, as well as the use of passive voice verb forms. The second advantage would arise from move frequencies and lengths, where the study of move analysis could describe the distributional and structural characteristics of move types which allow the researchers to make a clear determination of the particular move type: obligatory, expected, or merely optional.

The third advantage related to mapping move use and locations. For instance, it is possible to look at the relationships that different move types have with each other. The fourth advantage concerns genre prototypes and the ability to develop genre prototypes. The prototypes are specific valuable in the contexts of education and training in order to help the novice learners to understand on genre. Move analysis has become popular in linguistic field because it can explore the rhetorical structure of a genre as well as its linguistic features (Biber, Connor, and Upton, 2007).

2.6.6 Studies on Move Analysis in Abstracts

The studies on abstracts have focused on both the rhetorical moves and linguistic features found in any genre. Abstracts are crucial parts of articles and contribute to the knowledge of the structural organization of abstracts in English, which is beneficial. In the case of abstract studies, studies have focused on to identify the overall organization of abstracts in specific disciplines (Bhatia, 1993; Taddio et al., 1994; Santos, 1996; Samraj 2005; Pho 2008; Cross & Oppenheim 2006; Oneplee & Soranastaporn, 2008, Prabripoo, 2009; Kafes, 2012; Kanoksilapatham, 2013). The studies of move analysis in abstracts of research articles are divided into sections, model studies and previous studies, which are described as follows.

a) Model Studies

Based on previous studies, three model studies were adopted to analyze the abstracts, under Bhatia (1993), Taddio et al. (1994), and Santos (1996).

1) Bhatia (1993) found four basic moves: purpose, methodology, results, and conclusion.

Move 1: introducing purpose,
Move 2: describing methodology,
Move 3: summarizing results,
Move 4: presenting conclusions.

Move 1 *(introducing purpose)* indicates the authors' intention and understanding hypothesis that form the basis of the study. Generally, a clear mention of objective in the research or statement of problem that the authors wish to resolve might be included. Move 2 *(describing methodology)* gives a precise description of the research design including the information on how data was collected and method used.

Move 3 *(summarizing results)* reports the findings, including suggestions, on solving the problem. Lastly, Move 4 *(presenting conclusions)* interprets the results, makes inferences and indicates implications and applications of the research. Distinctly, different moves serve different purposes.

2) Taddio et al. (1994) studied the abstracts in the medical field, and proposed the pattern of move which comprised eight moves and thirty-three criteria and put forth a more detailed move pattern, as shown in Table 2.6.

Table 2.6 Taddio et al.'s Move Pattern of Research Article Abstracts (8 moves)

Moves
Move 1 is about purpose, and asks: 1 was any information on the purpose given? 2 was the purpose explicitly stated? 3 was the main purpose distinguished from secondary ones?
Move 2 is limited to research design, examined with these questions: 1 was any information on the research design given 2 were technical descriptors used? 3 if a follow-up study, was the duration given?
Move 3 is setting, and described with these questions: 1 was any information on the setting given? 2 was the level of clinical care (e.g. primary care) indicated?
Move 4 is subjects, the following questions are asked: 1 was any information on the subjects given? 2 were common demographic characteristics given? 3 were technical descriptors of subject selection (e.g., random sample) used? 4 was the number of subjects indicated? 5 were the response and refusal rates indicated? 6 was the number of dropouts and losses indicated? 7 if the samples were matched were matching characteristics given?
Move 5 is intervention, examined with these question: 1 was any information on intervention given? 2 were the commonest name and common synonyms given? 3 was a description given? 4 was the duration indicated?
Move 6 is measurement, four questions are asked: 1 was any information on the measures given? 2 were the variables explicitly defined? 3 was the source of the data given? 4 if the measurements were subjective were the observers blinded to the patient groupings?

Table 2.6 Taddio et al.'s Move Pattern of Research Article Abstracts (cont.)

Moves
Move 7 is result, which inquired to check: 1 were any results given? 2 were they directly related to the purpose? 3 were appropriate numeric data given? 4 were appropriate statistical values given?
Move 8 is conclusion, six questions are asked: 1 were any conclusions drawn? 2 were they directly related to the purpose? 3 were they consistent with the results? 4 were the study's limitations mentioned? 5 were the study's implications mentioned? 6 were there recommendations for further study?

(Taddio et al., 1994, p. 1614)

According to move patterns, there were eight moves: purpose, research design, setting, subjects, intervention, measurement, results, and conclusion, and 33 sub-moves presented as questions. In the case of Taddio et al. (1994), the abstracts could be separated into the scientific field which differed from Santos (1996).

3) Santos (1996) is a linguist who studied move analysis in order to emphasize the organization of text analysis. Santos developed a move analysis which reflected the characteristics of the genre itself, especially discourse organization of research article abstracts in the field of linguistics. Santos (1996) studied the organization of 94 abstracts in three journals in the field of Applied Linguistics based on the works of Swales (1990), Dudley-Evans (1986), and Crookes (1986). He found that abstracts included five moves: Move1 situating the research, Move2 Presenting the research, Move3 Describing the methodology, Move4 Summarizing the results, and Move5 Discussing the research. The model of moves is illustrated, and his findings are shown in Table 2.7.

Table 2.7 Santos' move pattern of Abstract in Research Articles (1996)

The Five Moves	Frequency
Move 1: Situating the research	**40**
Sub-move 1A – Stating current knowledge	30
And / or	
Sub-move 1B – Citing previous research	7
And / or	
Sub-move 1C – Extended previous research	3
Sub-move 2 – Stating the problem	24
Move 2: Presenting the research	**93**
Sub-move 1A – indicating main features	77
And / or	
Sub-move 1B – indicating the main purposes	26
And / or	
Sub-move 2 – Hypothesis raising	18
Move 3: Describing the methodology	**92**
Move 4: Summarizing the results	**75**
Move 5: Discussing the research	**58**
Sub-move 1 – Drawing conclusions	50
And / or	
Sub-move 2 – Giving recommendations	12

Santos (1996) described more details of each move found within abstracts, and gave an in-depth picture of five move patterns.

Move 1: Situating the research

To attract the attention of the readers as the goal of writing an abstract, the authors need to characterize the opening move which is *situating the research*.

Move 1: *Sub-move 1A-stating current knowledge*

In this Sub-move 1A, the authors may (1) identify the field by stating that a given topic is of considerable professional concern, (2) state current ideas or picture in teaching and research, and (3) offer the readers generalizations regarding the state of the art. The example of (1), (2), and (3) are as follows:

(1) *Cloze tests have been the focus of considerable interest in recent year as easily constructed and scored measures of integrative proficiency.*

(2) *Current research has supported the existence of a critical period for the acquisition of the grammar of a second language.*

(3) *The meanings and forms of tenses are complex and often difficult for non-native speakers to acquire.*

(Santos, 1996, p. 486)

Move 1: *Sub-move 1B-cating previous research*

Sub-move 1A is accompanied by the naming of specific researchers. To avoid the problem in the text elements lose their *stating current knowledge status* and are assigned the status of *citing previous research*, Sub-move 1B may be best suited as authors attempt to give further credibility to the claim outlined in Sub-move 1A by relating *what has* been claimed to the person *who has* claimed it. The example is as below.

Empty pronouns are not only acceptable in finite clauses of Spanish and Chinese but are pragmatically more natural.

Move 1: *Sub-move 1C-extending previous research*

In Sub-move 1C, it seems to be that authors provided a weak challenge to previous research while presenting their research as being in accord with current research trends. Thus, the example below might be interpreted as authors' efforts to clarify that the current research is part of an ongoing debate.

Extending the research done on the effects of different types of task and different participant arrangements used to foster negotiated interaction among L2 learners, we attempt to ...

(Santos, 1996, p. 487)

Move 1: *Sub-move 2-stating the problem*

The problem statements offer some evaluation of the current state of knowledge as outlined in Sub-move 1, and point out that previous research has not been thoroughly successful or complete. The examples are as follows:

(1) *... few studies have been done on ...*

(2) Empirical studies designed to … have *provoked wildly conflicting* results.

(3) *This empirical investigation sought to* determine the attitudes of both L1 compare and/or contrast those attitudes.

(Santos, 1996, pp. 487-488)

Move 2: Presenting the research

The role of Move 2 is to make a kind of announcement that justifies the articles to describe the key features of the research, by presenting its purpose. The Move 2 can also take one of two forms: a *descriptive* form or a *purposive* form. The examples are given in Sub-move 1A and Sub-move 1B as below.

Move 2: *Sub-move 1A-indicating main features*

There is a clearly predominating formula like pattern employed by the authors in the corpus to signal their Move 2. On Sub-move 2, it seems to contain a restriction concerning the verb tense and the noun phrase. The examples are as follows:

(1) *This study investigates …*

(2) *In this study, we investigate …*

(Santos, 1996, p. 490)

Move 2: *Sub-move 1B-indicating the main purposes*

Sub-move 1B contained a mixture of forms that essentially carries the purposive nature via the verb phrase. The examples are as below.

(1) The empirical investigation *sought to …*

(2) The *purpose* of this study was to …

(Santos, 1996, p. 490)

Move 2: *Sub-move 2-hypothesis raising*

In hypothesis-raising statements, authors outline their research hypotheses or question. It would seem that this sub-move plays a supporting role in the presentation of research as it helps to describe the main features of the work in question in more detail. For example, the corpus contained *would, could, can, may, and will.*

Move 3: Describing the methodology

This move occurred by itself and merges with other moves. It indicated the design of the study in term of subjects, procedures, materials, instruments, variables according to the type of experimentation. It can thus assume that (1) some authors delay the occurrence of move 3, by placing it entirely in a post-move 2 sentence; (2) some others anticipate that information somehow by merging it with move 2, although in a quick, *in passim* fashion; and, (3) still others may see the opening statement as a

privileged window to project the bulk of information as early as possible. The examples are as follows:

(1) This study examines the responses of *60 Spanish, Chinese, and GermanL2 learners* to English sentences with empty pronominal categories (ECs).

(2) This paper is concerned with how *advanced L2 learners of English* interpret reflexive anaphors and pronominal.

(3) This study investigates the listening comprehension of *388 high-intermediate listening proficiency (HILP) and low-intermediate listening proficiency (LILP) Chinese students of English as a foreign language.*

(4) *Using three information transfer tasks and interviewing discussion session*, we attempted to investigate the actual communicative outcomes of interaction prompted by the tasks.

(5) *Over a two-week period …*

(6) *Using a qualitative discourse-analytic framework …*

(7) The *first* phase of the study …

(8) The *second* phase of the study …

(Santos, 1996, pp. 491-492)

As a discoursal move, Move 3 was used to retell the study of the research proper, and is almost exclusively in the past tense. Researchers might thus use tense-voice correlation to establish their readership at the point reached by them in their abstract.

Move 4: Summarizing the results

Move 4 is used to summarize briefly the main findings of the research, and indicates how the data were manipulated. The examples are as below.

(1) *Results showed that* moderately fast speech rates resulted in …

(2) *A factor analysis* of the ESL teacher's data *revealed* five factors …

(3) *A factor analysis* of the non-teacher's data *yielded* four factors …

(4) *A factor analysis* of the combined-group data *revealed* five factors

(5) *A MANOVA and a series of univariate analysis* of *… show …*

(6) *… revealed greater and more* consistent growth in *… than* for *…*

(Santos, 1996, pp. 493-494)

Move 5: Discussing the research

The researcher made to claim relative to the value or implication of the results obtained covering both the evaluation of the findings. The other type of sub-moves characterized the linking of the reported research back to the broad research fields typically realized by two sub-moves as below.

Move 5: *Sub-move 1-Drawing conclusion*

On this move, the conclusion statements meant to answer the questions are clearly signaled in a number of ways, using verbs like *suggest, or interpret,* as shown follows:

(1) The results *suggest* that misunderstanding of …

(2) *It is concluded* that large-scale testing of oral communication is …

(3) *These findings* lend string support to our hypothesis that …

(4) The *research* provides evidence of the importance of case studies in verifying critical assumptions about …

(5) The main *conclusions* of this study are …

(Santos, 1996, p. 495)

Move 5: *Sub-move 2-Giving recommendations*

In Sub-move 2, it may briefly outline suggestions for further study. The example is as below.

Implications and conclusions of the results to foreign language learning are drawn.

(Santos, 1996, p. 496)

To sum up, Bhatia (1993)'s model includes four moves: introducing purpose, describing the methodology, summarizing the results, and presenting conclusion. Taddio et al. (1994) proposed eight moves: purpose, research design, setting, subjects, intervention, measurement, results, and conclusion. The model of Santos (1996) consists of five moves: situating the research, presenting the research, describing the methodology, summarizing the results, and discussing the research. While Bhatia (1993) and Taddio et al. (1994) proposed coincidentally that the first move is purpose, Santos stated the first move is situating the research.

b) Previous Studies

The previous studies of move analysis in abstracts have shown different aspects: framework, discipline, and number of abstracts. The following section concerns the examples of previous studies conducted on move analysis of abstracts, which consists of seven studies of Samraj (2005), Cross and Oppenheim (2006), Pho (2008), Oneplee and Soranastaporn (2008), Prabripoo (2009), Kafes (2012), and Kanoksilapatham (2013).

1) Samraj (2005) analyzed abstracts across the two disciplines of conservative biology and wildlife behavior. She found that abstracts from both disciplines generally contain these moves: purpose, results, and conclusions, i.e. the same types of moves. However, on average, Conservation Biology abstracts contained more moves than Wildlife Behavior abstracts. Her findings found that the abstracts of Wildlife Behavior included the moves: situating the research (45%), purpose (65%), methods (50%), results (100%), and conclusion (80%), while the abstracts of Conversation Biology consisted of situating (90%), purpose (100%), methods (50%), results (100%), and conclusion (80%).

2) Cross and Oppenheim (2006) analyzed the move structure of 12 abstracts in protozoology. They found that data in the corpus followed the five move patterns which consisted of *'Relation to other research'*, *'Purpose'*, *'Methodology'*, *'Results'*, and *'Discussion'*. Furthermore, on *'Methodology'*, and *'Results'*, they found that moves were obligatory in all abstracts. They suggested that students must be taught some of the processes of constructing well-formed and effective abstracts in order to help them to successfully present, communicate and persuade others of the importance of their research.

3) Pho (2008) compared and contrasted English abstracts on applied linguistics and educational technology. 30 research article abstracts in the field of linguistics and educational technology were analyzed based on the framework of Santos (1996). The findings found that abstracts followed the five-move pattern. The abstracts of linguistic field included *'Situating the research'* (45%), *'Presenting the research'* (100%), *'Describing the methodology'* (100%), *'Summarizing the results'* (100%), and *'Discussion the research'* (80%), but the scientific abstracts contained '*Situating the research'* (30%), *'Presenting the research'* (100%), *'Describing the*

methodology' (90%), *'Summarizing the results'* (100%), and *'Discussion the research'* (50%). This finding can ensure the disciplinary differences between the linguistic field and the scientific field. In the case of frequency of moves, *'Presenting the research'*, *'Describing the methodology'*, and *'Summarizing the results'* were used frequently, and followed the framework of Santos (1996) as well.

4) Oneplee and Soranastaporn (2008) studied a genre analysis of scientific abstracts: a comparative study of science and nature journals. The purposes of this study were to investigate, compare, and analyze the organization of journal article abstracts in the scientific field. One hundred article abstracts from two journals, namely 'Science' and 'Nature' published in 2006-2008 were analyzed. The framework was based on Santos (1996). This study indicated the abstracts were written with five moves: Background information, Purpose, Method, Result, and Conclusion. Abstracts in the field of science were mainly focused on the moves: situating the research (85%), summarizing the results (67%), and drawing conclusions (71%) which as the conventional moves.

5) Prabripoo (2009) studied the organization of thirty Ph.D. thesis abstracts in Science written by students from Faculty of Science, Mahidol University during 2006-2007. The framework of data analysis was based on move pattern of Taddio et al. (1994). According to framework, there are eight moves: '*Purpose*' (>90%), '*Research design'* (>90%), '*Setting*' (20%), '*Subjects*' (>90%), '*Intervention*' (>20%), '*Measurement'* (>40%), '*Results*' (>90%), and '*Conclusion*' (90%), with other 33 sub-moves. The findings showed the abstracts followed the framework of Taddio 8 moves and to abstracts in the scientific field according to the framework of Taddio (1994).

6) Kafes (2012) investigated the extent of rhetorical variation in RA abstracts written by American and Taiwanese academic writers, and Turkish academic writers in the field of social sciences. The corpus comprised 138 article abstracts published in the journal, 'Social Behavior and Personality' based on the Swales approach. On the average, the findings found that the abstracts of three groups had the moves of introduction (26%), purpose (100%), method (96%), results (99%), and conclusion (53%). In addition, the findings found that abstracts conformed closely to the M2 (*Purpose*)-M3 (*Method*)-M4 (*Result*) arrangement.

7) Kanoksilapatham (2013) studied 60 English abstracts in civil engineering research articles systematically selected from the top journals in civil engineering with reference to Swales' genre analysis. She found five moves: background, purpose, methodology, result, and discussion, which followed Swales. The move of methodology had the most occurrences in abstracts with 93.33%, and other moves found in the corpus are the move of results (91.67%), purpose (68.33%), discussion (66.67%), and background (60.00%) respectively. As a result, the patterns of P-M-R, M-R-D, M-R, and P-M-R-D are also found in this dataset. The studies of abstracts in various fields based on move analysis are summarized as the Table 2.8.

Table 2.8 Studies of Abstract of Research Articles in Various Fields

Framework	Author (Year)	Number of Abstracts	Fields	Results
Bhatia (1993)	Samraj (2005)	12	Conservation Biology and Wildlife Behavior	Purpose Methods Results Conclusion
General agreement of abstract guideline	Cross and Oppenhiem (2006)	12	Protozoology (Science)	**Move 1:** situates the research within the scientific community **Move 2:** introduces the research by either describing the main features of the research or presenting its purpose **Move 3:** describes the methodology; **Move 4:** states the results **Move 5:** draws conclusions or suggests practical applications
Taddio et al. (1994)	Prabripoo (2009)	30	Science	Purpose Research design Setting Subjects Intervention Measurement Results Conclusion
Santos (1996)	Pho (2008)	30	Linguistics and Education Technology	**Linguistics** M1 *Situating the research'*, M2 *'Presenting the research'*, M3 *'Describing the methodology'*, M4 *'Summarizing the results'*, and M5 *'Discussion the research'*, **Education Technology** M2 *'Presenting the research'*, M3 *'Describing the methodology'*, M4 *'Summarizing the results'*,
	Oneplee and Soranastaporn (2008)	100	Science	Background information Purpose Method Results Conclusion
Swales approach (1990, 2004)	Kafes (2012)	138	Social Science	Introduction Purpose Methods Results Conclusion
	Kanoksilapatham (2013)	60	Civil Engineering	Background Purposes Methodology Results Discussion

From Table 2.8, each previous study used a different framework to analyze the data, and their findings showed different details. For example, Kafes (2012 and Kanoksilapathan (2013) used the same framework based on Swales (1990, 2004), but the compositions of moves are diverse. The works of Samraj (2005) and Cross and Oppenhiem (2006) were studied in the field of science, but the first move was different. It may be explained that each framework is applicable in some fields and may not be appropriate in others. Thus, this study aimed to study on move analysis in order to explore the structural organization of abstracts in the fields of laboratory and cell biology in order to explore the applicability of the framework of Taddio et al (1994) in both fields.

Chapter Summary

This chapter has presented the theoretical background related to this study, frameworks used in the studies of moves, literature concerning the topic, as well as previous studies on moves. Move analysis is one theory used to reveal certain aspects of writing in each text. The abstract is one type of texts used to analyze in many studies based on the framework of move analysis. It is a summary set of data complexity in the paper, which the researchers used to analyze in terms of the rhetorical structure. As shown in the previous studies, the findings show that abstracts in each discipline have the differences of moves in terms of amount of moves, sequences, and components. Therefore, it is interesting to see how the abstracts between two disciplines were organized.

CHAPTER III
RESEARCH METHODOLOGY

The purpose of this study was to investigate the organization of article abstracts in the fields of laboratory animal and cell biology. This section of research methodology shows how the study was conducted to achieve the objectives. This section is composed of nine sections: research design, selection of journal, source of corpus, designing corpus, corpus development, framework of corpus analysis, data analysis, research instrument, and statistics.

3.1 Research Design

The research procedures inform the study. The framework of the study is a crucial part of designing the study. In order to achieve the objectives of this study, the overall procedures are shown.

Firstly, the language inputs for the corpus of this study were prepared. The researchers interviewed the director of the National Laboratory Animal Centre, Mahidol University on March 20, 2015 in order to analyze the needs, wants, and difficulties before selecting journals.

Secondly, the laboratory animal and cell biology journals were selected based on the impact factor in Journal Citation Reports and the value of quartile by SCImago Journal & Country Rank. The researchers selected the journals and decided to select the abstracts of laboratory animal review articles and cell biology research articles published in the period of 2012-2014. This is because no research of moves was conducted to compare the abstracts between review articles and research articles, and in the fields of laboratory animal and cell biology.

Next, the samples of laboratory animal abstracts and cell biology abstracts were downloaded and saved from the official websites: http://ilarjournal. oxfordjournals.org/ and http://jcb.rupress.org/. Fifty abstracts of laboratory animal

review articles and 50 abstracts of cell biology research articles during the period of 2012-2014 were selected. Each abstract stored in PDF files was individually converted into and saved in word files (*.docx), and was checked for spelling errors before processing the corpus.

The frequency of moves in abstracts was explored by using Excel program. The researcher and three inter-raters analyzed each sentence from all abstracts based on the framework of Taddio et al. (1994), and the occurrences of moves were counted by using frequency and percentage.

Next, the sequences of moves in each abstract were explored in order to study the organization of the abstracts. The sequences of moves were presented into patterns between the abstracts of laboratory animal review articles and the abstracts of cell biology research articles, and described in terms of frequency and percentage.

The language uses of highest-frequency move in the abstracts of laboratory animal review articles and cell biology research articles were explored in terms of verb choices, tenses, voices, and types of sentence.

Finally, the research compared the frequency and the sequence of moves between the abstracts of laboratory animal review articles and the abstracts of cell biology research articles in order to measure the differences of both journal abstracts.

In summary, there are six steps in the conceptual framework of this study. The framework started from preparing language inputs for corpus, to selecting journals, to preparing abstract files, to exploring the frequency of moves, to exploring the sequence of moves, and to comparing between both types of abstracts. All steps were conducted in six main steps as shown in the following Figure 3.1.

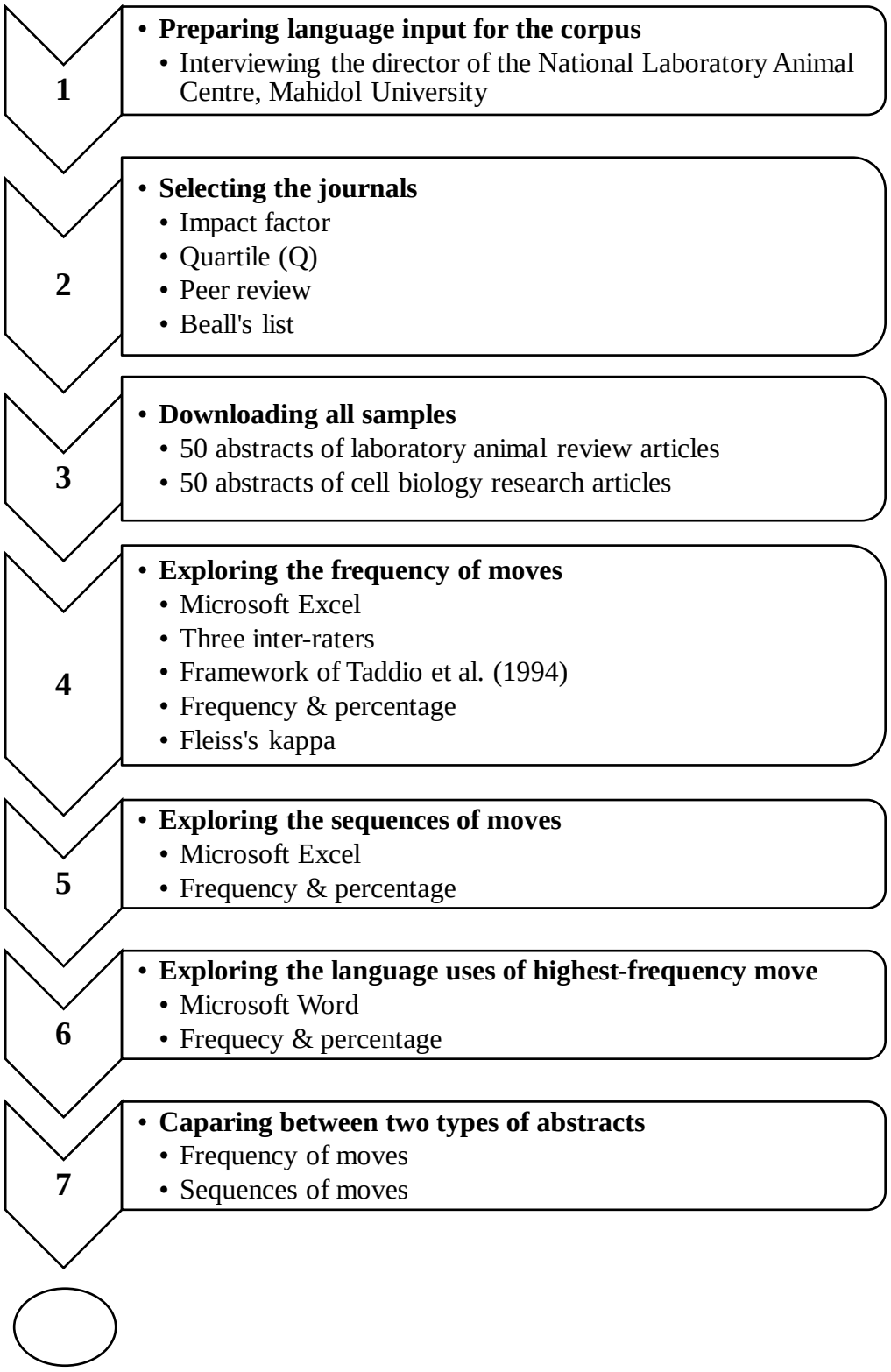


Figure 3.1 Research Design

3.2 Selection of the Journal

The criteria of validation are important to ensure the reliability of data. The selection of the journals in this study is based on four criteria: Beall's list, peer-review, impact factor, and quartile in category, as described as follows.

3.2.1 Beall's List

Beall's list is the list of publishers and standalone journals which is indicative of low-quality in terms of article assessment. This first criterion is to exclude all journals listed in Beall's list to ensure the reliability of journals. The journals were checked against the Beall's list entries, and were therefore found not to be predator journals.

3.2.2 Peer-Review

Peer-review is the evaluation of research articles by one or more scholars of similar competence to the authors of the research articles. Both laboratory animal and cell biology journals are the international peer-reviewed journals as identified on their webpages (Ilarjournal.oxfordjournals.org, 2015; Rupress.org. 2015). The articles from two journals were evaluated from peers before publication.

3.2.3 Impact Factor

Journals selected in this study must have impact factor at least 2.000. This is because the researcher needed to evaluate journals' relative importance. Impact Factor is the average number of times articles from the journal published in the past two years have been cited in the Journal Citation Reports (JCR) year (Reuters, 2015). See more details Table 3.1.

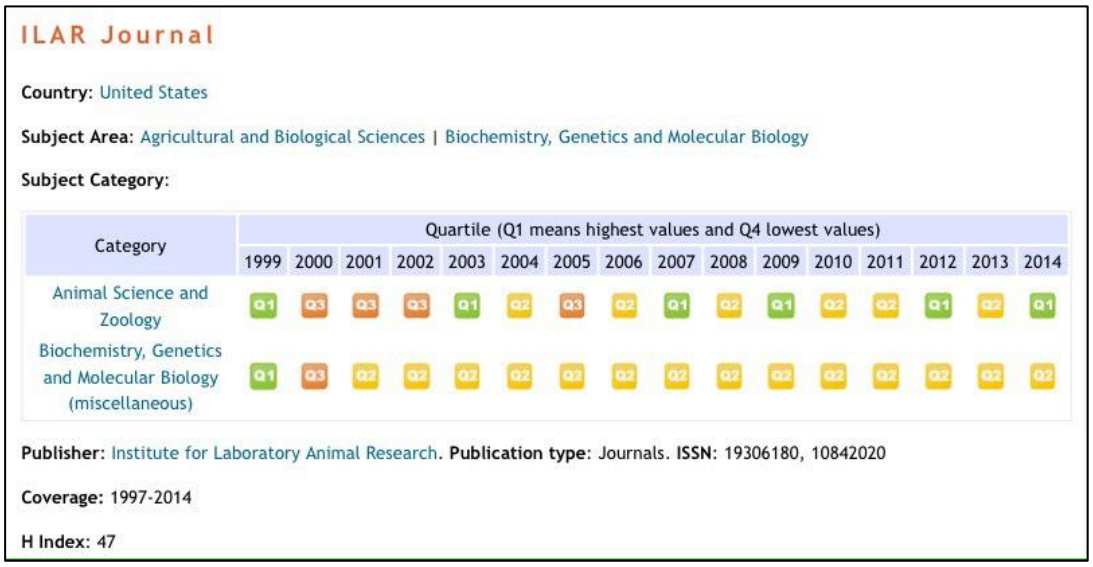
Table 3.1 Details of both Journals from Journal Citation Reports (2015)

Abbreviated Journal Title	Journal Citation Report Data					
	Total Cites	Impact Factor	5-Year Impact Factor	Immediacy Index	Articles	Cited Half-life
ILAR*	1180	2.393	2.158	0.391	46	8.2
JCB**	71695	9.834	10.765	1.904	249	>10.0

Journals from: * publishers OXFORD UNIV PRESS **publishers ROCKEFELLER UNIV PRESS

3.2.4 Quartile in Category (Q)

Journals selected in this study must have quartile at least Q2. The quartile is a value indicator related to the journal ranking. There are four data values of the quartile (Q) consisting of Q1 (highest), Q2 (high), Q3 (low), and Q4 (lowest). According to Journal Citation Reports (2014), *ILAR* and *JCB* are in Q1 (Reuters, 2014). Based on the criteria in the SCImango Journal Rank (SJR), the quartile of *ILAR* journal in the period of 2010 and 2014 is Q1 to Q2; that is, the ILAR journal is of top two highest value ranks. For *JCB* in the SCImago Journal Rank (SJR), the value is highest (Q1). See more details in Figure 3.2, 3.3.



ILAR Journal

Country: United States

Subject Area: Agricultural and Biological Sciences | Biochemistry, Genetics and Molecular Biology

Subject Category:

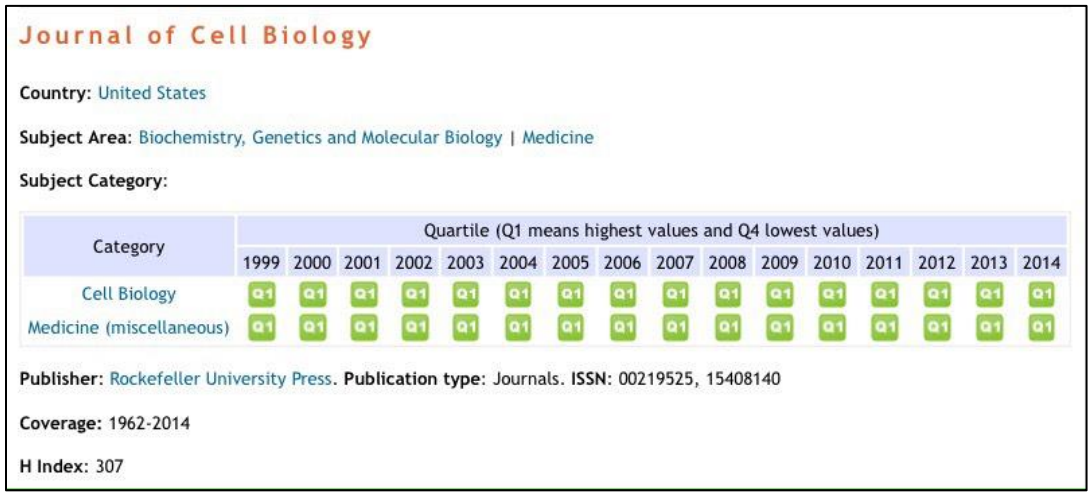
Category	Quartile (Q1 means highest values and Q4 lowest values)															
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Animal Science and Zoology	Q1	Q3	Q3	Q3	Q1	Q2	Q3	Q2	Q1	Q2	Q1	Q2	Q2	Q1	Q2	Q1
Biochemistry, Genetics and Molecular Biology (miscellaneous)	Q1	Q3	Q2	Q2	Q2	Q2	Q2	Q2	Q2	Q2	Q2	Q2	Q2	Q2	Q2	Q2

Publisher: Institute for Laboratory Animal Research. **Publication type:** Journals. **ISSN:** 19306180, 10842020

Coverage: 1997-2014

H Index: 47

Figure 3.2 Quartile of the *ILAR* journal from 1999 to 2014



Journal of Cell Biology

Country: United States

Subject Area: Biochemistry, Genetics and Molecular Biology | Medicine

Subject Category:

Category	Quartile (Q1 means highest values and Q4 lowest values)															
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Cell Biology	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1
Medicine (miscellaneous)	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1

Publisher: Rockefeller University Press. **Publication type:** Journals. **ISSN:** 00219525, 15408140

Coverage: 1962-2014

H Index: 307

Figure 3.3 Quartile of the *JCB* Journal from 1999 to 2014

Based on four criteria via Journal Citation Reports (JCR) and SCImago Journal and Country Rank Scholarly, the journals of *ILAR* and *JCB* are considered to be this corpus for this study. Therefore, the articles and their English abstracts from *ILAR* and *JCB* journals are appropriate for this study. The journal selection had the process as Figure 3.4.

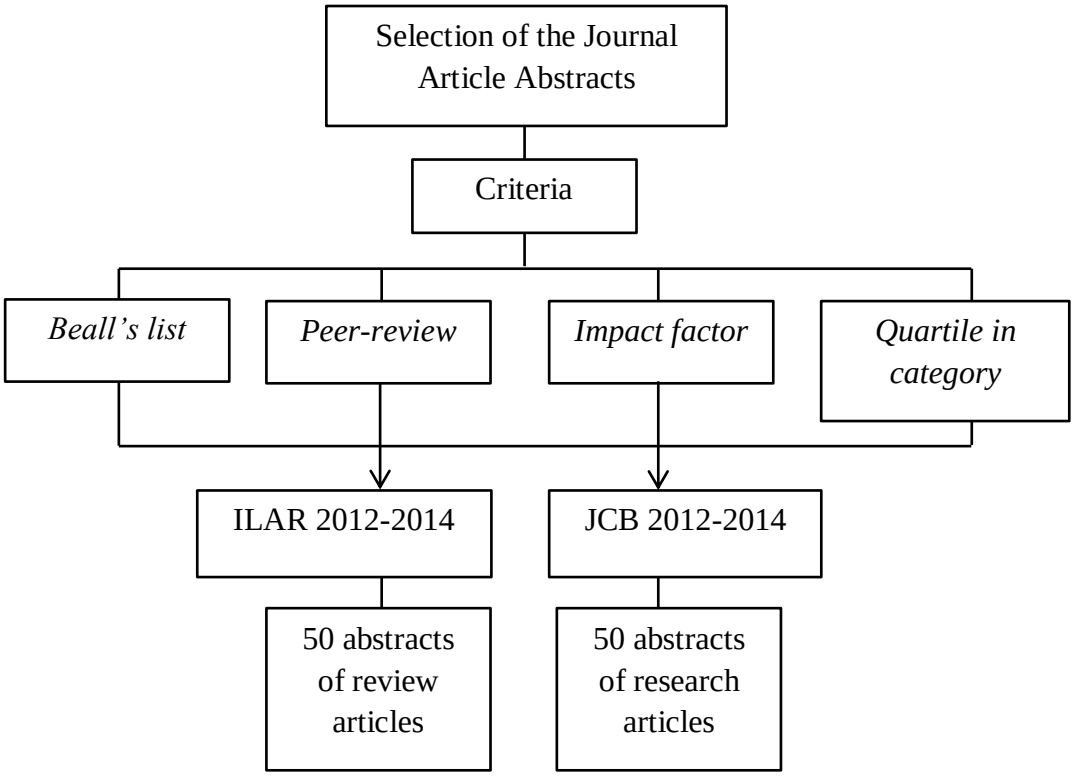


Figure 3.4 Selection of the Journal Article Abstracts

3.3 Source of Corpus

The article abstracts in the field of science are used as the academic text in order to create the corpus of the study. This study consists of two main corpora from two journals: *ILAR* corpus and *JCB* corpus. The description of corpora is shown as follows.

3.3.1 ILAR Corpus

The first corpus was the set of laboratory animal review article abstracts in the area of biology. There were 50 abstracts from three years in the period of 2012-2014 from Institute for Laboratory Animal Research Journal *(ILAR).* The *ILAR* journal is the peer-reviewed, theme-oriented publication of the Institute for Laboratory Animal Research published by Oxford University Press, which aims to provide timely information for all who use, care for, and oversee the use of animals in research. The ILAR journal was published thrice a year, and had about 12 articles in each issue. This journal also published review research of original articles to promote the high quality, human care and animal, and the appropriate consideration of use alternatives.

3.3.2 JCB Corpus

The second corpus was the set of cell biology research articles abstracts in the area of biology. There were 50 abstracts from three years in the period of 2012-2014 from the Journal of Cell Biology *(JCB)*. The JCB is an international peer-reviewed journal published by the Rockefeller University Press. The JCB was published four times a year, and had about 40 articles in each volume. In this journal, the scientists began to explore intracellular anatomy using the emerging technology of electron microscopy. The scope of the journal concerns Biophysical and Biochemical Cytology, which designed to provide a common medium for the publication of morphological, biophysical, and biochemical investigations on cells, their components, and their products.

In short, the corpus of this study was comprised of article abstracts from two journals: Institute for Laboratory Animal Research Journal (*ILAR*) and Journal of Cell Biology (*JCB*) in the period of 2012-2014.

3.4 Designing Corpus

The abstracts from both *ILAR* and *JCB* journals were available from the Internet. This study adapted some ideas from the specialists' works in the corpus (Kaewphanngam, Broughton, & Soranastaporn, 2002). The design criteria consisted

of homogeneity of disciplines, size of corpus, availability, and variety of authors which were described as follows.

3.4.1 Homogeneity of Disciplines

The text corpus should be from unique disciplines, so the organization and linguistic features are prominent (Kaewphanngam, Broughton, & Soranastaporn, 2002).

3.4.2 Size of Corpus

In general, a size of academic text should be as large as possible to present the string findings. For classroom objectives, an appropriate corpus should include at least 100,000 running words (Kaewphanngam, Broughtom & Soranasataporn, 2002).

3.4.3 Availability

Texts for corpus should be available for all researchers and students to access because the chosen texts are as distinctive language which found in general. For this study, all abstracts are available in the internet which everyone can access them.

3.4.4 Variety of Authors

Related to academic texts, a good corpus should include any texts from a variety of authors because the corpus is not influenced by only chosen author. Thus, an abstract from each author was used to make this study.

To sum up, the corpus of laboratory and cell biology fields was from unique disciplines, and the large corpus had 100 article abstracts. This corpus came from *ILAR* and *JCB* journals, which are available for everyone to access. In addition, this corpus came from the journal abstracts written by a variety of authors.

3.5 Corpus Development

The development of corpus was the creation of two corpora: laboratory animal abstracts of review articles (*ILAR* corpus) and cell biology abstracts of research

article (*JCB* corpus) to analyze the data. The population contained 98 articles from *ILAR* journal and 520 articles from *JCB* journal in the period of 2012-2014; however, this study needed to select 50 samples per one corpus. This is because this study used the criteria based on the practice of Swales' studies which consisted of 48 articles in his corpus. To select the corpus sample, this study used two techniques: stratified random sampling and simple random sampling.

Stratified Random Sampling: As the number of article publications in each year was not equal, the stratified random sampling technique was used to determine the number of selected articles in each year shown in Table 3.2.

Table 3.2 Size of Population and Sample of ILAR Corpus and JCB Corpus

Year	ILAR		JCB	
	N	***n***	***N***	***n***
2012	40	20	180	17
2013	19	10	177	17
2014	39	20	163	16
Total	**98**	**50**	**520**	**50**

Simple Random Sampling: Then the articles in each year were selected by the simple random sampling technique. The corpus of this study comprised 696 sentences, containing 16,443 words shown in Table 3.3.

Table 3.3 Details of ILAR Corpus and JCB Corpus

Year	ILAR		JCB	
	n		***n***	
	Sentences	**Words**	**Sentences**	**Words**
2012	109	2,830	126	2,550
2013	69	1,801	120	2,681
2014	156	3,829	116	2,752
Total	334	8,460	362	7,983

The corpus contained 100 article abstracts: 50 abstracts of laboratory animal review articles and 50 abstracts of cell biology research articles. After that, all samples of abstracts were downloaded in order to create the corpus of this study. Each

abstracts was saved as word files (*.docx) in Microsoft Word 2010. Then the sentences of all abstracts were divided using Excel program for easy analysis.

3.6 Framework of Corpus Analysis

In order to explore the organization of abstracts in laboratory animal review articles and cell biology research articles, this corpus was analyzed by following the framework of Taddio et al. (1994). According to move pattern, there were eight moves: purpose, research design, setting, subjects, intervention, measurement, results, and conclusion and 33 sub-moves. To facilitate data analysis, the researcher defined codes of each move and sub-moves as shown as Table 3.4.

Table 3.4 Taddio et al.'s Move Pattern of Research Article Abstracts (8 moves)

Moves	Codes
Move 1 is about purpose, and asks:	
1 was any information on the purpose given?	M1S1
2 was the purpose explicitly stated?	M1S2
3 was the main purpose distinguished from secondary ones?	M1S3
Move 2 is limited to research design, examined with these questions:	
1 was any information on the research design given	M2S1
2 were technical descriptors used?	M2S2
3 if a follow-up study, was the duration given?	M2S3
Move 3 is setting, and described with these questions:	
1 was any information on the setting given?	M3S1
2 was the level of clinical care (e.g. primary care) indicated?	M3S2
Move 4 is subjects, the following questions are asked:	
1 was any information on the subjects given?	M4S1
2 were common demographic characteristics given?	M4S2
3 were technical descriptors of subject selection (e.g., random sample) used?	M4S3
4 was the number of subjects indicated?	M4S4
5 were the response and refusal rates indicated?	M4S5
6 was the number of dropouts and losses indicated?	M4S6
7 if the samples were matched were matching characteristics given?	M4S7

Table 3.4 Taddio et al.'s Move Pattern of Research Article Abstracts (cont.)

Move 5 is intervention, examined with these question:	
1 was any information on intervention given?	M5S1
2 were the commonest name and common synonyms given?	M5S2
3 was a description given?	M5S3
4 was the duration indicated?	M5S4
Move 6 is measurement, four questions are asked:	
1 was any information on the measures given?	M6S1
2 were the variables explicitly defined?	M6S2
3 was the source of the data given?	M6S3
4 if the measurements were subjective were the observers blinded to the patient groupings?	M6S4
Move 7 is result, which inquired to check:	
1 were any results given?	M7S1
2 were they directly related to the purpose?	M7S2
3 were appropriate numeric data given?	M7S3
4 were appropriate statistical values given?	M7S4
Move 8 is conclusion, six questions are asked:	
1 were any conclusions drawn?	M8S1
2 were they directly related to the purpose?	M8S2
3 were they consistent with the results?	M8S3
4 were the study's limitations mentioned?	M8S4
5 were the study's implications mentioned?	M8S5
6 were there recommendations for further study?	M8S6

This study used the pattern from the framework of Taddio et al. (1994) as a guideline to analyze the article abstracts in both journals, *ILAR* and *JCB* because this framework had a scientific structure. Four reasons contributed to the researcher's decision of employing this move pattern in this study. The explanations were as follows.

1. Scientific Pattern

This move pattern was structured scientifically. It included eight moves: purpose, research design, setting, subjects, intervention, measurement, results, and conclusion, according to the pattern of Taddio et al. (1994)..

2. Objective

According to the objective of the study, it aimed to explore the organization of abstracts of review articles and research articles. So, the framework of Taddio et al. (1994) can be used to be as a guideline to explore the frequency and sequence of moves.

3. Suitability

This move pattern was suitable to analyze the scientific abstracts according to two journals which in the field of science, and Taddio et al. (1994) also analyzed the medical abstracts which was classified into the field of science too.

4. Features

This move pattern gave more details and clear information in order to analyze the data and it also facilitated this study more effectively.

This study used the framework of Taddio et al. (1994) to analyze two corpora which were the abstracts of laboratory animal review articles and of cell biology research articles.

3.7 Data Analysis

This study is the analysis of the structural organization of article abstracts in the field of science. To analyze the abstracts of laboratory animal review articles and cell biology research articles, there were three steps as follows:

3.7.1 Move Identification

This process identifies the moves in the article abstracts. The data was read several times to see the overall organization of the genre. All of the sentences in the abstracts regarded as data sources were individually and categorized according to the move patterns described by Taddio et al. (1994) and entered in a table. Then each move found in the abstracts was marked. Subsequently, the moves were identified by following the framework of Taddio et al. (1994). Before identifying the moves, a coding protocol was developed. The coding protocol consisted of three main purposes: 1) to provide operational criteria for identifying the moves, 2) to provide control for coding variation, and 3) to be used to establish inter-rater reliability between the

researcher and the raters. In addition, all the sentences in each move pattern were described in both numerical and percentage terms. Finally, the data found in the tables were described in detail in the results section.

3.7.2 Inter-Rater Reliability Assessment

The use of move analysis is a complex subjective procedure, especially concerning the identification of moves and steps. Therefore, it was important to use raters other than just the researcher to establish reliability. In addition, this study used Fleiss' kappa to measure the agreement of raters. The inter-raters and the statistics of Fleiss' kappa were used to make the reliability of study, which were described as follows.

In this study, there were three raters to identify moves in the abstracts. One rater is a native-speaker in the master's degree in the field of science; he also was a former research assistant at University of Sydney. Two other raters were peer-reviewers who had studied move analysis at the master's degree level in the linguistic field at Mahidol University. Before the raters analyzed moves, the researcher explained the purpose of the study and the concepts of genre and move analysis to the raters. The researcher and the three raters were trained and practiced to analyze moves of abstracts based on the framework of Taddio et al. (1994) by the English teacher. After trainees showed their understanding and gave the correct results of move analysis, then all of them analyzed moves of 100 abstracts, individually and independently.

The raters submitted the results of move analysis to the researcher. Later, the researcher checked and compared the results. When the results were unclear or did not fall into the same move, the researcher called for a meeting with the raters to discuss in order to reach a unanimous conclusion. Moreover, the researcher consulted with the professors who were a native English speaker and the advisor in the field of linguistics to consider the disputed results.

The researcher checked the results in order to explore the move frequency, move sequences of abstracts in laboratory animal review articles and cell biology research articles. Then the move sequences were divided into the groups of move

sequences in each pattern, and each pattern was counted and recorded into the forms of move frequency and move sequences.

Then, the researcher explored the language uses of highest-frequency move in the abstracts of laboratory animal review articles and of cell biology research articles in terms of verb choices, tenses, voices, and types of sentences. After that, the researcher analyzed and summarized the language uses by using frequency and percentage.

In terms of Fleiss' kappa, it was used to measure the agreement of three raters and one researcher who classify the same sets of items. Fleiss' kappa was used when the research comprised three or more raters, also used for nominal scale. Like most correlation statistics, the Fleiss' kappa can range from -1 to +1. According to McHugh (2012), the interpretation of kappa value can be divided into six categories.

Table 3.5 Interpretation of Fleiss' Kappa McHugh (2012)

Value of Kappa	Level of Agreement	% of Data that are Reliable
0-.20	None	0-4%
.21-.39	minimal	5-15%
.40-.59	Weak	16-35%
.60-.79	moderate	36-63%
.80-.90	Strong	64-81%
Above .90	almost perfect	82-100%

In this research, the value of Fleiss' kappa was 0.8034 that means the agreement value of inter-raters was strong. It means that the identification of moves by inter-raters is high reliable.

In short, the process of inter-rater assessment is significant for this study in order to make the reliability of results. To reach this level of reliability, this study used three raters from two fields: science and linguistics.

3.7.3 Comparison of Move Analysis of Two Corpora

This step concerns the comparison of the results on move analysis between two corpora. There were two aspects as follows:

1. The aspect involved the frequency of moves in each corpus.

2. The aspect related the sequences of moves according to the analysis of move patterns based on Taddio et al. (1994). In each corpus, the sequence of moves was identified in order to establish the distinct structure of move in each corpus.

To sum up, the data analysis of this study comprised three steps in order to conduct the research. The first step of move identification was used to explore the frequency of moves, moves sequence, and language use of highest- frequency moves in each corpus. The second step of inter-rater reliability was used to establish the reliability of results. The third step of comparison related to the frequency of moves and the sequences of moves found in two corpora

3.8 Research Instrument

This study used two software programs to conduct the research.

1) Microsoft Word: The researcher used Microsoft Word to copy the contents of abstracts from PDF files which were downloaded from two websites: http://ilarjournal.oxfordjournals.org/ and http://jcb.rupress.org/. The contents of abstracts were pasted on word files in order to prepare each sentence completely and count the total number of words in each abstract shown in Figure 3.5.

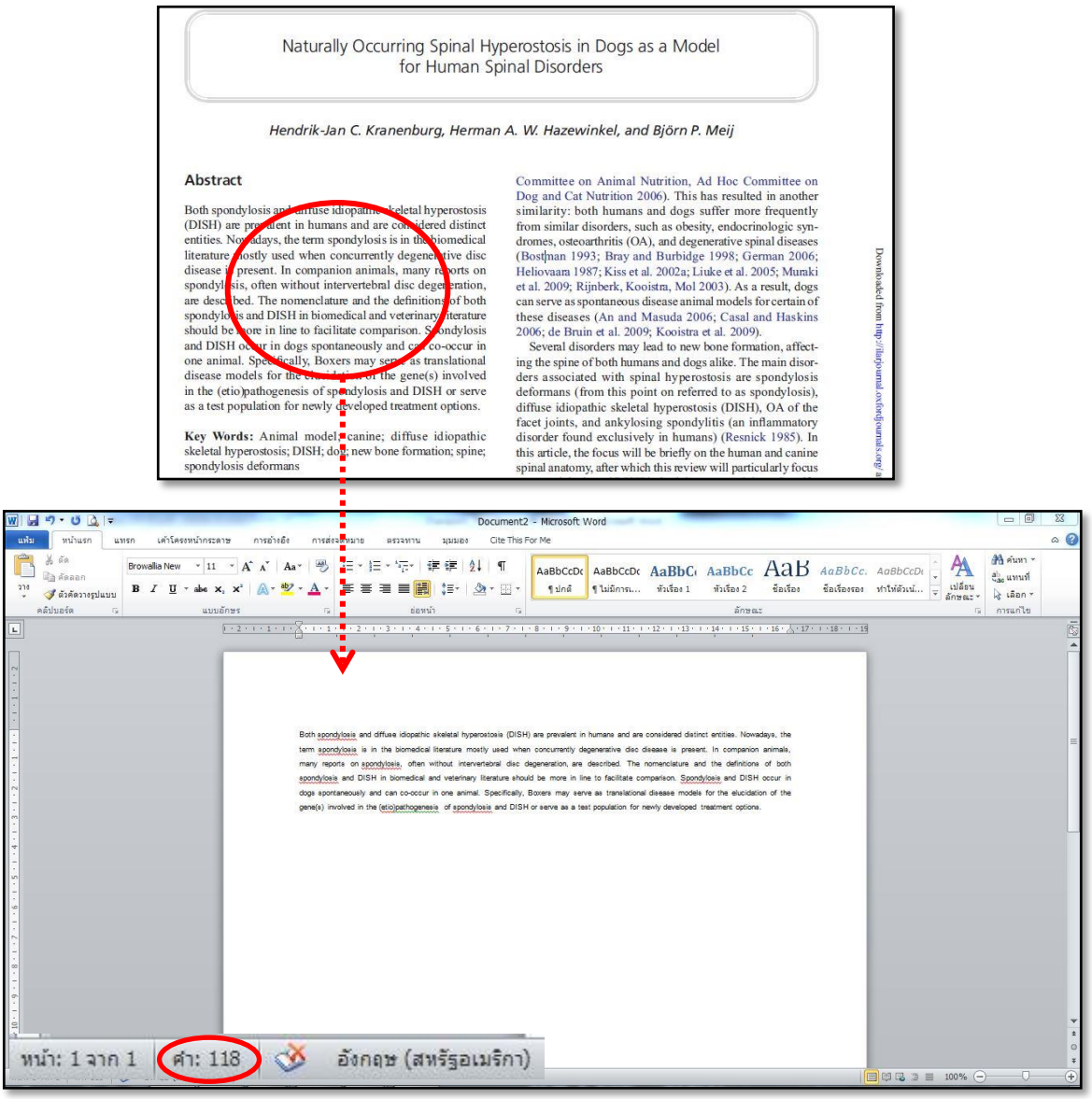
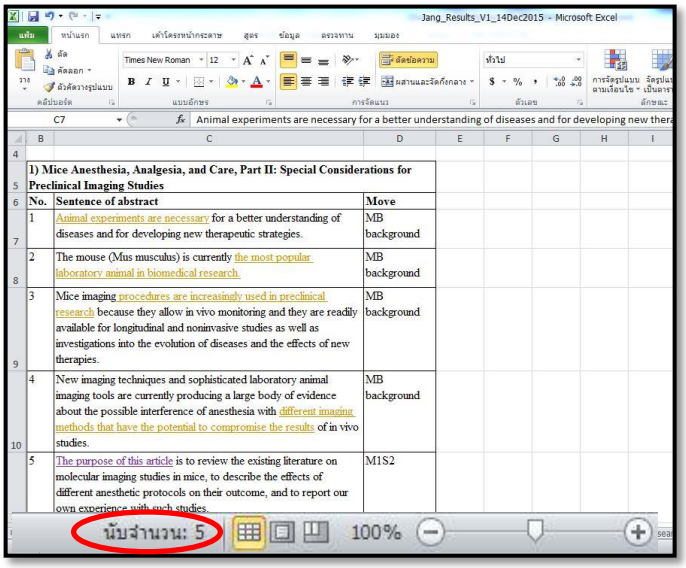


Figure 3.5 Use of Microsoft Word

2) Microsoft Excel: the researcher used Microsoft Excel to collect the data in a table for each sentence in the abstracts, the record forms of move frequency and move sequence, and counting the number of sentences, as shown in Figure 3.6.



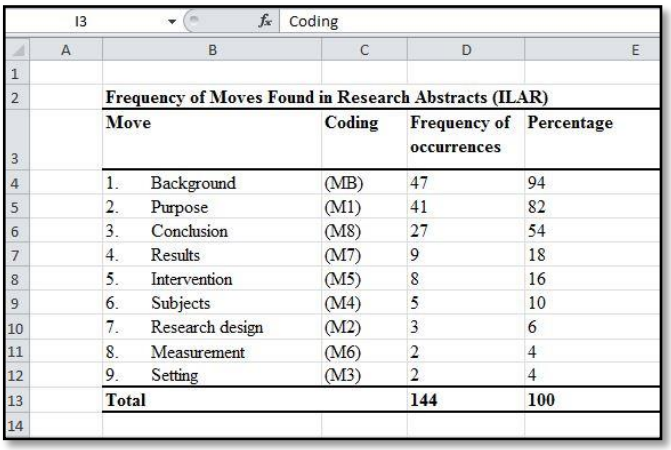
Jang_Results_V1_14Dec2015 - Microsoft Excel

C7: Animal experiments are necessary for a better understanding of diseases and for developing new thera

1) Mice Anesthesia, Analgesia, and Care, Part II: Special Considerations for Preclinical Imaging Studies		
No.	Sentence of abstract	Move
1	Animal experiments are necessary for a better understanding of diseases and for developing new therapeutic strategies.	MB background
2	The mouse (Mus musculus) is currently the most popular laboratory animal in biomedical research.	MB background
3	Mice imaging procedures are increasingly used in preclinical research because they allow in vivo monitoring and they are readily available for longitudinal and noninvasive studies as well as investigations into the evolution of diseases and the effects of new therapies.	MB background
4	New imaging techniques and sophisticated laboratory animal imaging tools are currently producing a large body of evidence about the possible interference of anesthesia with different imaging methods that have the potential to compromise the results of in vivo studies.	MB background
5	The purpose of this article is to review the existing literature on molecular imaging studies in mice, to describe the effects of different anesthetic protocols on their outcome, and to report our own experience with such studies.	M1S2

นับจำนวน: 5 100%

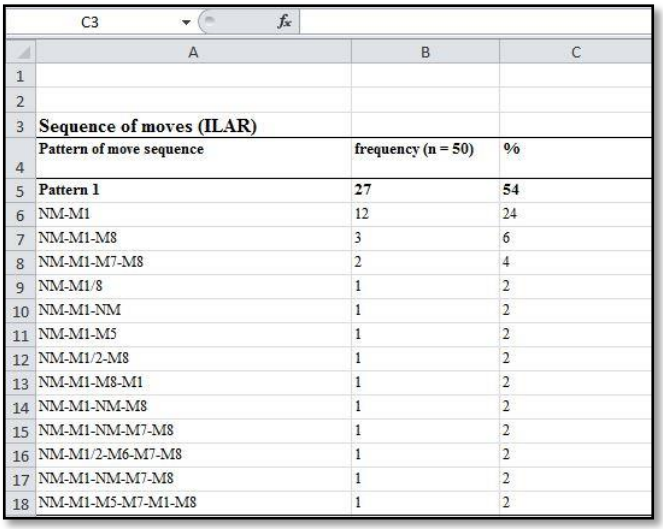
1. Table of Data Analysis and Counting the Number of Sentences



I3: Coding

Frequency of Moves Found in Research Abstracts (ILAR)			
Move	Coding	Frequency of occurrences	Percentage
1. Background	(MB)	47	94
2. Purpose	(M1)	41	82
3. Conclusion	(M8)	27	54
4. Results	(M7)	9	18
5. Intervention	(M5)	8	16
6. Subjects	(M4)	5	10
7. Research design	(M2)	3	6
8. Measurement	(M6)	2	4
9. Setting	(M3)	2	4
Total		**144**	**100**

2. Record Form of Move Frequency



C3

Sequence of moves (ILAR)		
Pattern of move sequence	frequency (n = 50)	%
Pattern 1	**27**	**54**
NM-M1	12	24
NM-M1-M8	3	6
NM-M1-M7-M8	2	4
NM-M1/8	1	2
NM-M1-NM	1	2
NM-M1-M5	1	2
NM-M1/2-M8	1	2
NM-M1-M8-M1	1	2
NM-M1-NM-M8	1	2
NM-M1-NM-M7-M8	1	2
NM-M1/2-M6-M7-M8	1	2
NM-M1-NM-M7-M8	1	2
NM-M1-M5-M7-M1-M8	1	2

3. Record Form of the Patterns of Move Sequence

Figure 3.6 Use of Microsoft Excel

3.9 Statistics

This section on statistics shows frequency and percentage, described as follows.

1. Frequency was used to calculate the numbers of moves occurred in the article abstracts in each corpus.

2. Percentage was used to calculate the data concerning the frequency of moves and the move sequences found in the article abstracts in each corpus.

In short, the statistics used in this research is descriptive statistics which were applied for frequency data and percentage.

Chapter Summary

This chapter described the research methodology employed in this study. It used data collection, the framework for data analysis, and details of data analysis. This study used four criteria to select two journals: *ILAR* and *JCB*. Before analyzing the data, the research selected the abstracts of both journals by using two techniques: stratified random sampling and simple random sampling. In addition, this study used three raters to identify moves in the abstracts. Then the research checked the results from inter-raters in order to explore frequency of moves, sequencing of moves, and language uses of move background.

CHAPTER IV
RESULTS

This chapter shows the results of this research carried on move analysis of abstracts from two types of articles, *ILAR* review articles and *JCB* research articles. In this corpus, the rhetorical moves are identified based on the framework of Taddio et al. (1994), so the elements of each move, as well as their frequency, and sequences and examples for each move are incorporated here. In addition, the language uses of highest-frequency move in the abstracts of two corpora are presented in terms of verb choices, tense, voices, and types of sentences. This study used Fleiss' kappa to measure the agreement of three raters and one researcher who classify the same sets of items. The result of Fleiss' kappa is 0.8034 showing the strong agreement of inter-raters. Therefore, the identification of moves by inter-raters is reliable. Systematically, the findings are presented to answer to four research questions:

4.1 What were the frequency and the sequence of moves in the abstracts of laboratory animal review articles from ILAR?

4.2 What were the frequency and the sequence of moves in the abstracts of cell biology research articles from JCB?

4.3 What were the similarities and differences of the frequency and the sequence of moves in the abstracts between laboratory animal review articles and cell biology research articles?

4.4 What were the language uses of the highest-frequency move found in the abstracts of laboratory animal review articles and cell biology research articles in terms of verb choices, tenses, voices, and types of sentence?

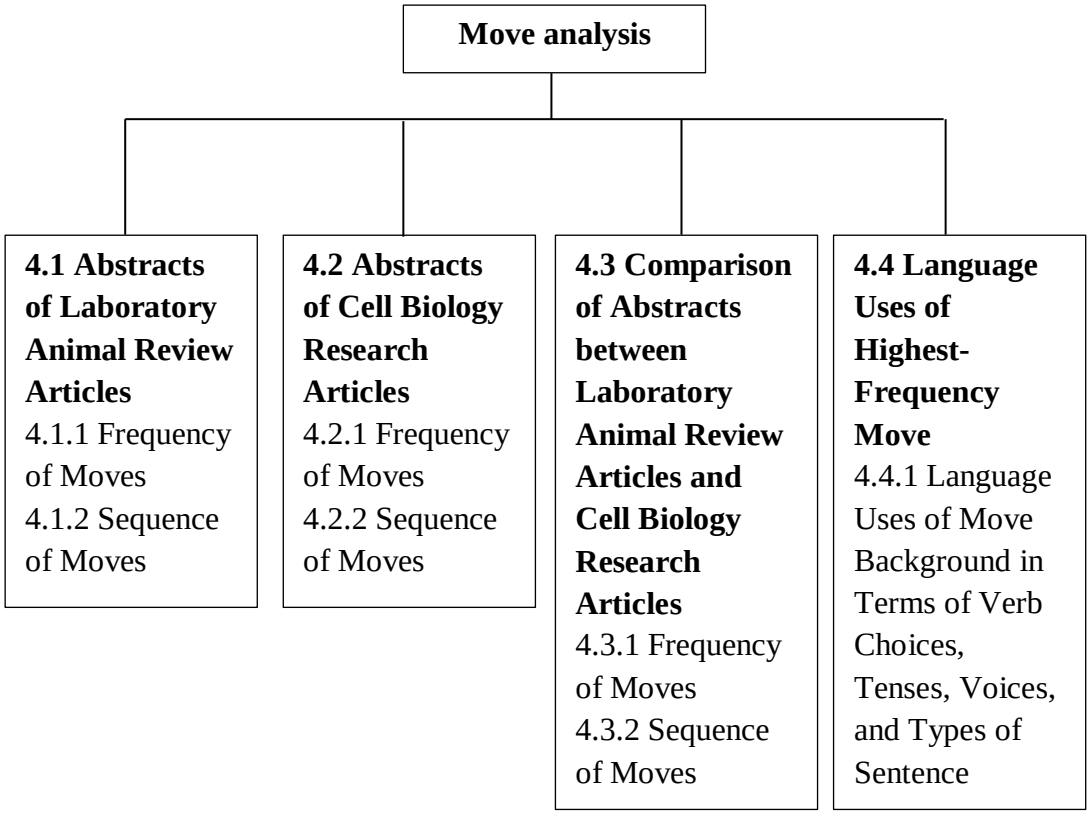


Figure 4.1 Presentation of Results

4.1 Research question 1: What were the frequency and the sequence of moves in the abstracts of laboratory animal review articles from ILAR?

At the beginning, the research started with the first question: what were the frequency and the sequence of moves in the abstracts of laboratory animal review articles from ILAR? The *ILAR* corpus comprises 50 abstracts of laboratory animal review articles, containing 334 sentences and 8,460 words. In order to answer this question, the sentences of abstracts were categorized according to the move model described by Taddio et al. (1994). The frequency and the sequence of moves found in the abstracts of *ILAR* review articles are shown in this section.

4.1.1 The Frequency of Moves in Abstracts of *ILAR* Review Articles

After analyzing the moves, the results revealed that there were 144 occurrences in all moves and nine moves in this corpus as shown in Table 4.1.

Table 4.1 Frequency of Moves Found in Review Article Abstracts of *ILAR* Corpus

	Move	Coding	*f*	%
1.	Background	(MB)*	47	94
2.	Purpose	(M1)	41	82
3.	Conclusion	(M8)	27	54
4.	Results	(M7)	9	18
5.	Intervention	(M5)	8	16
6.	Subjects	(M4)	5	10
7.	Research design	(M2)	3	6
8.	Measurement	(M6)	2	4
9.	Setting	(M3)	2	4
Total			**144**	

***** *New move: Background move*

The first move was a new move which the researcher called "*background*" and the eight moves fell into the framework of Taddio et al. (1994). The new move was found most often in the *ILAR* corpus; it occurred 47 times, or in 94% of all abstracts studied. However, "setting" appeared the least i.e. two times (4%). Based on the framework of Taddio et al. (1994), moves and sub-moves provide their functions. Examples of sentences of nine moves and sub-moves found in the abstracts of laboratory animal review articles are given below.

1) New move: Background (MB)

There were 182 sentences of MB (move background), and it occurred 47 times, or 94% of all abstracts. There were a large number of occurrences of MB that concerns the background information of the articles. Therefore, the move background was the most found in this *ILAR* corpus. The examples are as follows:

[ILAR abstract/1]

[1]*Animal experiments are necessary for a better understanding of diseases and for developing new therapeutic strategies.*

[2]The *mouse (Mus musculus) is currently the most popular laboratory animal in biomedical research.*

[3]Mice *imaging procedures are increasingly used in preclinical research because they allow in vivo monitoring and they are readily available for longitudinal and noninvasive studies as well as investigations into the evolution of diseases and the effects of new therapies.*

[4]*New imaging techniques and sophisticated laboratory animal imaging tools are currently producing a large body of evidence about the possible interference of anesthesia with different imaging methods that have the potential to compromise the results of in vivo studies.*

(Gargiulo et al., 2012)

[ILAR abstract/38]

[1]*Both spondylosis and diffuse idiopathic skeletal hyperostosis (DISH) are prevalent in humans and are considered distinct entities.*

[2]*Nowadays, the term spondylosis is in the biomedical literature mostly used when concurrently degenerative disc disease is present.*

[3]*In companion animals, many reports on spondylosis, often without intervertebral disc degeneration, are described.*

(Kranenburg, Hazewinkel, & Meij, 2014)

[ILAR abstract/49]

[1]*The question of how animal studies should be designed, conducted, and analyzed remains underexposed in societal debates on animal experimentation.*

[2]*This is not only a scientific but also amoral question.*

[3]*After all, if animal experiments are not appropriately designed, conducted, and analyzed, the results produced are unlikely to be reliable and the animals have in effect been wasted.*

(de Vries et al., 2014)

2) Move 1: Purpose

Move 1 comprised three sub-moves concerning purpose. The details of each sub-move are shown in Table 4.1.1.

Table 4.1.1 Move 1: Purpose

Move 1 is about purpose, and asks:	Code
1 was any information on the purpose given?	M1S1
2 was the purpose explicitly stated?	M1S2
3 was the main purpose distinguished from secondary ones?	M1S3

2.1) M1S1: Was any information on the purpose given?

There were 50 sentences of M1S1 (purpose), which occurred 34 times, or 68% of all abstracts. Based on Taddio et al. (1994), the authors may be concerned with 1) introducing the study by either making a descriptive statement of the study's main focus or presenting its purpose, and 2) giving a clear purpose because it made it easier to begin writing abstracts. The examples below are sentences found in the abstracts of this corpus.

[ILAR abstract/5]

This review presents a discussion of sex differences and the role of gonadal hormones as the biological basis for the sexually dimorphic pattern in behavioral responses to cocaine.

(Quinones-Jenab, & Jenab, 2012)

[ILAR abstract/7]

This article will detail some of the issues that must be considered as institutional animal care and use committees (IACUCs) review the use of nonhuman primates (NHPs) in research.

(Tardif, Coleman, Hobbs, & Lutz, 2013)

[ILAR abstract/13]

This article reviews published work relating to larval rearing and some unpublished protocols to establish optimized and standardized husbandry procedures.

(Wilson, 2012)

2.2) Move 1: Purpose, M1S2: Was the purpose explicitly stated?

There were eight sentences of M1S2 (purpose), which occurred eight times, or 16% of all abstracts. Following Taddio et al's notion (1994), authors may recognize that abstracts should start with a clear statement of the precise purpose. The examples are as follows:

[ILAR abstract/1]

The purpose of this article is to review the existing literature on molecular imaging studies in mice, to describe the effects of different anesthetic protocols on their outcome, and to report our own experience with such studies.

(Gargiulo et al., 2012)

[ILAR abstract/2]

The purpose of this article is to review the existing literature on anesthetic protocols adopted in mice for molecular imaging studies and to report our experience.

(Gargiulo et al., 2012)

[ILAR abstract/6]

This review aims to show that noninvasive brain imaging strategies such as small animal positron emission tomography offer significant potential and promise for modeling motivational disorders such as drug addiction and obesity in humans.

(Michaelides, Thanos, Volkow & Wang, 2012)

2.3) Move 1: Purpose, M1S3: Was the main purpose distinguished from secondary ones?

There were two sentences of M1S3 (purpose), and it occurred twice, or 4% of all abstracts. The examples are as follows:

[ILAR abstract/8]

This article addresses the importance of identifying and characterizing the viral diseases of zebrafish as the scope of zebrafish models expands into new research areas and also briefly addresses zebrafish susceptibility to experimental viral infection and the utility of the zebrafish as an infection and immunology model.

(Crim & Riley, 2012)

[ILAR abstract/20]

Additionally, the critical time windows for sensitivity to genetic and dietary factors both during the development of cortical networks implicated in ASDs and in regard to potential treatments are discussed.

(Schaevitz & Berger-Sweeney, 2012)

3) Move 2: Research design

Move 2 comprised three sub-moves concerning research design. The details of each sub-move are shown in Table 4.1.2.

Table 4.1.2 Move 2: Research design

Move 2 is limited to research design, examined with these questions:	Code
1 was any information on the research design given	M2S1
2 were technical descriptors used?	M2S2
3 if a follow-up study, was the duration given?	M2S3

3.1) M2S1: Was any information on the research design given?

There was only one sentence of M2S1 (research design), which occurred once, or 2% of all abstracts. The example is given below.

[ILAR abstract/31]

Using a canine model, we designed a survival study to test the feasibility of 90% hepatectomy with a portohepatic shunt.

(Steen, Conway, Guerra, Kargozaran & Gagandeep, 2012)

3.2) M2S2: Were technical descriptors used?

There were two sentences of M2S2 (research design), which occurred twice, or 4% of all abstracts. The examples are given below.

[ILAR abstract/33]

Histopathologic tools offer an unbiased way to evaluate the degree of axonal degeneration or changes in neuronal cell body but are often time consuming and require processing of the tissue after the study is completed.

(Hoke & Ray, 2014)

[ILAR abstract/42]

We designed cut-off (inclusion/exclusion) behavioral criteria (CBC) which classify study subjects as being severely, minimally or partially affected by the stress paradigm, to be applied retrospectively in the analysis of behavioral data.

(Cohen, Matar, & Zohar, 2014)

3.3) M2S3: If a follow-up study was the duration given?

M2S3 did not occur in the abstracts.

4) Move 3: Setting

Move 3 comprised two sub-moves concerning setting. The details of each sub-move are shown in Table 4.1.3.

Table 4.1.3 Move 3: Setting

Move 3 is setting, and described with these questions:	Code
1 was any information on the setting given?	M3S1
2 was the level of clinical care (e.g. primary care) indicated?	M3S2

4.1) M3S1: Was any information on the setting given?

There were two sentences of M3S1 (setting), which occurred twice, or 4% of all abstracts. The examples are given below.

[ILAR abstract/13]

Despite the increasing importance of zebrafish as a biomedical model system, there are currently no legislative guidelines or requirements for larval husbandry in the United Kingdom, the European Union, or the United States.

(Wilson, 2012)

[ILAR abstract/26]

They live exclusively in tropical rainforests in Central Africa and the islands of Southeast Asia.

(Wall, 2013)

4.2) M3S2: Was the level of clinical care (e.g., primary care) indicated?

M3S2 did not occur in the abstracts.

5) Move 4: Subjects

Move 4 comprised seven sub-moves concerning subjects. The details of each sub-move are shown in Table 4.1.4.

Table 4.1.4 Move 4: Subjects

Move 4 is subjects, the following questions are asked:	Code
1 was any information on the subjects given?	M4S1
2 were common demographic characteristics given?	M4S2
3 were technical descriptors of subject selection (e.g., random sample) used?	M4S3
4 was the number of subjects indicated?	M4S4
5 were the response and refusal rates indicated?	M4S5
6 was the number of dropouts and losses indicated?	M4S6
7 if the samples were matched were matching characteristics given?	M4S7

5.1) M4S1: Was any information on the subjects given?

There were five sentences of M4S1 (subjects), which occurred five times, or 10% of all abstracts. The examples are as follows:

[ILAR abstract/15]

These include endocrine disruptors, tobacco smoke, polycyclic aromatic hydrocarbons, infectious pathogens, particulate matter, diesel exhaust particles, dust mites, fungi, heavy metals, and other indoor and outdoor pollutants.

(Ho et al., 2012)

[ILAR abstract/30]

The vervet monkey (also called the African green monkey) is a widely used NHP model that has unique value for genetic and genomic investigations of traits relevant to human diseases.

(Jasinska et al, 2013)

5.2) M4S2: Were common demographic characteristics given?

M4S2 did not occur in the abstracts.

5.3) M4S3: Were technical descriptors of subject selection (e.g., random sample) used?

M4S3 did not occur in the abstracts.

5.4) M4S4: Was the number of subjects indicated?

There was only one sentence of M4S4 (subjects), which occurred once, or 2% of all abstracts. The example is given below.

[ILAR abstract/31]

Of eight mixed-hound canines, it was necessary to sacrifice two animals for postmortem study of hepatic anatomy; we used the results to design a procedure for removing all of the liver except portions of two lobes.

(Steen, Conway, Guerra, Kargozaran, & Gagandeep, 2012)

5.5) M4S5: Were the response and refusal rates indicated?

M4S5 did not occur in the abstracts.

5.6) M4S6: Was the number of dropouts and losses indicated?

M4S6 did not occur in the abstracts.

5.7) M4S7: If the samples were matched were matching characteristics given?

M4S7 did not occur in the abstracts.

6) Move 5: Intervention

Move 5 comprised four sub-moves concerning intervention. The details of each sub-move are shown in Table 4.1.5.

Table 4.1.5 Move 5: Intervention

Move 5 is intervention, examined with these question:	Code
1 was any information on intervention given?	M5S1
2 were the commonest name and common synonyms given?	M5S2
3 was a description given?	M5S3
4 was the duration indicated?	M5S4

6.1) M5S1: Was any information on intervention given?

There were nine sentences of M5S1 (intervention), which occurred seven times, or 14% of all abstracts. The examples are as follows:

[ILAR abstract/2]

Anesthesia must adapt to the imaging technique, the procedure length, and the aim of the study.

(Gargiulo et al., 2012)

[ILAR abstract/17]

We define this specific set of cis-acting epigenetic regulatory elements as the imprintome, a distinct and specially tasked subset of the epigenome.

(Skaar, Li, Bernal, Hoyo, Murphy, & Jirtle, 2012)

[ILAR abstract/31]

For the portohepatic shunt, we anastomosed the left portal vein branch to the left hepatic vein branch.

(Hoke & Ray, 2014)

6.2) M5S2: Were the commonest name and common synonyms given?

There was only one sentence of M5S2 (intervention), which occurred once, or 2% of all abstracts. The example is given below.

[ILAR abstract/20]

The critical role that onecarbon (C1) metabolism plays in establishing and maintaining DNA methylation patterns makes it a likely candidate pathway to regulate epigenetic processes in ASDs.

(Schaevitz & Berger-Sweeney, 2012)

6.3) M5S3: Was a description given?

There were three sentences of M5S3 (intervention), which occurred twice, or 4% of all abstracts. The example is as follows:

[ILAR abstract/17]

Imprintome elements contain DNA methylation and histone modifications that regulate monoallelic expression by affecting promoter accessibility, chromatin structure, and chromatin configuration.

(Skaar, Li, Bernal, Hoyo, Murphy, & Jirtle, 2012)

6.4) M5S4: Was the duration indicated?

M5S4 did not occur in the abstracts.

7) Move 6: Measurement

Move 6 comprised four sub-moves concerning measurement. The details of each sub-move are shown in Table 4.1.6.

Table 4.1.6 Move6: Measurement

Move 6 is measurement, four questions are asked:	Code
1 was any information on the measures given?	M6S1
2 were the variables explicitly defined?	M6S2
3 was the source of the data given?	M6S3
4 if the measurements were subjective were the observers blinded to the patient groupings?	M6S4

7.1) M6S1: Was any information on the measures given?

There were two sentences of M6S1 (measurement), which occurred twice, or 4% of all abstracts. The examples are as follows:

[ILAR abstract/31]

Assessment of liver regeneration was by weight after complete postmortem hepatectomy.

(Steen, Conway, Guerra, Kargozaran, & Gagandeep, 2012)

[ILAR abstract/34]

Behavior was measured by means of home cage observations.

(Arts, Kramer, Arndt, & Ohl, 2012)

7.2) M6S2: Were the variables explicitly defined?

There was only one sentence of M6S2 (measurement), which occurred once, or 2% of all abstracts. The example is given below.

[ILAR abstract/34]

We took blood samples to analyze plasma corticosterone and creatine kinase, and performed physiological measurements by means of telemetry, measuring heart rate, blood pressure, and activity.

(Arts, Kramer, Arndt, & Ohl, 2012)

7.3) M6S3: Was the source of the data given?

M6S3 did not occur in the abstracts.

7.4) M6S4: If the measurements were subjective were the observers blinded to the patient groupings?

M6S4 did not occur in the abstracts.

8) Move 7: Results

Move 7 comprised four sub-moves concerning results. The details of each sub-move are shown in Table 4.1.7.

Table 4.1.7 Move7: Results

Move 7 is result, which inquired to check:	Code
1 were any results given?	M7S1
2 were they directly related to the purpose?	M7S2
3 were appropriate numeric data given?	M7S3
4 were appropriate statistical values given?	M7S4

8.1) M7S1: Were any results given?

There were 12 sentences of M7S1 (results), which occurred seven times, or 14% of all abstracts. The examples are as follows:

[ILAR abstract/3]

The training protocol was successful at introducing alpacas to the metabolism pens, and it did reduce the incidence of behavioral responses to stress as the training progressed.

(Lund, Maloney, Milton, & Blache, 2012)

[ILAR abstract/18]

There are a number of in vivo models of specific pathways of carcinogenesis that are very useful for the characterization of epigenetic mechanisms that link environmental exposures or genetic susceptibility and cancer progression.

(Virani, Colacino, Kim, & Rozek, 2012)

[ILAR abstract/38]

Spondylosis and DISH occur in dogs spontaneously and can co-occur in one animal.

(Kranenburg, Hazewinkel, & Meij, 2014)

8.2) M7S2: Were they directly related to the purpose?

There were two sentences of M7S2 (results), which occurred twice, or 4% of all abstracts. The examples are as follows:

[ILAR abstract/14]

Based on the knowledge gained from studies of other animals, including traditional research models, other fish species, domesticated and companion

animals, and humans, we have proposed an approach that seeks to standardize nutrition research in zebrafish.

(Watts, Powell, & D'Abramo, 2012)

[ILAR abstract/20]

This review is the first, to our knowledge, to examine how altering C1 metabolic function through genetic and environmental factors (focusing on diet) may lead to aberrant DNA methylation and increase susceptibility to ASDs.

(Schaevitz, & Berger-Sweeney, 2012)

8.3) M7S3: Were appropriate numeric data given?

There was only one sentence of M7S3 (results), which occurred once, or 2% of all abstracts. The example is given below.

[ILAR abstract/31]

One no-shunt animal expired on the second postoperative day.

(Steen, Conway, Guerra, Kargozaran, & Gagandeep, 2012)

8.4) M7S4: Were appropriate statistical values given?

M7S4 did not occur in the abstracts.

9) Move 8: Conclusion

Move 8 comprised six sub-moves concerning conclusion. The details of each sub-move are shown in Table 4.1.8.

Table 4.1.8 Move 8: Conclusion

Move 8 is conclusion, six questions are asked:	Code
1 were any conclusions drawn?	M8S1
2 were they directly related to the purpose?	M8S2
3 were they consistent with the results?	M8S3
4 were the study's limitations mentioned?	M8S4
5 were the study's implications mentioned?	M8S5
6 were there recommendations for further study?	M8S6

9.1) M8S1: Were any conclusion drown?

There were 23 sentences of M8S1 (conclusion), which occurred 17 times, or 34% of all abstracts. The examples are as follows:

[ILAR abstract/3]

This study demonstrated that both animal welfare and the validity of the scientific outcomes could be maximized by the gradual training of experimental animals, thereby minimizing the stress imposed on the animals during experimental procedures.

(Lund, Maloney, Milton, & Blache, 2012)

[ILAR abstract/15]

We conclude that the summation of epigenetic modifications induced by multiple environmental exposures, accumulated over time, represented as broad or narrow, acute or chronic, developmental or lifelong, may provide a more precise assessment of risk and consequences.

(Ho et al., 2012)

[ILAR abstract/46]

We conclude that the NHP offers an excellent model to research mechanisms contributing to the Diathesis-Stress/Two-Hit model of depression.

(Worlein, 2014)

9.2) M8S2: Were they directly related to the purpose?

M8S2 did not occur in the abstracts.

9.3) M8S3: Were they consistent with the results?

M8S3 did not occur in the abstracts.

9.4) M8S4: Were the study's limitations mentioned

M8S4 did not occur in the abstracts.

9.5) M8S5: Were the study's implications mentioned?

There were 17 sentences of M8S5 (conclusion), which occurred 16 times, or 32% of all abstracts. The examples are as follows:

[ILAR abstract/9]

This information can be used to help plan the construction of new facilities and/or the upgrade and maintenance of existing operations.

(Lawrence, & Mason, 2012)

[ILAR abstract/11]

This information is designed to enhance understanding and facilitate collegial discussions to inform decision making about zebrafish care and use at various institutions or facilities.

(Sanders, 2012)

[ILAR abstract/27]

The authors believe that the use of MHC-defined macaques promises to improve the reproducibility, and predictability of results from pre-clinical studies for translation to humans.

(Wiseman et al., 2013)

9.6) M8S6: Were the recommendations for further study?

There were 10 sentences of M8S6 (conclusion), which occurred eight times, or 16% of all abstracts. The examples are as follows:

[ILAR abstract/14]

The long term-goal of nutrition research will be to identify the daily nutritional requirements of the zebrafish and to develop appropriate standardized reference and open formulation diets.

(Watts, Powell, & D'Abramo, 2012)

[ILAR abstract/15]

Future investigations may focus on their use as readouts or biomarkers of the totality of past exposure for the prediction of future disease risk and the prescription of effective countermeasures.

(Ho et al., 2012)

[ILAR abstract/34]

Researchers must be aware of this impact and provide a sufficient acclimatization period to allow for the (re-)stabilization of parameters.

(Art, Kramer, Arndt, & Ohl, 2012)

The above instances demonstrate the moves and sub-moves found in the *ILAR* corpus. However, a set of nine moves was not always used in the abstracts. Move B

(background), Move 1 *(purpose)*, and Move 8 *(conclusion)* were found to be more frequent than the others.

4.1.2 The Sequence of Moves in Abstracts of *ILAR* Review Articles

The patterns of move sequence are diverse in the *ILAR* abstracts. There were ten patterns of move sequence consisting of nine moves: "background" (MB), "purpose" (M1), "research design" (M2), "setting" (M3), "subjects" (M4), "intervention" (M5), "measurement" (M6), "results" (M7) and "conclusion" (M8). In the abstracts, each move can occur more than once, and one sentence can include more than one move. Table 4.2 shows the patterns of move sequence of abstracts in laboratory animal review article.

Table 4.2 Move Sequence of Abstracts in ILAR Review Articles

Pattern of move sequence	*f* (n = 50)	%
Pattern 1 MB-M1 other moves and M8	**27**	**54**
MB-M1	12	24
MB-M1-M8	3	6
MB-M1-M7-M8	2	4
MB-M1/8	1	2
MB-M1-MB	1	2
MB-M1-M5	1	2
MB-M1/2-M8	1	2
MB-M1-M8-M1	1	2
MB-M1-MB-M8	1	2
MB-M1-MB-M7-M8	1	2
MB-M1/2-M6-M7-M8	1	2
MB-M1-MB-M7-M8	1	2
MB-M1-M5-M7-M1-M8	1	2
Pattern 2 MB-M8 and other moves	**7**	**14**
MB-M8	5	10
MB-M8-M1	1	2
MB-M8-M7-M8	1	2
Pattern 3 MB-M5 and other moves	**4**	**8**
MB-M5-M1	1	2
MB-M5-MB-M8	1	2
MB-M5-M2/8-M8	1	2
MB-M5-MB /5-M1-M8	1	2
Pattern 4 MB-M4 and other moves	**3**	**6**
MB-M4-M1	1	2
MB-M4/MB-M1	1	2
MB-M4-M1-M1/8	1	2
Pattern 5 MB-M3 and other moves	**2**	**4**
MB-M3-MB-M1	1	2
MB-M3-MB/4-M1	1	2
Pattern 6 MB-M6 and other moves	**2**	**4**
MB-M2-M8-M1	1	2
MB-M2-M4/2-M5-M6-M5-M7-M8	1	2
Pattern 7 MB-M7 and other moves	**1**	**2**
MB-M7-M1/7-M1/8-NM/1/8	1	2
Pattern 8 M1-M8	**2**	**4**
M1-M8	2	4
Pattern 9 M1-MB-M8	**1**	**2**
M1- MB-M8	1	2
Pattern 10 M1-M4-M8	**1**	**2**
M1-M4-M8	1	2
Total	**50**	**100**

Note: M1/8 = Move 8 embeds in Move 1

Table 4.2 illustrated that the pattern 1 was found the most in the *ILAR* abstracts, or it occurred 54% of all abstracts. The pattern1-8 in *ILAR* abstracts began with MB concerning "background information", but the second move of each pattern is different. For instance, the second move of pattern 1 is "purpose" (M1). The second move of pattern 2 is "conclusion" (M8). The second move of pattern 3 is "intervention" (M5). The second move of pattern 4 is "subjects" (M4). The second move of pattern 5 is "setting" (M3). The second move of pattern 6 is "conclusion" (M8). The second move of pattern 7 is "results" (M7). However, the pattern 8-10 differed from pattern 1-7 because they began with "purpose" (M1). The examples of each pattern are given below.

Pattern 1: MB-M1 other moves and M8

In pattern 1, there were 27 abstracts, which were 54% of all abstracts. The example is as follow:

[ILAR abstract/6]

Background = S1-3

[1]The use of translational noninvasive neuroimaging has revealed that drug addiction and obesity share striking similarities in functional impairment in discrete brain regions and neurotransmitter circuits. [2]Imaging experiments in both humans and rodents (using complementary experimental designs) show similar abnormalities in brain glucose metabolism in the prefrontal cortex (involved in inhibitory control) and hippocampus (memory) as well as impairments in dopamine signaling in the striatum (involved in food and drug reward, goal orientation, motivation, and habit formation). [3]In both species, many of these observations have been obtained through concurrent and parallel monitoring of both brain activity and behavioral manifestations during drug administration, food sensory (visual, olfactory) stimulation, and craving.

Purpose = S4

[4]This review aims to show that noninvasive brain imaging strategies such as small animal positron emission tomography offer significant potential and promise for modeling motivational disorders such as drug addiction and obesity in humans.

Conclusion = S5

[5]Rodent addiction models will prove valuable for understanding brain responses to drug cues and will help guide treatment, especially in relapse situations triggered by exposure to conditioned drug cues.

(Michaelides, Thanos, Volkow, N., & Wang, 2012)

Pattern 2: MB-M5 and other moves

In pattern 2, there were seven abstracts, which were 14% of all abstracts. The example is as follow:

[ILAR abstract/22]

Background = S1-4

[1]The study of wildlife, whether in the field or in the lab, may start with a hypothesis, a literature search, or a grant proposal, but in many cases, the work will never happen unless the researcher successfully navigates a maze of permit requirements. [2]A single project can involve multiple permits at the national and state levels, and it can take months to obtain any one permit. [3]Therefore, permits may not have been issued at the time of protocol review, but Public Health Service Policy makes accommodations for this situation. [4]Once in hand, however, the permits convey critical information to the Institutional Animal Care and Use Committee (IACUC): one or more government agencies have determined that the activity will not be detrimental to the population or that any detriment is justified by the scientific knowledge that will be generated.

Conclusion = S5

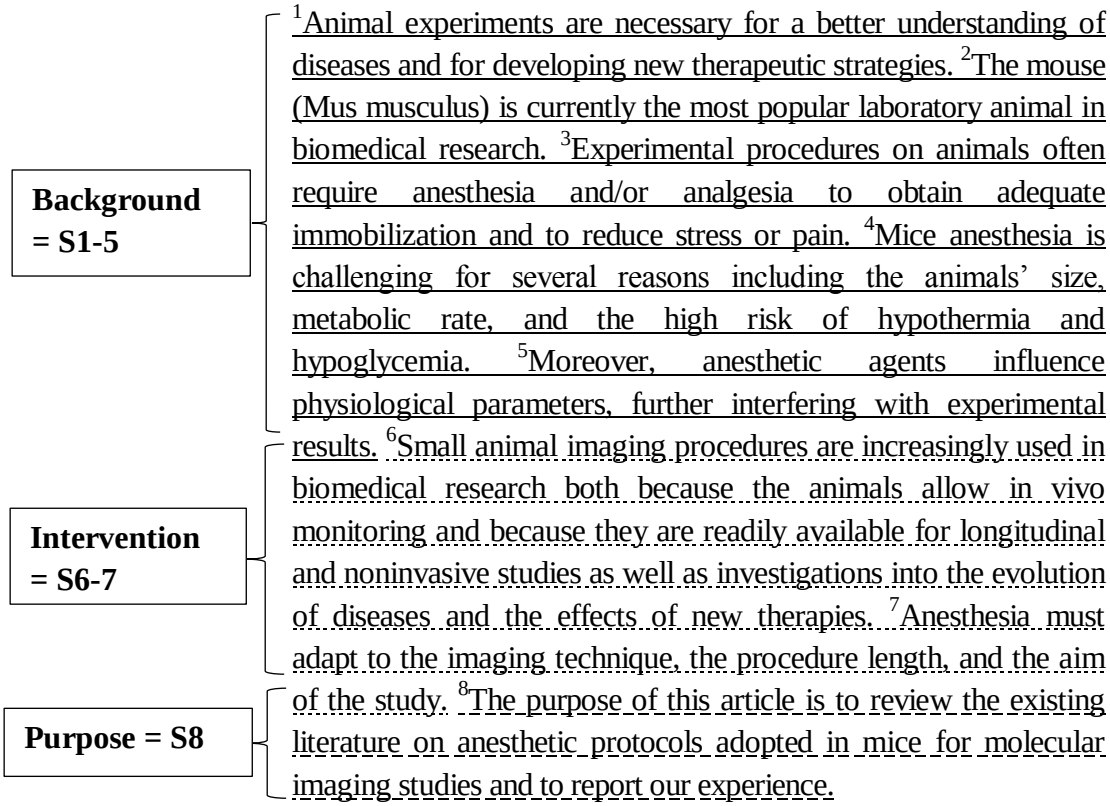
[5]This paper assumes that IACUCs are reviewing all wildlife protocols involving live vertebrates, regardless of the current, albeit temporary, distinction made by Animal and Plant Health Inspection Service Animal Care with regard to birds.

(Paul & Silkes, 2013)

Pattern 3: MB-M5 and other moves

In pattern 3, there were four abstracts, which were 8% of all abstracts. The example is as follow:

[ILAR abstract/2]



(Gargiulo et al., 2012)

Pattern 4: MB-M4 and other moves

In pattern 4, there were three abstracts, which were 6% of all abstracts. The example is as follow:

[ILAR abstract/32]

Background = S1-5

[1]A major challenge for understanding susceptibility to common human diseases is determining genetic and environmental factors that influence mechanisms underlying variation in disease-related traits. [2]The most common diseases afflicting the US population are complex diseases that develop as a result of defects in multiple genetically controlled systems in response to environmental challenges. [3]Unraveling the etiology of these diseases is exceedingly difficult because of the many genetic and environmental factors involved. [4]Studies of complex disease genetics in humans are challenging because it is not possible to control pedigree structure and often not practical to control environmental conditions over an extended period of time. [5]Furthermore, access to tissues relevant to many diseases from healthy individuals is quite limited.

Subject = S6-7

[6]The baboon is a well-established research model for the study of a wide array of common complex diseases, including dyslipidemia, hypertension, obesity, and osteoporosis. [7]It is possible to acquire tissues from healthy, genetically characterized baboons that have been exposed to defined environmental stimuli.

Purpose = S8-10

[8]In this review, we describe the genetic and physiologic similarity of baboons with humans, the ability and usefulness of controlling environment and breeding, and current genetic and genomic resources. [9]We discuss studies on genetics of heart disease, obesity, diabetes, metabolic syndrome, hypertension, osteoporosis, osteoarthritis, and intrauterine growth restriction using the baboon as a model for human disease. [10]We also summarize new studies and resources under development, providing examples of potential translational studies for targeted interventions and therapies for human disease.

(Cox et al., 2013)

Pattern 5: MB-M3 and other moves

In pattern 5, there were two abstracts, which were 4% of all abstracts. The example is as follow:

[ILAR abstract/13]

Background S1-2	[1]Fish—and zebrafish (Danio rerio) in particular—are now the second-most used biomedical model in the United Kingdom. [2]The use of fish in research rose by 23% in 2011, primarily reflecting a rise in the use of zebrafish.
Setting = S3	[3]Despite the increasing importance of zebrafish as a biomedical model system, there are currently no legislative guidelines or requirements for larval husbandry in the United Kingdom, the European Union, or the United States.
Background = S4	[4]This has led to a variety of procedures and methods being developed for larval rearing, many of which are not derived from peer-reviewed protocols.
Purpose = S5	[5]This article reviews published work relating to larval rearing and some unpublished protocols to establish optimized and standardized husbandry procedures.

(Wilson, 2012)

Pattern 6: MB-M2 and other moves

In pattern 6, there were two abstracts, which were 4% of all abstracts. The example is as follow:

[ILAR abstract/42]

Background = S1-3

[1]The diagnosis of Post-Traumatic Stress Disorder (PTSD) is conditional on directly experiencing or witnessing a significantly threatening event and the presence of a certain minimal number of symptoms from each of four symptom clusters (re-experiencing, avoidance, negative cognition and mood, and hyperarousal) at least one month after the event (DSM5) (American Psychiatric Association 2013). [2]Only a proportion of the population exposed develops symptoms fulfilling the criteria. [3]The individual heterogeneity in responses of stress-exposed animals suggested that adapting clearly defined and reliably reproducible "diagnostic", i.e. behavioral, criteria for animal responses would augment the clinical validity of the analysis of study data.

Research design = S4

[4]We designed cut-off (inclusion/exclusion) behavioral criteria (CBC) which classify study subjects as being severely, minimally or partially affected by the stress paradigm, to be applied retrospectively in the analysis of behavioral data.

Conclusion = S5-6

[5]Behavioral response classification enables the researcher to correlate (retrospectively) specific anatomic, bio-molecular and physiological parameters with the degree and pattern of the individual behavioral response, and also introduces "prevalence rates" as a valid study parameter. [6]The cumulative results of our studies indicate that, by classifying the data from individual subjects according to their response patterns, the animal study can more readily be translated into clinical "follow-up" studies and back again.

Purpose = S7

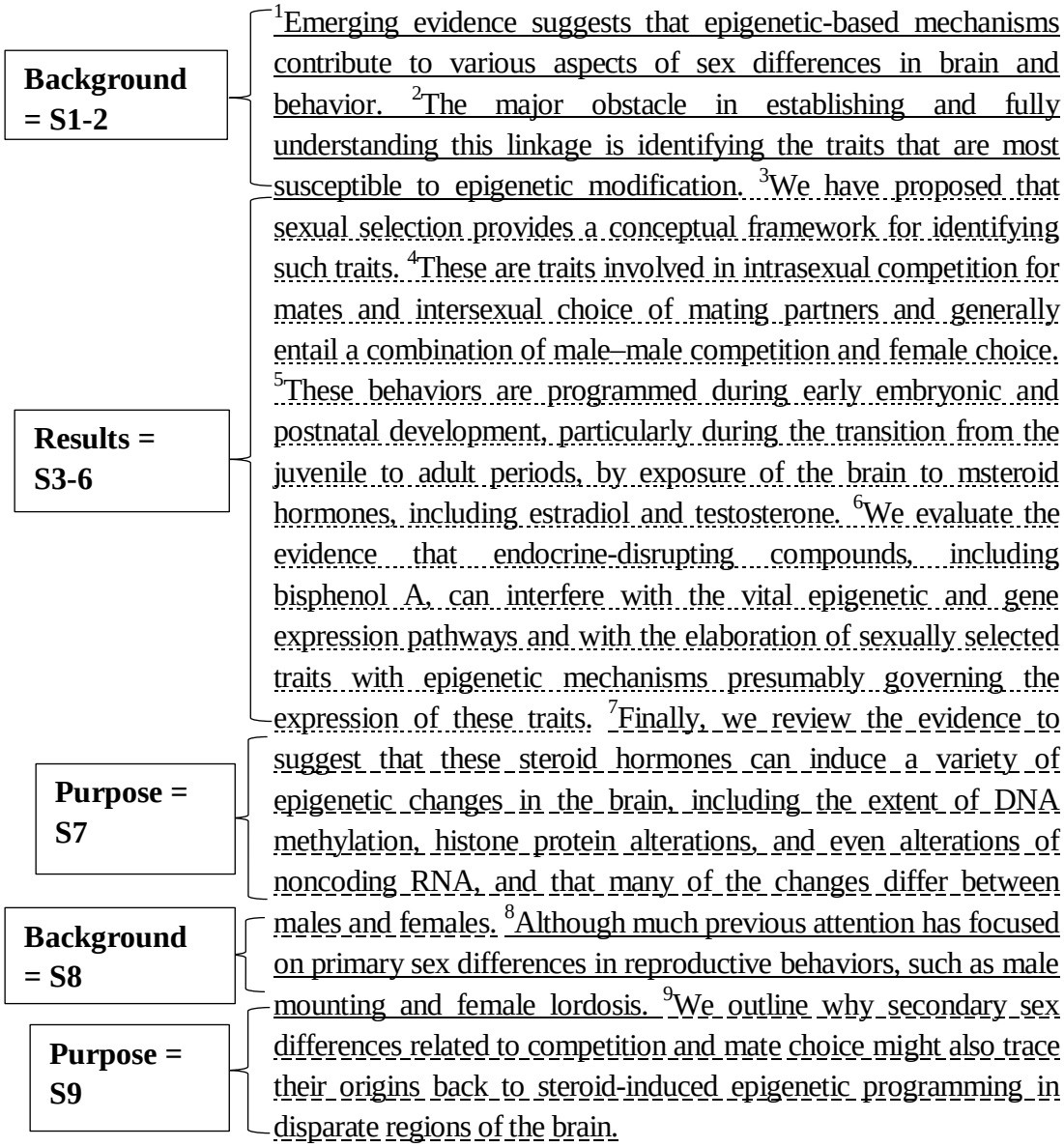
[7]This article will discuss the concept of the model and its background, and present a selection of studies employing and examining the model, alongside the underlying translational rationale of each.

(Cohen, Matar, & Zohar, 2014)

Pattern 7: MB-M7 and other moves

In pattern 7, there was one abstract, which were 2% of all abstracts. The example is as follow:

[ILAR abstract/21]

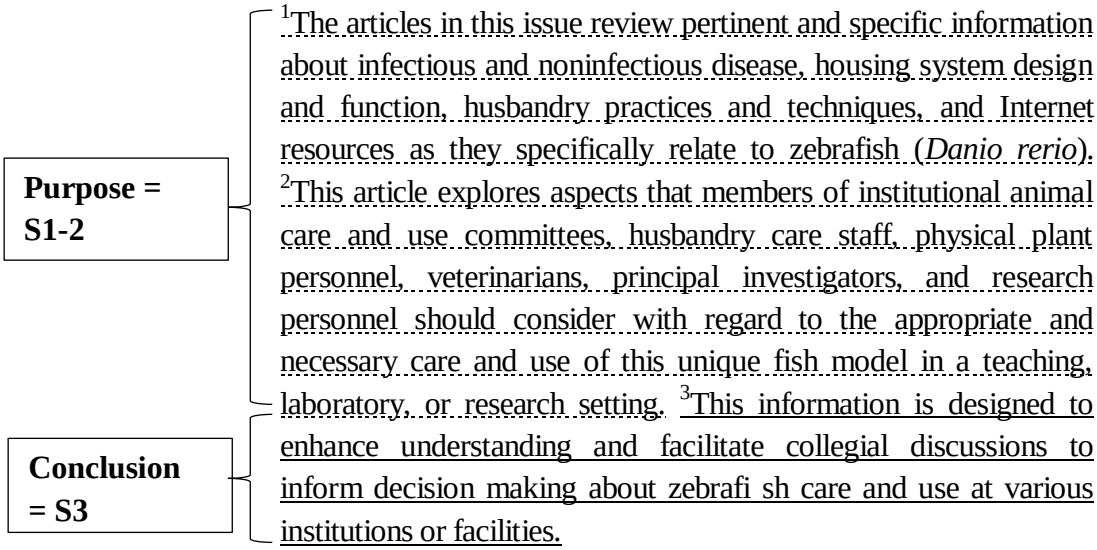


(Jasarevic, Geary, & Rosenfeld, 2012)

Pattern 8: M1-M8 and other moves

In pattern 8, there were two abstracts, which were 4% of all abstracts. The example is as follow:

[ILAR abstract/19]

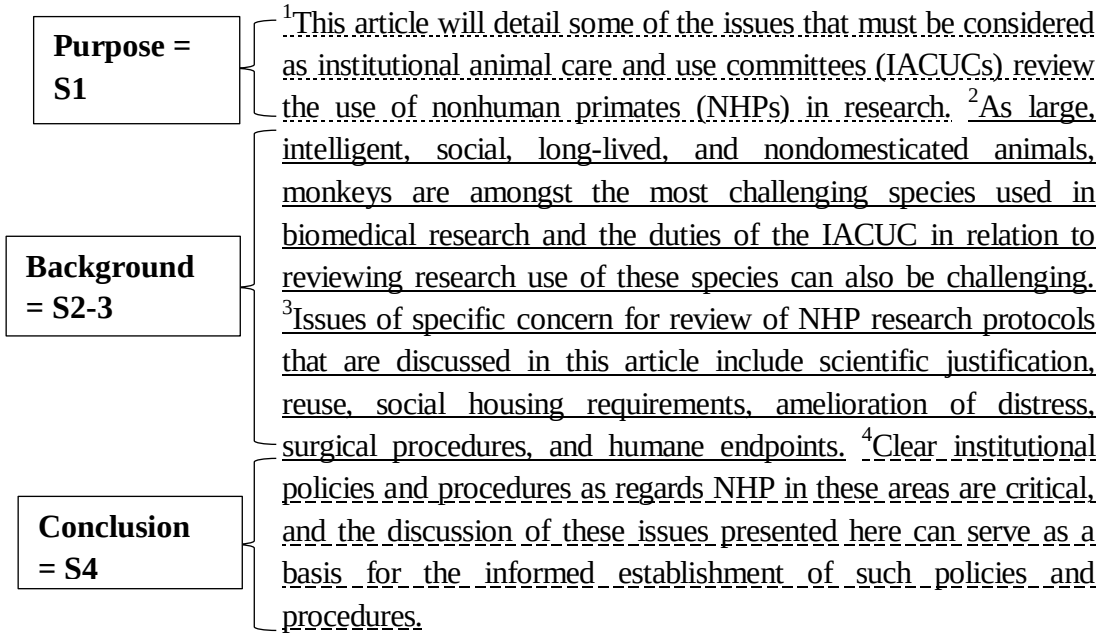


(Michaelides, Thanos, Volkow, & Wang, 2012)

Pattern 9: M1-MB and other moves

In pattern 9, there was one abstract, which was 2% of all abstracts. The example is as follow:

[ILAR abstract/7]

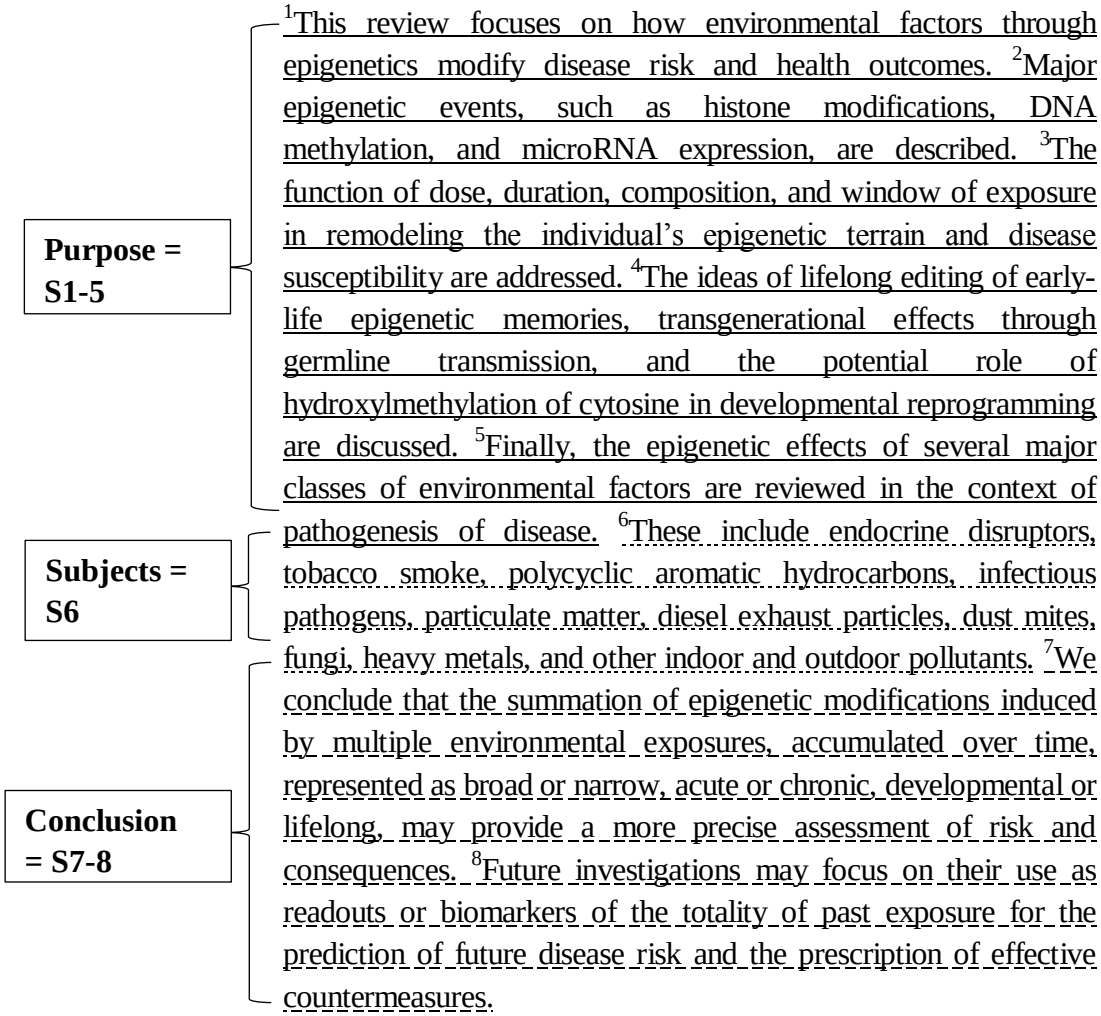


(Tardif, Coleman, Hobbs, & Lutz, 2013)

Pattern 10: M1-M4 and other moves

In pattern 10, there was one abstract, which was 2% of all abstracts. The example is as follow:

[ILAR abstract/15]



(Ho et al., 2012)

In short, the abstracts of laboratory animal review articles consisted of nine moves: *background, purpose, research design, setting, subjects, intervention, measurement, results,* and *conclusion*. The first move was a new move (background) which was the most frequently found in this corpus, and the eight moves followed the framework of Taddio et al. (1994). Based on their occurrences, moves B (*background*), move 1 (*purpose*) and move 8 (*conclusion*) played an integral role in the abstracts. In contrast, move 7 (*results*), move 5 (*intervention*), move 4 (*subjects*), move 2 (*research designs*), move 6 (*measurement*), and move 3 (*settings*) were the least frequent. In addition, the *ILAR* corpus found ten patterns of move sequences which consisted of nine moves, and 94% of abstracts began with *'move background'*. However, each abstract contained the different moves, and the move sequences were diverse. Consequently, the pattern of moves in abstracts of *ILAR* review articles comprised nine moves which were sequenced differently in each abstract.

4.2 Research question 2: What were the frequency and the sequence of moves in the abstracts of cell biology research articles from JCB?

To answer the second question: what were the frequency and the sequence of moves in the abstracts of cell biology research articles from JCB? The *JCB* corpus comprises 50 research articles abstracts, containing 362 sentences and 7,983 words. In order to respond to this question, the sentences of abstracts were categorized according to the move pattern described by Taddio et al. (1994). In this section, the frequency and the sequence of moves found in abstracts of *JCB* research articles are presented into two sections.

4.2.1 The Frequency of Moves in Abstracts of *JCB* Research Articles

From move analysis, the result revealed 203 occurrences of all moves and seven moves in this corpus, as shown in Table 4.3.

Table 4.3 Frequency of Moves Found in Research Article Abstracts of *JCB* Corpus

	Move	Coding	*f*	%
1.	Background	(MB)	49	98
2.	Conclusion	(M8)	48	96
3.	Results	(M7)	47	94
4.	Purpose	(M1)	30	60
5.	Research design	(M2)	11	22
6.	Subjects	(M4)	3	6
7.	Intervention	(M5)	3	6
8.	Measurement	(M6)	0	0
9.	Setting	(M3)	0	0
Total			**203**	

***** *New move: Background move*

The first move was a new move which the researcher called "*background*", and the six moves fell into the framework of Taddio et al. (1994). The new move was found most often in this corpus; it occurred 49 times, or in 98% of all abstracts studied. However, "measurement" and "setting" did not appear in the corpus. Based on the framework of Taddio et al. (1994), moves and sub-moves provide the functions of each move and sub-move. Examples of sentences of each move found in the abstracts of cell biology research articles are given below.

1) New move: Background (MB)

There were 97 sentences of MB (move background), which occurred 49 times, or 98% of all abstracts. There were a large number of occurrences of MB that concerns the background information of the articles. Therefore, the move background was the most found in this *JCB* corpus. The examples are as follows:

[JCB abstract/1]

[1]*The endoplasmic reticulum (ER) provides an environment optimized for oxidative protein folding through the action of Ero1p, which generates disulfide bonds, and Pdi1p, which receives disulfide bonds from Ero1p and transfers them to substrate proteins.*

[2]*Feedback regulation of Ero1p through reduction and oxidation of regulatory bonds within Ero1p is essential for maintaining the proper redox balance in the ER.*

(Kim, Sideris, Sevier, & Kaiser, 2012)

[JCB abstract/36]

[1] *Myocardin (Myocd) and Myocd-related transcription factors (MRTFs) are robust coactivators of serum response factor (SRF).*

[2] *RPEL motifs are monomeric globular actin (G-actin) binding elements that regulate MRTF localization and activity.*

[3] *However, the function of the RPEL motif in Myocd is largely unknown because of its low affinity for G-actin.*

(Morita, & Hayashi, 2014)

[JCB abstract/44]

[1]*Segregation of genetic material occurs when chromosomes move to opposite spindle poles during mitosis.*

[2] *This movement depends on K-fibers, specialized microtubule (MT) bundles attached to the chromosomes' kinetochores.*

[3]*A long-standing assumption is that continuous K-fibers connect every kinetochore to a spindle pole and the force for chromosome movement is produced at the kinetochore and coupled with MT depolymerization.*

(Sikirzhytsk et al., 2014)

2) Move 1: Purpose

Move 1 comprised three sub-moves concerning purpose. The details of each sub-move are shown in Table 4.3.1.

Table 4.3.1 Move 1: Purpose

Move 1 is about purpose, and asks:
1 was any information on the purpose given?
2 was the purpose explicitly stated?
3 was the main purpose distinguished from secondary ones?

2.1) M1S1: Was any information on the purpose given?

There were 29 sentences of M1S1 (purpose), which occurred 27 times, or 57% of all abstracts. Based on Taddio et al. (1994), the authors may be concerned with 1) introducing the study by either making a descriptive statement of the study's main focus or presenting its purpose, and 2) giving a clear purpose because it made it easier to

begin writing abstracts. The examples below are sentences found in the abstracts of this corpus.

[JCB abstract/3]

In this paper, we investigate chromosome dynamics in living animals through high-resolution four-dimensional fluorescence imaging and quantitative motion analysis.

(Wynne, Rog, Carlton, & Dernburg, 2012)

[JCB abstract/10]

Here we investigate the physiological and cellular functions of mitochondrial division in postmitotic neurons using in vivo and in vitro gene knockout for the mitochondrial division protein Drp1.

(Kageyama, et al., 2012)

[JCB abstract/14]

In this paper, we describe how a dynamic regulatory process is necessary to restrict microvilli to the apical aspect of polarized epithelial cells.

(Viswanatha, Ohouo, Smolka, & Bretscher, 2012)

2.2) M1S2: Was the purpose explicitly stated?

There were four sentences of M1S2 (purpose), which occurred four times, or 8% of all abstracts. Following Taddio et al's notion, authors may recognize that abstracts should start with a clear statement of the precise purpose. The examples are as follows:

[JCB abstract/4]

Here we investigate the molecular basis of the abnormal behavior of Hectd1 mutant cranial mesenchyme.

(Sarkar, & Zohn, 2012)

[JCB abstract/9]

Here we identify a mechanism by which the Netrin receptor UNC-40/DCC instructs synaptic vesicle clustering in vivo.

(Stavoe, & Colon-Ramos, 2012)

[JCB abstract/22]

Here, we systematically address the function of each dynein–dynactin subunit and adaptor protein in mitosis.

(Raaijmakers, Tanenbaum, & Medema, 2013)

2.3) M1S3: Was the main purpose distinguished from secondary ones?

M1S3 did not occur in the abstracts.

3) Move 2: Research design

Move 2 comprised three sub-moves concerning research design. The details of each sub-move are shown in Table 4.3.2.

Table 4.3.2 Move 2: Research design

Move 2 is limited to research design, examined with these questions:	Code
1 was any information on the research design given	M2S1
2 were technical descriptors used?	M2S2
3 if a follow-up study, was the duration given?	M2S3

3.1) M2S1: Was any information on the research design given?

There were five sentences of M2S1 (research design), which occurred four times, or 8% of all abstracts. The example is given below.

[JCB abstract/17]

We identified the mother centriolar protein ODF2 as an interaction partner of MARK4 and showed that ODF2 localization to the centriole partially depended on MARK4.

(Kuhns et al., 2013)

[JCB abstract/18]

Using this system, we created two distinct types of engineered kinetochores, both of which were stably maintained in chicken DT40 cells.

(Hori, Shang, Takeuchi, & Fukagawa, 2012)

[JCB abstract/20]

In this paper, using a cell-free system that recapitulates end synapsis and DNA-PKcs autophosphorylation, we found a defect in both activities in human cell extracts lacking LIG4.

(Mohammadi, & Isberg, 2013)

3.2) M2S2: Were technical descriptors used?

There were eight sentences of M2S2 (research design), which occurred eight times, or 16% of all abstracts. The examples are given below.

[JCB abstract/14]

Using molecular homology modeling for Tob55 and cryoelectron microscopy reconstructions of the TOB complex, we present a model of the TOB–SAM complex that integrates biochemical and structural data.

(Viswanatha, Ohouo, Smolka, & Bretscher, 2012)

[JCB abstract/18]

Here, we used a unique chromosome-engineering system in which kinetochore proteins are targeted to a noncentromeric site after the endogenous centromere is conditionally removed.

(Hori, Shang, Takeuchi, & Fukagawa, 2012)

[JCB abstract/29]

To ensure that invading pathogens are captured and degraded, Atg16L1 targeting is secured by two backup systems that anchor Atg16L1 to ubiquitin-decorated endosomes.

(Fujita et al., 2013)

3.3) M2S3: If a follow-up study was the duration given?

M2S3 did not occur in the abstracts.

4) Move 3: Setting

Move 3 comprised two sub-moves concerning setting. The details of each sub-move are shown in Table 4.3.3.

Table 4.3.3 Move 3: Setting

Move 3 is setting, and described with these questions:	**Code**
1 was any information on the setting given?	M3S1
2 was the level of clinical care (e.g. primary care) indicated?	M3S2

4.1) M3S1: Was any information on the setting given?

M3S1 did not occur in the abstracts.

4.2) M3S2: Was the level of clinical care (e.g., primary care) indicated?

M3S2 did not occur in the abstracts.

5) Move 4: Subjects

Move 4 comprised seven sub-moves concerning subjects. The details of each sub-move are shown in Table 4.3.4.

Table 4.3.4 Move 4: Subjects

Move 4 is subjects, the following questions are asked:	Code
1 was any information on the subjects given?	M4S1
2 were common demographic characteristics given?	M4S2
3 were technical descriptors of subject selection (e.g., random sample) used?	M4S3
4 was the number of subjects indicated?	M4S4
5 were the response and refusal rates indicated?	M4S5
6 was the number of dropouts and losses indicated?	M4S6
7 if the samples were matched were matching characteristics given?	M4S7

5.1) M4S1: Was any information on the subjects given?

There were two sentences of M4S1 (subjects), which occurred twice, or 4% of all abstracts. The examples are as follows:

[JCB abstract/48]

In the Drosophila melanogaster sensory bristle lineages, Numb inhibits the recycling of Notch and its trafficking partner Sanpodo (Spdo) to regulate cell fate after asymmetric cell division.

(Couturier, Trylinski, Mazouni, Darnet, & Schweisguth, 2014)

[JCB abstract/49]

In this paper, we have used small interfering RNAs or morpholino oligonucleotides to deplete the LICs in human cell lines and Xenopus laevis early embryos to dissect the LICs' role in cell division.

(Jones et al., 2014)

5.2) M4S2: Were common demographic characteristics given?

M4S2 did not occur in the abstracts.

5.3) M4S3: Were technical descriptors of subject selection (e.g., random sample) used?

There was only one sentence of M4S3 (subjects), which occurred once, or 2% of all abstracts. The example is given below.

[JCB abstract/38]

We identified a discrete number of phospho-proteins including the S6 ribosomal protein (S6rp), which is down-regulated at the onset of myelination, and N-myc downstream-regulated gene-1 (NDRG1), which is up-regulated strikingly with myelination.

(Heller et al., 2014)

5.4) M4S4: Was the number of subjects indicated?

M4S4 did not occur in the abstracts.

5.5) M4S5: Were the response and refusal rates indicated?

M4S5 did not occur in the abstracts.

5.6) M4S6: Was the number of dropouts and losses indicated?

M4S6 did not occur in the abstracts.

5.7) M4S7: If the samples were matched were matching characteristics given?

M4S7 did not occur in the abstracts.

6) Move 5: Intervention

Move 5 comprised four sub-moves concerning intervention. The details of each sub-move are shown in Table 4.3.5.

Table 4.3.5 Move 5: Intervention

Move 5 is intervention, examined with these question:	Code
1 was any information on intervention given?	M5S1
2 were the commonest name and common synonyms given?	M5S2
3 was a description given?	M5S3
4 was the duration indicated?	M5S4

6.1) M5S1: Was any information on intervention given?

There were seven sentences of M5S1 (intervention), which occurred thrice, or 6% of all abstracts. The examples are as follows:

[JCB abstract/10]

[1]*When mouse Drp1 was deleted in postmitotic Purkinje cells in the cerebellum, mitochondrial tubules elongated due to excess fusion, became large spheres due to oxidative damage, accumulated ubiquitin and mitophagy markers, and lost respiratory function, leading to neurodegeneration.*

[2] *Ubiquitination of mitochondria was independent of the E3 ubiquitin ligase parkin in Purkinje cells lacking Drp1.*

[3]*Treatment with antioxidants rescued mitochondrial swelling and cell death in Drp1KO Purkinje cells.*

[4]*Moreover, hydrogen peroxide converted elongated tubules into large spheres in Drp1KO fibroblasts.*

(Kageyama et al., 2012)

[JCB abstract/17]

In this paper, a functional RNA interference–based screen linked 30 novel protein kinases with ciliogenesis.

(Kuhns et al., 2013)

[JCB abstract/29]

[1]*After invasion, ubiquitin is conjugated to host cellular proteins in endosomes that contain Salmonella or transfection reagent–coated latex (polystyrene) beads, which mimic invading bacteria.*

[2] *Ubiquitin is recognized by the autophagic machinery independently of the LC3–ubiquitin interaction through adaptor proteins, including a direct interaction between ubiquitin and Atg16L1.*

(Fujita et al., 2013)

6.2) M5S2: Were the commonest name and common synonyms given?

M5S2 did not occur in the abstracts.

6.3) M5S3: Was a description given?

M5S3 did not occur in the abstracts.

6.4) M5S4: Was the duration indicated?

M5S4 did not occur in the abstracts.

7) Move 6: Measurement

Move 6 comprised four sub-moves concerning measurement. The details of each sub-move are shown in Table 4.3.6.

Table 4.3.6 Move6: Measurement

Move 6 is measurement, four questions are asked:	Code
1 was any information on the measures given?	M6S1
2 were the variables explicitly defined?	M6S2
3 was the source of the data given?	M6S3
4 if the measurements were subjective were the observers blinded to the patient groupings?	M6S4

7.1) M6S1: Was any information on the measures given?

M6S1 did not occur in the abstracts.

7.2) M6S2: Were the variables explicitly defined?

M6S2 did not occur in the abstracts.

7.3) M6S3: Was the source of the data given?

M6S3 did not occur in the abstracts.

7.4) M6S4: If the measurements were subjective were the observers blinded to the patient groupings?

M6S4 did not occur in the abstracts.

8) Move 7: Results

Move 7 comprised four sub-moves concerning results. The details of each sub-move are shown in Table 4.3.7.

Table 4.3.7 Move7: Results

Move 7 is result, which inquired to check:	Code
1 were any results given?	M7S1
2 were they directly related to the purpose?	M7S2
3 were appropriate numeric data given?	M7S3
4 were appropriate statistical values given?	M7S4

8.1) M7S1: Were any results given?

There were 135 sentences of M7S1 (results), which occurred 47 times, or 94% of all abstracts. The examples are as follows:

[JCB abstract/15]

[1]*We show that nonmuscle MIIB (myosin-IIB) is unpolarized in cells on soft matrix in 2D and also within soft 3D collagen, with rearward polarization of MIIB emerging only as cells migrate from soft to stiff matrix.* [*JCB* abstract 18]

[2]*However, MIIA has a key upstream role: in cells on soft matrix, MIIA appeared diffuse and mobile, whereas on stiff matrix, MIIA was strongly assembled in oriented stress fibers that MIIB then polarized.*

(Raab et al., 2012)

[JCB abstract/22]

Most surprisingly, our data show that dynactin is not required for dyneindependent spindle organization, but acts as a dynein recruitment factor.

(Raaijmakers, Tanenbaum, & Medema, 2013)

[JCB abstract/28]

[1]*We find that synaptic N-methyl-daspartate (NMDA) receptor stimulation in neurons leads to activation of PP1 through a mechanism involving inhibitory phosphorylation at Thr320 by Cdk5.*

[2]*Synaptic stimulation led to proteasome-dependent degradation of the Cdk5 regulator p35, inactivation of Cdk5, and increased auto-dephosphorylation of Thr320 of PP1.*

[3]*We also found that neither inhibitor-1 nor calcineurin were involved in the control of PP1 activity in response to synaptic NMDA receptor stimulation.*

[4]*Rather, the PP1 regulatory protein, inhibitor-2, formed a complex with PP1 that was controlled by synaptic stimulation.*

(Hou et al., 2013)

8.2) M7S2: Were they directly related to the purpose?

There were seven sentences of M7S2 (results), and it occurred twice, or 4% of all abstracts. The examples are as follows:

[JCB abstract/4]

[1]*We demonstrate that Hectd1 is a functional ubiquitin ligase and that one of its substrates is Hsp90, a chaperone protein with both intra- and extracellular clients.*

[2]*Extracellular Hsp90 enhances migration of multiple cell types.*

[3]*In mutant cranial mesenchyme cells, both secretion of Hsp90 and emigration of cells from cranial mesenchyme explants were enhanced.*

[4]*Importantly, we show that this enhanced emigration was highly dependent on the excess Hsp90 secreted from mutant cells.*

(Sarkar, & Zohn, 2012)

[JCB abstract/50]

[1]*The 2.5- Å resolution IFT70/52 structure shows that IFT52330–370 is buried deeply within the IFT70 tetratricopeptide repeat superhelix.*

[2]*The structure of IFT52C/IFT46C was solved at 2.3 Å resolution, and we show that it is essential for IFT-B core integrity by mediating interaction between IFT88/70/52/46 and IFT81/74/27/25/22 subcomplexes.*

[3]*Consistent with this, overexpression of mammalian IFT52C in MDCK cells is dominant-negative and causes IFT protein mislocalization and disrupted ciliogenesis.*

(Taschner, Kotsis, Braeuer, Kuehn, & Lorentzen, 2014)

8.3) M7S3: Were appropriate numeric data given?

M7S3 did not occur in the abstracts.

8.4) M7S4: Were appropriate statistical values given?

M7S4 did not occur in the abstracts.

9) Move 8: Conclusion

Move 8 comprised six sub-moves concerning conclusion. The details of each sub-move are shown in Table 4.3.8.

Table 4.3.8 Move 8: Conclusion

Move 8 is conclusion, six questions are asked:	Code
1 were any conclusions drawn?	M8S1
2 were they directly related to the purpose?	M8S2
3 were they consistent with the results?	M8S3
4 were the study's limitations mentioned?	M8S4
5 were the study's implications mentioned?	M8S5
6 were there recommendations for further study?	M8S6

9.1) M8S1: Were any conclusion drown?

There were 46 sentences of M8S1 (conclusion), which occurred 37 times, or 74% of all abstracts. The examples are as follows:

[JCB abstract/3]

These observations are consistent with the idea that motions facilitate pairing by enhancing the search rate but that their primary function is to trigger synapsis.

(Wynne, Rog, Carlton, & Dernburg, 2012)

[JCB abstract/15]

Polarization is thus shown to be a highly regulated compass for mechanosensitive migration.

(Raab et al., 2012)

[JCB abstract/29]

Thus, we reveal that ubiquitin is a pivotal molecule that connects bacteria containing endosomes with the autophagic machinery upstream of LC3.

(Fujita et al., 2013)

9.2) M8S2: Were they directly related to the purpose?

There were two sentences of M8S2 (conclusion), which occurred once, or 2% of all abstracts. The examples are as follows:

[JCB abstract/17]

[1]*Our data indicated that, upon MARK4 or ODF2 knockdown, the ciliary program arrested before the complete removal of the CP110–Cep97 inhibitory complex from the mother centriole, suggesting that these proteins act at this level of axonemal extension.*

[2]*We propose that MARK4 is a critical positive regulator of early steps in ciliogenesis.*

(Kuhns, 2013)

9.3) M8S3: Were they consistent with the results?

There was only one sentence of M8S3 (conclusion), which occurred once, or 2% of all abstracts. The example is given below.

[JCB abstract/17]

Our work fills a major gap regarding the regulation of PP1 in synaptic plasticity.

(Kuhns, 2013)

9.4) M8S4: Were the study's limitations mentioned?

M8S4 did not occur in the abstracts.

9.5) M8S5: Were the study's implications mentioned?

There were 18 sentences of M8S5 (conclusion), which occurred 18 times, or 36% of all abstracts. The examples are as follows:

[JCB abstract/8]

These data suggest that the trichoplein–AurA pathway is required for G1 progression through a key role in the continuous suppression of primary cilia assembly.

(Inoko et al., 2012)

[JCB abstract/12]

They further suggest a novel multivalent mechanism for SUMO-mediated recruitment of transcriptional coregulatory factors.

(Lee et al., 2012)

[JCB abstract/27]

We show that the nucleo-cytoplasmic regulation of Gwl is essential for its functions in vivo and propose that the spatial regulation of Gwl at mitotic entry contributes to the mitotic switch.

(Wang et al., 2013)

9.6) M8S6: Were the recommendations for further study?

M8S6 did not occur in the abstracts.

The above examples show the moves and sub-moves found in the *JCB* corpus. However, the set of nine moves was not always used in the abstracts. Move B *(background),* Move 8 *(conclusion),* and Move 7 *(results)* were found to be more frequent than the others.

4.2.2 The Sequence of Moves in Abstracts of *JCB* Research Articles

The patterns of move sequence are diverse in the *JCB* abstracts. There were six patterns of move sequence consisting of seven moves: "background" (MB), "purpose" (M1), "research design" (M2), "subjects" (M4), "intervention" (M5), "results" (M7) and "conclusion" (M8). In the abstracts, each move can occur more than one time, and one sentence can include more than one move. The patterns of move sequence of abstracts in cell biology research articles are shown in Table 4.4.

Table 4.4 Move Sequence of Abstracts in JCB Research Articles

Pattern of move sequence	*f* (n = 50)	%
Pattern 1 MB-M1 other moves M7 and M8	**26**	**52**
MB-M1-M7-M8	10	20
MB-M1/7-M7-M8	6	12
MB-M1/4-M7-M8	1	2
MB-M1/2-M7-M8	1	2
MB-M1/5-M7-M8	1	2
MB-M1-M5-M2-M8	1	2
MB-M1-M7-M2/1/8	1	2
MB-M1-M4-M7-M8	1	2
MB-M1/7/4-M7-M8	1	2
MB-M1/2-M7-M7/8-M8	1	2
MB-M1/7-M7-M2/7-M8	1	2
MB-M1/7-M7-M2/7-M7-M8	1	2
Pattern 2 MB-M7 other moves and M8	**15**	**30**
MB-M7-M8	5	10
MB-M7-M8-M7-M8	2	4
MB-M7	1	2
MB-M7-M7/8	1	2
MB-M7-M8-M1	1	2
MB-M7-M1/7-M8	1	2
MB-M7/4-M7-M8	1	2
MB-M7-M7/8-M8	1	2
MB-M7-M1-M7-M8	1	2
MB-M7-NM/7-M7-M8	1	2
Pattern 3 MB-M2 other moves M7 and M8	**5**	**10**
MB-M2/7-M7-M8	2	4
MB-M2-M7-M8	1	2
MB-M2/4/7-M7-M8	1	2
MB-M2-M2/7-M7-M8	1	2
Pattern 4 MB-M4 other moves M7 and M8	**2**	**4**
MB-M4/1-M7-M8	1	2
MB-M4-M2/1-M7-M8	1	2
Pattern 5 MB-M5 other moves and M8	**1**	**2**
MB-M5-M1-M7-M2/7-M8	1	2
Pattern 6 M1-M7-M8	**1**	**2**
M1-M7-M8	1	2
Total	**50**	**100**

Note: M1/7 = Move 7 embeds in Move 1

From Table 4.4, it showed that the pattern 1 was the most found in the *JCB* abstracts, and occurred in 52% of all abstracts. The pattern 1-5 in *JCB* abstracts began with

MB concerning "background information", but the second move of each pattern was different. For instance, the second move of pattern 1 is "purpose" (M1). The second move of pattern 2 is "results" (M7). The second move of pattern 3 is "research design" (M2). The second move of pattern 4 is "subjects" (M4). The second move of pattern 5 is "intervention" (M5). However, the pattern 6 differed from pattern 1-5 because they began with "purpose" (M1). The examples of each pattern are given below.

Pattern 1: MB-M1 other moves M7 and M8

In pattern 1, there were 26 abstracts, which were 52% of all abstracts. The example is as follow:

[JCB abstract/3]

Background = S1-3

[1]Meiotic chromosome segregation requires homologue pairing, synapsis, and crossover recombination, which occur during meiotic prophase. [2]Telomere-led chromosome motion has been observed or inferred to occur during this stage in diverse species, but its mechanism and function remain enigmatic. [3]In Caenorhabditis elegans, special chromosome regions known as pairing centers (PCs), rather than telomeres, associate with the nuclear envelope (NE) and the microtubule cytoskeleton.

Purpose = S4

[4]In this paper, we investigate chromosome dynamics in living animals through high-resolution four-dimensional fluorescence imaging and quantitative motion analysis.

Results = S5-7

[5]We find that chromosome movement is constrained before meiosis. [6]Upon prophase onset, constraints are relaxed, and PCs initiate saltatory, processive, dynein-dependent motions along the NE. [7]These dramatic motions are dispensable for homologous pairing and continue until synapsis is completed.

Conclusion = S8-9

[8]These observations are consistent with the idea that motions facilitate pairing by enhancing the search rate but that their primary function is to trigger synapsis. [9]This quantitative analysis of chromosome dynamics in a living animal extends our understanding of the mechanisms governing faithful genome inheritance.

(Wynne, Rog, Carlton, & Dernburg, 2012)

Pattern 2: MB-M7 other moves and M8

In pattern 2, there were 15 abstracts, which were 30% of all abstracts. The example is as follow:

[JCB abstract/14]

Background = S1-2

Results = S3-6

Conclusion = S7

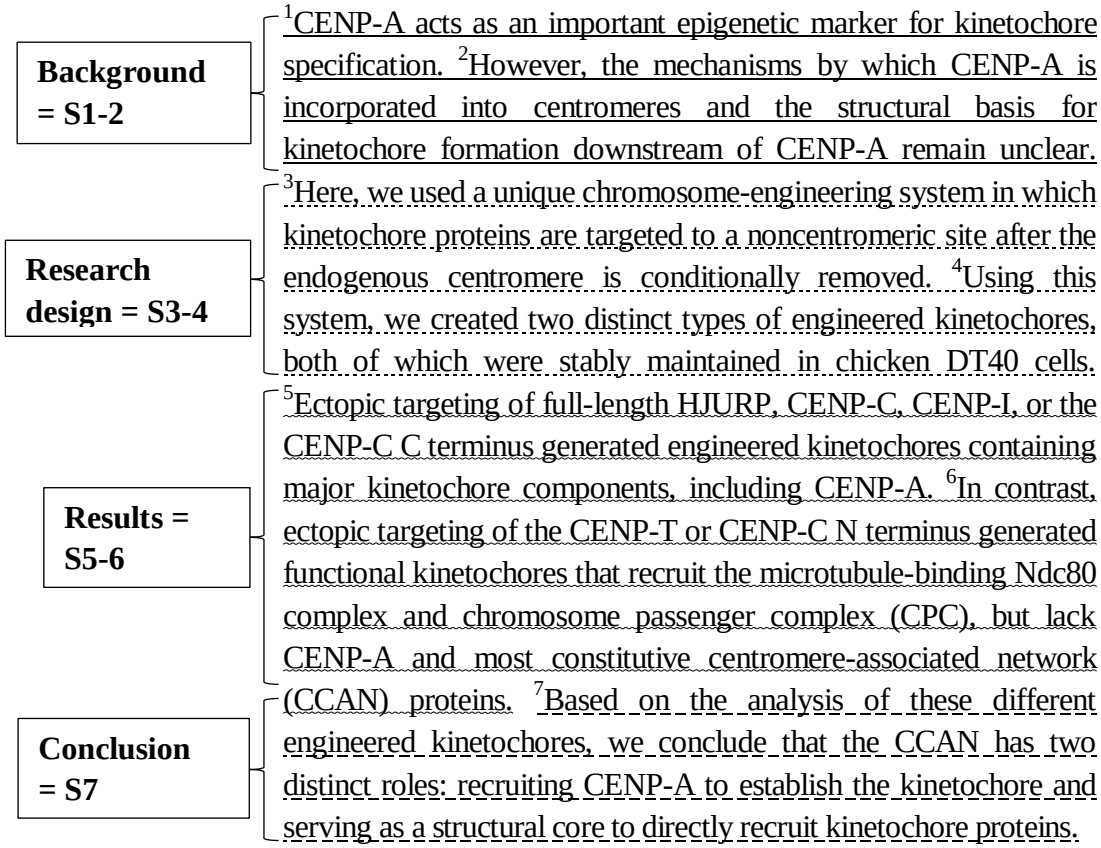
[1]The function of the essential checkpoint kinases Bub1 and BubR1 requires their recruitment to mitotic kinetochores. [2]Kinetochore recruitment of Bub1 and BubR1 is proposed to rely on the interaction of the tetra-tricopeptide repeats (TPRs) of Bub1 and BubR1 with two KI motifs in the outer kinetochore protein Knl1. [3]We determined the crystal structure of the Bub1 TPRs in complex with the cognate Knl1 KI motif and compared it with the structure of the equivalent BubR1TPR–KI motif complex. [4]The interaction developed along the convex surface of the TPR assembly. [5]Point mutations on this surface impaired the interaction of Bub1 and BubR1 with Knl1 in vitro and in vivo but did not cause significant displacement of Bub1 and BubR1 from kinetochores. [6]Conversely, a 62-residue segment of Bub1 that includes a binding domain for the checkpoint protein Bub3 and is C terminal to the TPRs was necessary and largely sufficient for kinetochore recruitment of Bub1. [7]These results shed light on the determinants of kinetochore recruitment of Bub1.

(Krenn, Wehenkel, Li, Santaguida, & Musacchio, 2012)

Pattern 3: MB-M2 other moves M7 and M8

In pattern 3, there were five abstracts, which were 10% of all abstracts. The example is as follow:

[JCB abstract/18]

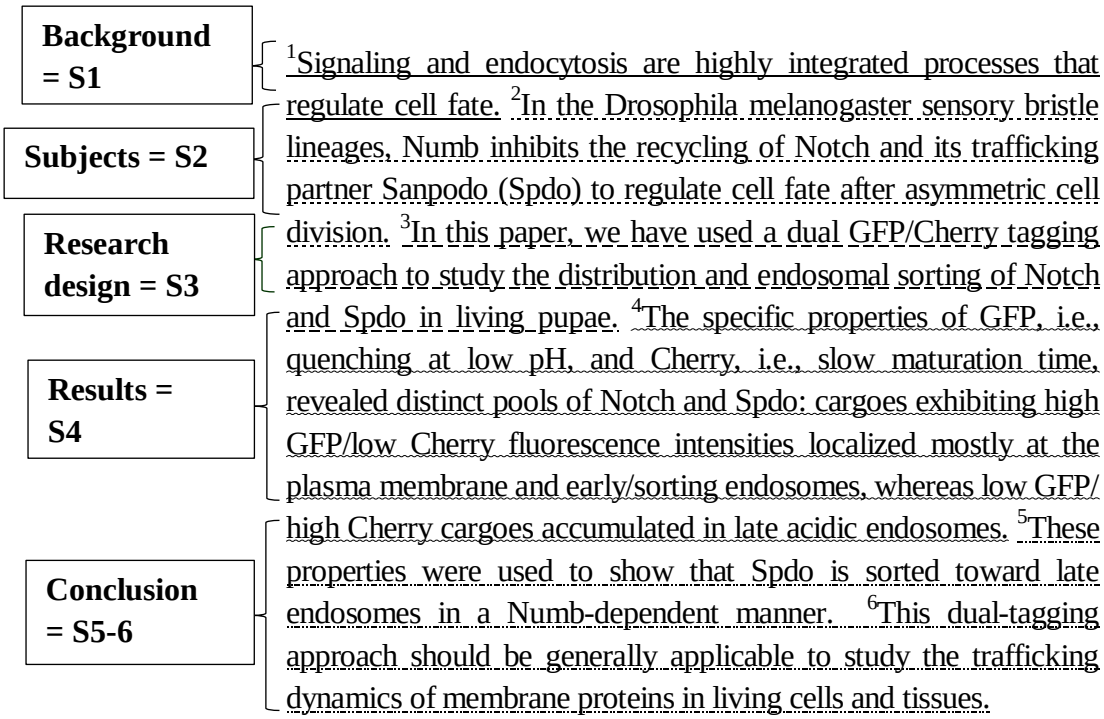


(Hori, Shang, Takeuchi, & Fukagawa, 2012)

Pattern 4: MB-M4 other moves M7 and M8

In pattern 4, there were two abstracts, which were 4% of all abstracts. The example is as follow:

[JCB abstract/48]

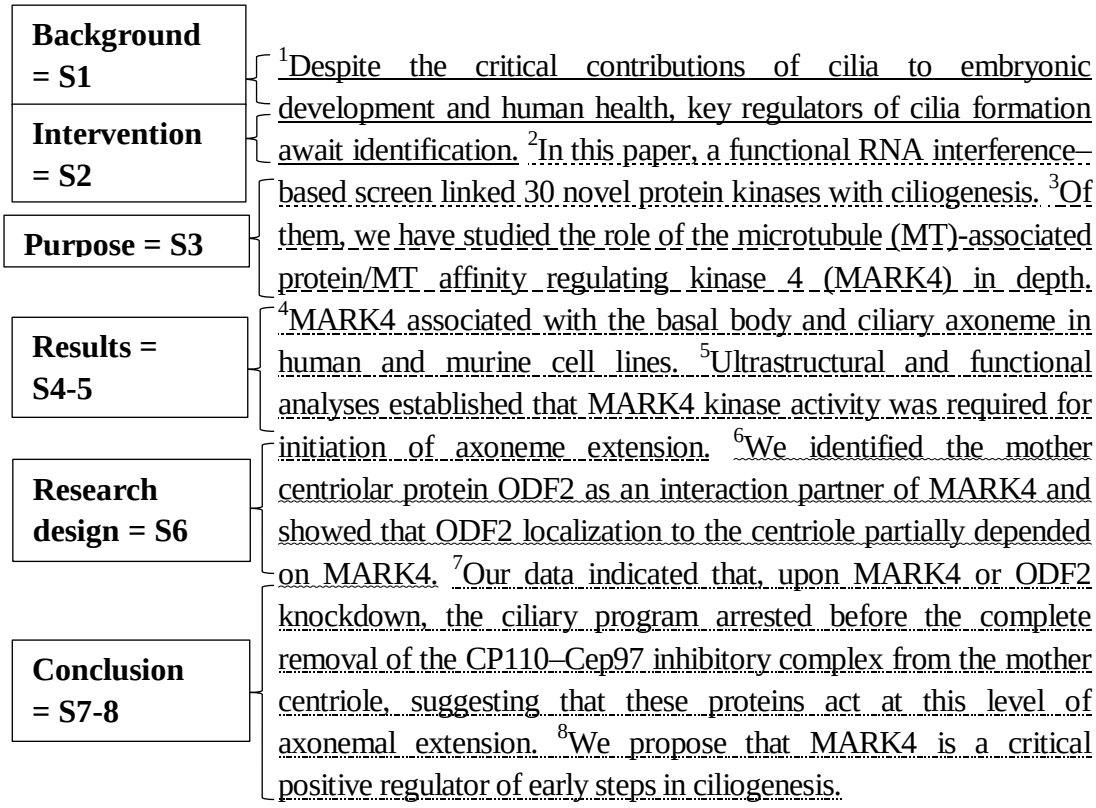


(Couturier, Trylinski, Mazouni, Darnet, & Schweisguth, 2014)

Pattern 5: MB-M5 other moves and M8

In pattern 5, there was one abstract, which was 2% of all abstracts. The example is as follow:

[JCB abstract/17]

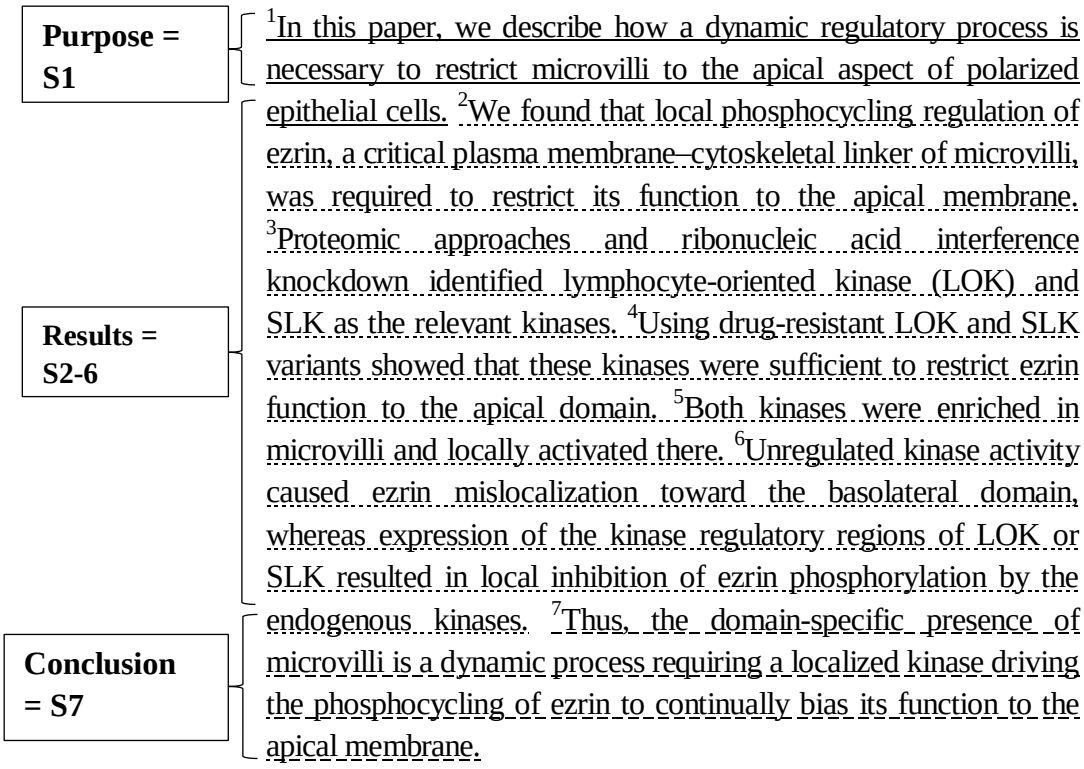


(Kuhns et al., 2013)

Pattern 6: M1-M7 and other moves

In pattern 6, there was one abstract, which was 2% of all abstracts. The example is as follow:

[JCB abstract/14]



(Viswanatha, Ohouo, Smolka, & Bretscher, (2012)

In brief, the abstracts of cell biology research articles consisted of seven moves: *background, purpose, research design, subjects, intervention, results,* and *conclusion*. The first move was a new move (background) which was found the most in this corpus, and the six moves followed the framework of Taddio et al., (1994). Move 3 *(setting)* and move 6 *(measurement)* did not appear in the JCB corpus. Based on their occurrences, moves B (*background*), move 8 (*conclusion*), move 7 (*results*), and move 1 (*purpose*) play an integral role in the abstracts. In contrast, move 2 (*research designs*), move 4 (*subjects*), and move 5 (*intervention*) were the least frequent. In addition, the JCB corpus found ten patterns of move sequence which consisted of nine moves, and 98% of abstracts began with move *background.* However, each abstract contained different moves, and the move sequences

were diverse. Subsequently, the pattern of the moves in the abstracts of *JCB* research articles comprised seven moves which were differently sequenced in each abstract.

4.3 Research question 3: What were the similarities and differences of the frequency and the sequence of moves in the abstracts between laboratory animal review articles and cell biology research articles?

This study aimed to explore the similarities and differences of frequency and sequence of moves in the abstracts between laboratory animal review articles and cell biology research articles. The were divided into two corpora: ILAR corpus and JCB corpus. Each corpus comprised of 50 abstracts of articles. From data analysis, the results showed that the moves of both ILAR corpus and JCB corpus were dissimilar to the framework of Taddio et al. (1994). Therefore, the results are shown in two sections of similarities and differences as the frequency of moves and the sequence of moves.

4.3.1 The Differerence of Move Frequency

According to the categorization of the move, the results found that the number of moves and sub-moves occurring among two corpora were different. The results are shown in Table 4.5.

Table 4.5 Frequency of Move and Sub-Move Occurrences in *ILAR* Review Article Abstracts and *JCB* Research Article Abstracts

Moves and sub-moves	*ILAR* review article abstracts		*JCB* research article abstracts	
	f	%	*f*	%
Move B: new move				
MB: is about background information.	47	94	49	98
Move 1 is about purpose, and asks:				
M1S1: was any information on the purpose given?	34	68	27	54
M1S2: was the purpose explicitly stated?	8	16	4	8
M1S3: was the main purpose distinguished from secondary ones?	2	4	0	0
Move 2 is limited to research design, examined with these questions:				
M2S1: was any information on the research design given?	1	2	4	8
M2S2: were technical descriptors used?	2	4	8	16
M2S3: if a follow-up study, was the duration given?	0	0	0	0
Move 3 is setting, and described with these questions:				
M3S1: was any information on the setting given?	2	4	0	0
M3S2: was the level of clinical care (e.g. primary care) indicated?	0	0	0	0
Move 4 is subjects, the following questions are asked:				
M4S1: was any information on the subjects given?	5	10	2	4
M4S2: were common demographic characteristics given?	0	0	0	0
M4S3: were technical descriptors of subject selection (e.g., random sample) used?	0	0	1	2
M4S4: was the number of subjects indicated?	1	2	0	0
M4S5: were the response and refusal rates indicated?	0	0	0	0
M4S6: was the number of dropouts and losses indicated?	0	0	0	0
M4S7: if the samples were matched were matching characteristics given?	0	0	0	0
Move 5 is intervention, examined with these question:				
M5S1: was any information on intervention given?	6	12	3	6
M5S2: were the commonest name and common synonyms given?	1	2	0	0
M5S3: was a description given?	2	4	0	0
M5S4: was the duration indicated?	0	0	0	0
Move 6 is measurement, four questions are asked:				
M6S1: was any information on the measures given?	2	4	0	0
M6S2: were the variables explicitly defined?	1	2	0	0
M6S3: was the source of the data given?	0	0	0	0
M6S4: if the measurements were subjective were the observers blinded to the patient groupings?	0	0	0	0
Move 7 is result, which inquired to check:				
M7S1: were any results given?	7	14	47	94
M7S2: were they directly related to the purpose?	2	4	2	4
M7S3: were appropriate numeric data given?	1	2	0	0
M7S4: were appropriate statistical values given?	0	0	0	0
Move 8 is conclusion, six questions are asked:				
M8S1: were any conclusions drawn?	17	34	37	74
M8S2: were they directly related to the purpose?	0	0	1	2
M8S3: were they consistent with the results?	0	0	1	2
M8S4: were the study's limitations mentioned?	0	0	0	0
M8S5: were the study's implications mentioned?	16	32	18	36
M8S6: were there recommendations for further study?	8	16	0	0

From Table 4.5, nine moves were found in the abstracts consisting of *background, purpose, research design, setting, subjects, intervention, measurement, results,* and *conclusion.* Each move had different sub-moves that occurred in the corpus. For instance, move 1 found three sub-moves: M1S1: was any information on the purpose given?, M1S2: was the purpose explicitly stated?, and M1S3: was the main purpose distinguished from secondary ones? Move 2 found two sub-moves: M2S1: was any information on the research design given?, and M2S2: were technical descriptors used? Move 3 found one sub-move: M3S1: was any information on the setting given? Move 4 found three sub-moves: M4S1: was any information on the subjects given?, M4S3: were technical descriptors of subject selection (e.g., random sample) used?, and M4S4: was the number of subjects indicated? Move 5 found three sub-moves: M5S1: was any information on intervention given?, M5S2: were the commonest name and common synonyms given?, and M5S3: was a description given? Move 6 found two sub-moves: M6S1: was any information on the measures given?, and M6S2: were the variables explicitly defined? Move 7 found three sub-moves: M7S1: were any results given?, M7S2: were they directly related to the purpose?, M7S3: were appropriate numeric data given? Lastly, move 8 found five sub-moves: M8S1: were any conclusions drawn?, M8S2: were they directly related to the purpose?, M8S3: were they consistent with the results?, M8S5: were the study's implications mentioned?, and M8S6: were there recommendations for further study?

When each move occurrence between *ILAR* review article abstracts and *JCB* research article abstracts was compared, the results are shown in Figure 4.2.

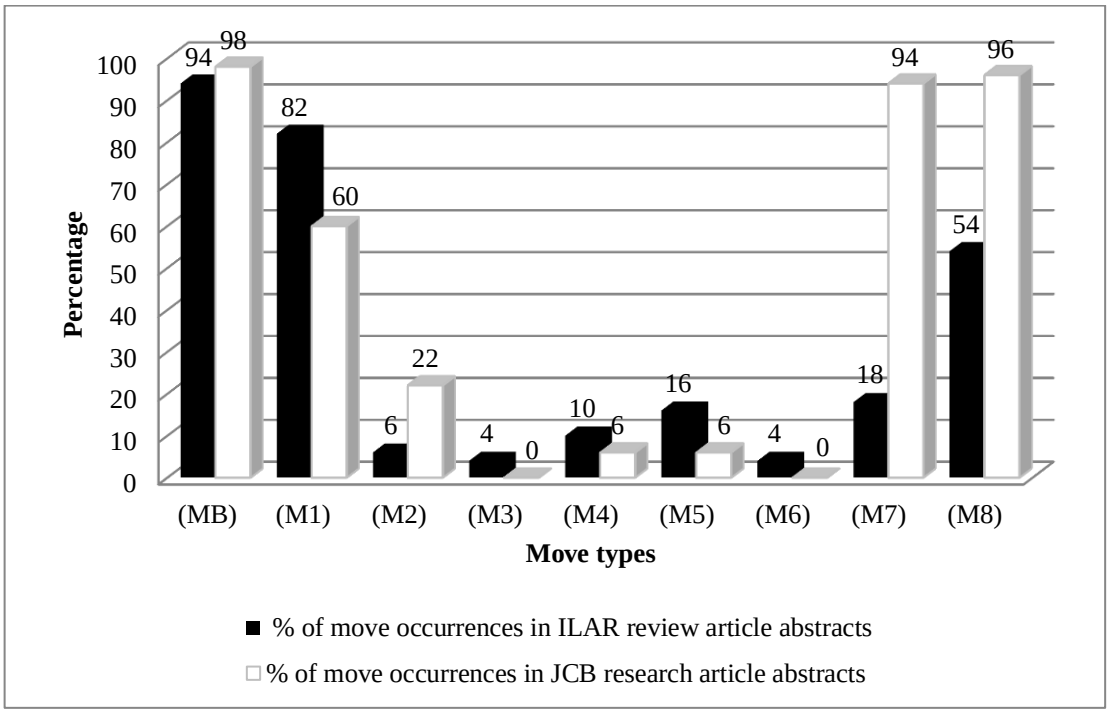


Figure 4.2 Comparison of Move Occurrence between ILAR Corpus and JCB Corpus

From Figure 4.2, the amount of move occurrences between ILAR corpus and JCB corpus was different. In ILAR corpus, the abstracts found nine moves: *background, purpose, research design, setting, subjects, intervention, measurement, result,* and *conclusion.* In contrast, there were seven moves found in JCB corpus consisting of *background, purpose, research design, subjects, intervention, result,* and *conclusion.* However, the move occurrences in *ILAR* corpus were dissimilar to those in *JCB* corpus. The results are presented into two sections, below, as high frequency of moves and low frequency of moves.

1) The High Frequency of Moves

ILAR corpus and *JCB* corpus found the move of background (MB) that occurred very frequently in the abstracts. However, two corpora had the different top three of high frequency of moves. In *ILAR* corpus, the top three moves of high frequency were MB (*background*), M1 (*purpose*), and M8 (*conclusion*). In contrast, the top three moves of high frequency in *JCB* corpus were MB (*background*), M8 (*conclusion*), and M7 (*results*). Interestingly, the move B of both corpora was the highest in each corpus. The move B in *ILAR* corpus occurred 94%, which was less than in *JCB* corpus about 4%. Therefore, four moves that were found frequently were the crucial moves of abstracts.

2) The Low Frequency of Moves

M3 (*setting*) and M6 (*measurement*) were found at least of all moves. In *ILAR* corpus, M3 (*setting*) and M6 (*measurement*) occurred the least i.e. twice (4%). In contrast, M3 (*setting*) and M6 (*measurement*) did not appear in the *JCB* corpus. Thus, the least frequency of moves occurred in abstracts were M3 (*setting*) and M6 (*measurement*).

In short, in terms of the frequency of moves, *ILAR* corpus was similar to *JCB* corpus. MB (move background) occurred the most frequently in the abstracts. M3 (move setting) and M6 (move measurement) were rarely found in the abstracts of both journals.

4.3.2 The Differerence of Move Sequence

In this study, there were two corpora: *ILAR* review article abstracts and *JCB* research article abstracts that the move sequences were different. In *ILAR* corpus, ten patterns of move sequence were found, but there were six patterns of move sequence in *JCB* corpus. The details of move sequences are presented in Table 4.6.

Table 4.6 Comparison of Move Sequences between ILAR Corpus and JCB Corpus

Pattern	ILAR corpus	*f*	%	JCB corpus	*f*	%
1	MB-M1 other moves and M8	**27**	**54**	MB-M1 other moves M7 and M8	**26**	**52**
	MB-M1	12	24	MB-M1-M7-M8	10	20
	MB-M1-M8	3	6	MB-M1/7-M7-M8	6	12
	MB-M1-M7-M8	2	4	MB-M1/4-M7-M8	1	2
	MB-M1/8	1	2	MB-M1/2-M7-M8	1	2
	MB-M1-MB	1	2	MB-M1/5-M7-M8	1	2
	MB-M1-M5	1	2	MB-M1-M5-M2-M8	1	2
	MB-M1/2-M8	1	2	MB-M1-M7-M2/1/8	1	2
	MB-M1-M8-M1	1	2	MB-M1-M4-M7-M8	1	2
	MB-M1-MB-M8	1	2	MB-M1/7/4-M7-M8	1	2
	MB-M1-MB-M7-M8	1	2	MB-M1/2-M7-M7/8-M8	1	2
	MB-M1/2-M6-M7-M8	1	2	MB-M1/7-M7-M2/7-M8	1	2
	MB-M1-MB-M7-M8	1	2	MB-M1/7-M7-M2/7-M7-M8	1	2
	MB-M1-M5-M7-M1-M8	1	2			
2	MB-M8 and other moves	**7**	**14**	MB-M7 other moves and M8	**15**	**30**
	MB-M8	5	10	MB-M7-M8	5	10
	MB-M8-M1	1	2	MB-M7-M8-M7-M8	2	4
	MB-M8-M7-M8	1	2	MB-M7	1	2
				MB-M7-M7/8	1	2
				MB-M7-M8-M1	1	2
				MB-M7-M1/7-M8	1	2
				MB-M7/4-M7-M8	1	2
				MB-M7-M7/8-M8	1	2
				MB-M7-M1-M7-M8	1	2
				MB-M7-MB/7-M7-M8	1	2
3	MB-M5 and other moves	**4**	**8**	MB-M2 other moves M7 and M8	**5**	**10**
	MB-M5-M1	1	2	MB-M2/7-M7-M8	2	4
	MB-M5-MB-M8	1	2	MB-M2-M7-M8	1	2
	MB-M5-M2/8-M8	1	2	MB-M2/4/7-M7-M8	1	2
	MB-M5-MB/5-M1-M8	1	2	MB-M2-M2/7-M7-M8	1	2
4	MB-M4 and other moves	**3**	**6**	MB-M4 other moves M7 and M8	**2**	**4**
	MB-M4-M1	1	2	MB-M4/1-M7-M8	1	2
	MB-M4/MB-M1	1	2	MB-M4-M2/1-M7-M8	1	2
	MB-M4-M1-M1/8	1	2			
5	MB-M3 and other moves	**2**	**4**	MB-M5 and other moves	**1**	**2**
	MB-M3-MB-M1	1	2	MB-M5-M1-M7-M2/7-M8	1	2
	MB-M3-MB/4-M1	1	2			
6	MB-M2 and other moves	**2**	**4**	M1-M7-M8	1	2
	MB-M2-M8-M1	1	2			
	MB-M2-M4/2-M5-M6-M5-M7-M8	1	2			
7	MB-M7 and other moves	**1**	**2**			
	MB-M7-M1/7-M1/8-MB/1/8	1	2			
8	M1-M8	2	4			
9	M1-MB-M8	1	2			
10	M1-M4-M8	1	2			
Total		**50**	**100**		**50**	**100**

From Table 4.6, the move sequence in the *ILAR* corpus had a pattern similar to the move sequence in the *JCB* corpus. The pattern of move sequence found the most in the abstracts of both corpora was pattern 1 (MB-M1 other move and M8). Pattern 1 was found the most in the abstracts of both corpora; however, the pattern 1 of JCB corpus includes M7. Pattern 1 in *ILAR* corpus consisted of 27 review article abstracts, while *JCB* corpus comprised 26 research article abstracts. Therefore, the sequence from MB (background) to M1 (purpose), or pattern 1 was noticeable in the abstracts. To see more details of pattern 1, the sequences of moves in this pattern are shown in Table 4.7.

Table 4.7 Patterns of High Move Sequences in *ILAR* Review Articles and *JCB* Research Articles

ILAR corpus			**JCB corpus**		
Pattern 1 MB-M1 other moves and M8	***f***	**%**	**Pattern 1 MB-M1 other moves M7 and M8**	***f***	**%**
MB-M1	12	24	MB-M1-M7-M8	10	20
MB-M1-M8	3	6	MB-M1/7-M7-M8	6	12
MB-M1-M7-M8	2	4	MB-M1/4-M7-M8	1	2
MB-M1/8	1	2	MB-M1/2-M7-M8	1	2
MB-M1-MB	1	2	MB-M1/5-M7-M8	1	2
MB-M1-M5	1	2	MB-M1-M5-M2-M8	1	2
MB-M1/2-M8	1	2	MB-M1-M7-M2/1/8	1	2
MB-M1-M8-M1	1	2	MB-M1-M4-M7-M8	1	2
MB-M1-MB-M8	1	2	MB-M1/7/4-M7-M8	1	2
MB-M1-MB-M7-M8	1	2	MB-M1/2-M7-M7/8-M8	1	2
MB-M1/2-M6-M7-M8	1	2	MB-M1/7-M7-M2/7-M8	1	2
MB-M1-MB-M7-M8	1	2	MB-M1/7-M7-M2/7-M7-M8	1	2
MB-M1-M5-M7-M1-M8	1	2			
Total	**27**	**54**	**Total**	**26**	**52**

From Table 4.7, the sequences of moves have three main moves: MB (background), M1 (purpose) and M8 (conclusion). Each sequence consisted of different moves. The pattern of MB-M1 with other moves in *ILAR* corpus occurred 54%, which was more than in *JCB* corpus by about 2%. Therefore, this pattern found frequently was the crucial pattern of abstracts. Abstracts of two corpora ended the sequences with M8 (*conclusion*). However, each abstract had the difference of move sequences as a result of move occurrences.

In short, the *ILAR* corpus and *JCB* corpus contained diverse patterns of move sequences. *ILAR* corpus found ten patterns of move sequences, which were more than in *JCB* corpus by two patterns. In addition, the pattern 1 (*MB-M1 and other moves*) was found the most frequently in the abstracts of two corpora. MB (background) was in the first position of move sequence in the abstracts, M1 (purpose) was in the second position of move sequence in the abstracts, and M8 was in the last position of move sequence.

4.4 Research Question 4: What were the language uses of the highest-frequency move found in the abstracts of laboratory animal review articles and cell biology research articles in terms of verb choices, tenses, voices, and types of sentence?

According to the findings of move frequency of both corpora, the move background (MB) was found the most in the abstracts of laboratory animal review articles and cell biology research articles. Thus, move background is the highest-frequency move which explored the language uses in terms of verb choices, tense, voices, and types of sentences. In addition, to ensure that the move background is the highest-frequency move, the researcher analyzed the amount of words and sentences in the abstracts and moves background from the all abstracts of pattern1. This is because the move sequence (Pattern1: MB-M1 other moves and M8) was found to occur the most in both corpora. The results found that both corpora found the same moves with high-frequency which is move background (MB). The details of words and sentences in abstracts and move background are shown as Table 4.8.

Table 4.8 Number of Words and Sentences in Abstracts, Move Background occurred in Pattern 1 of ILAR Corpus and JCB Corpus

	ILAR				JCB			
	Abstracts		MB		Abstracts		MB	
	n	*M*	*n*	*M*	*n*	*M*	*n*	*M*
Words	4363	161.6	2481	91.9	4093	157.4	994	38.2
Sentences	169	6.3	108	4	188	7.2	51	2

* MB = move background

From Table 4.8, in the ILAR corpus, the abstracts contained about 6-7 sentences, but the abstracts of JCB corpus included about 7-8 sentences. For move background, the abstracts of ILAR corpus comprised about 4 sentences, but the abstracts of JCB corpus included about 2 sentences. In addition, based on the move frequency, move background occurred 94% of move occurrences in abstracts of laboratory animal review articles, and the abstracts of cell biology research articles found 98% of move occurrences. These meant the background move is the highest-frequency of move which was found to occur the most in both corpora. The following section presents the frequency of language uses of move background in both corpora and examples of sentence.

4.4.1 The Frequency of Language Uses Found in Move Background of Abstracts in Laboratory Animal Review Articles and Cell Biology Research Articles in Terms of Verb Choices, Tenses, Voices, and Types of Sentence

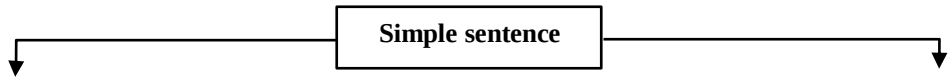
In both corpora, the most frequently used language forms in the move background were finite verb, present tense, active voice, and simple sentence. The details of language uses in move background are shown as Table 4.9.

Table 4.9 Language Uses in Move Background between ILAR Corpus and JCB Corpus

Language Uses	ILAR		JCB	
	f	%	*f*	%
Verb				
-Finite	100	92.59	49	96.1
-Modal	8	7.41	2	3.9
Tense				
-Past	3	2.78	0	0
-Present	105	97.22	51	100
-Future	0	0	0	0
Voice				
-Active	86	79.63	36	70.59
-Passive	22	20.37	15	29.41
Types of sentence				
-Simple	69	63.89	28	54.9
-Compound	10	9.26	7	13.7
-Complex	25	23.15	16	31.4
-Compound-Complex	4	3.70	0	0

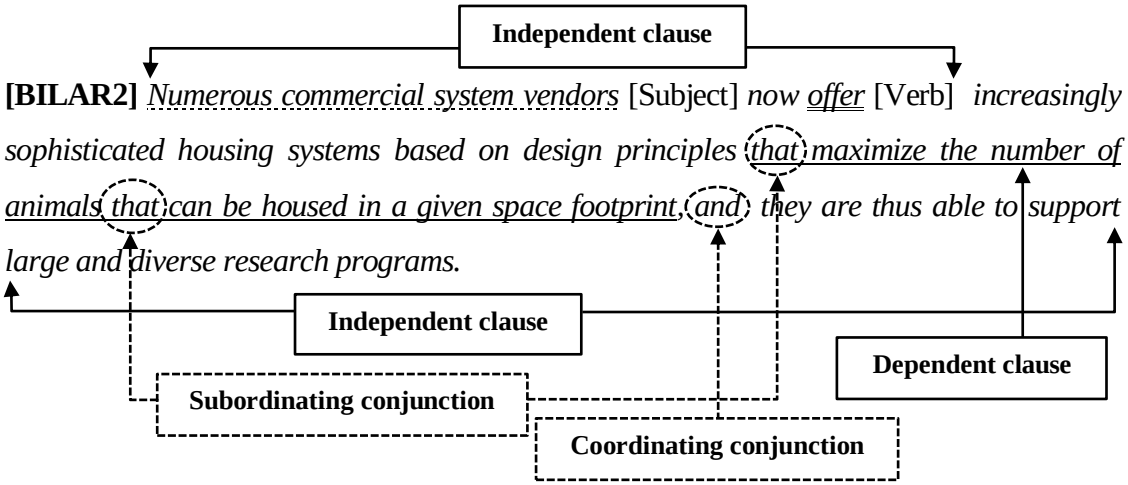
The sentence examples of move background in the abstracts of laboratory animal review articles and cell biology research articles are presented as follows:

Examples of Background Sentences in Abstracts of Laboratory Animal Review Articles (ILAR Corpus)



[BILAR1] *The strategies for housing* [Subject] *zebrafish used in biomedical research have evolved* [Verb] *considerably over the past three decades.*

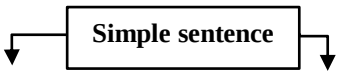
The sentence [BILAR1] used the finite verb *(have evolved)*, Present perfect tense *(has, have + V_3)*, Active voice, and the type of this sentence was Simple sentence *(Subject + Verb)*.



[BILAR2] *Numerous commercial system vendors* [Subject] *now offer* [Verb] *increasingly sophisticated housing systems based on design principles that maximize the number of animals that can be housed in a given space footprint, and they are thus able to support large and diverse research programs.*

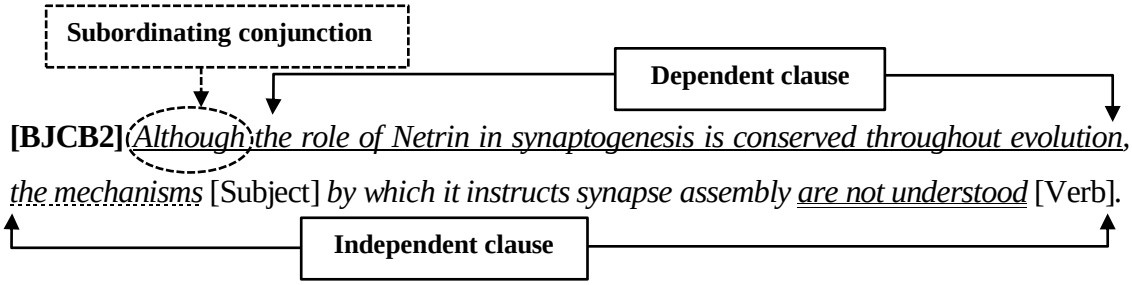
The sentence [BILAR2] used the finite verb *(offer)*, Present tense *(V_1)*, Active voice, and the type of this sentence was Compound-complex sentence because the sentence included two independent clauses and two dependent clauses.

Examples of Background Sentences in Abstracts of Cell Biology Research Articles (JCB Corpus)



[BJCB1] *Netrin* [Subject] *is* [Verb] *a chemotrophic factor known to regulate a number of neurodevelopmental processes, including cell migration, axon guidance, and synaptogenesis.*

The sentence [BJCB1] used the finite verb *(is)*, Present tense *(V_1)*, Active voice, and the type of this sentence was Simple sentence *(Subject + Verb)*.



[BJCB2] *Although the role of Netrin in synaptogenesis is conserved throughout evolution, the mechanisms* [Subject] *by which it instructs synapse assembly are not understood* [Verb].

The sentence [BJCB2] used the finite verb *(are not understood)*, Present tense *(V_1)*, Passive voice *($V_{to\ be} + V_3$)*, and the type of this sentence was Complex sentence because the sentence included one independent clause and one dependent clause.

In short, the move background in the abstracts of laboratory animal review articles and cell biology research articles used finite verb, present tense, active voice to write the sentences, and the sentences were in the form of simple sentences.

Chapter Summary

The findings of this chapter covers the frequency of moves, move sequences, and language uses of move background, which were found in the abstracts of laboratory animal review articles and cell biology research articles.

CHAPTER V
DISCUSSION

This chapter discusses the findings and implications of the study with respect to the purposes of the study. The results of the study are interpreted in terms of differences and similarities based on the research problems and previous studies. These discussions are designed into five parts as follows.

5.1 Discussion of Finding 1

5.2 Discussion of Finding 2

5.3 Discussion of Finding 3

5.4 Discussion of Finding 4

5.5 Implications of the Study

5.1 Discussion of Finding 1

Research Question 1: What were the frequency and the sequence of moves in the abstracts of laboratory animal review articles from ILAR?

In this section, the discussion consists of two parts according to the findings of the research: frequency of moves and move sequences in the abstracts of laboratory animal review articles (ILAR corpus).

5.1.1 Frequency of Moves of ILAR Corpus

In terms of move frequency found in the ILAR corpus, the findings are discussed in three aspects: new move (move background), conventional moves, and optional moves.

a) New move (Move Background) of ILAR Corpus

Move background is a new move found in the abstracts of laboratory animal review articles. This move is consistent with the studies of Santos (1996), Cross and Oppenhiem (2006), Pho (2008), Oneplee and Soranastaporn (2008), Kafes

(2012), and Kanoksilapatham (2013). All of them proposed the first move related to the background of the study, introduction, and situating the research. Thus, the move background is an essential move for abstracts in various fields including laboratory animal.

According to the findings, most abstracts included the move background with 94% of move occurrences in the entire corpus. In the abstracts of laboratory animal review articles, the move background provides the background information of the study such as importance of the study, source of the study, scope of the study, as well as the current knowledge, regulations, and situations involving laboratory animals. Thus, the abstracts of laboratory animal review articles include the move background in order to provide the background information of the study for readers.

The move background differed from the framework of Taddio et al. (1994) who proposed only eight moves without move background. Perhaps, his model could not be used to analyze the abstracts of other fields of research. Therefore, the researcher needs to offer the move background to be in Taddio et al. (1994)' move pattern [meaning not clear; please recast this sentence] in order to analyze the abstracts effectively.

Therefore, the move background is essential for the abstracts of laboratory animal review articles, which the authors should focus when they write the abstracts of review articles. For effective data analysis, the framework used for abstract analysis should include the move background.

b) Conventional Moves of ILAR Corpus

According to the findings, some moves occurred frequently in the abstracts of laboratory animal review articles. In terms of frequency of move occurrences, there are six studies which classified the moves in the corpus (e.g. Santos, 1996; Samraj, 2005; Cross & Oppenheim, 2006; Kanoksilapatham, 2007; Pho, 2008; Kafes, 2012; Kanoksilapatham, 2013). No previous study proposed criteria to classify the frequency of moves in the abstracts. However, Kanoksilapatham (2007) proposed that any moves occurred in the corpus at least 60% of the conventional moves. Therefore, based on the cut-off point (at least 60%), the abstracts of laboratory animal review articles include two conventional moves: move background (94% of move occurrences) and move purpose (82% of move occurrences).

Conventional Move 1: Move Background (ILAR Corpus): The move background occurred the most in the corpus [meaning not clear; please recast this sentence] is the main conventional move in abstracts of review articles in laboratory animal field. The guidelines of APA style suggested that the organization of review articles mainly includes introduction and background (American Psychological Association, 2010). To compare with previous studies, this corpus found the move background the most, while most studies found very few occurrences of the move background in the abstracts of research articles (e.g. Santos, 1996; Samraj, 2005; Cross & Oppenheim, 2006; Pho, 2008; Kafes, 2012). Thus, the move background is a crucial composition in abstracts of review articles.

Conventional Move 2: Move Purpose (ILAR Corpus): According to the move frequency, the move purpose also is the conventional move in the abstracts of laboratory animal review articles. This move is consistent with the studies of Samraj (2005), Prabripoo (2009), Kafes (2012), and Kanoksilapatham (2013), which found the move purpose in more than 60% of move occurrences in the abstracts. Thus, the move purpose is an important composition in abstracts of laboratory animal review articles, which the authors needed to provide the objectives of the study for the readers.

Therefore, the abstracts of laboratory animal review articles include two conventional moves which the author should focus on, and two moves in abstracts of review articles in laboratory animal field and other fields in science.

c) Optional Moves of ILAR Corpus

According to the findings, eight moves according to Taddio et al. (1994) occurred in the abstracts of laboratory animal review articles, but some moves were found slightly in the corpus such as research design (M2), setting (M3), subjects (M4), intervention (M5), measurement (M6), results (M7), and conclusion (M8). Based on the practice of Kanoksilapatham (2007), some moves that occurred less than 60% were classified as the optional moves. Thus, the abstracts of laboratory animal review articles were not focused in seven compositions because either they were the abstracts of review articles, or the authors aimed to summarize or critique issues from previous research.

The guidelines of APA style suggested that the review articles should include conclusion in the writing of review articles (American Psychological Association, 2010). Thus, the abstracts of laboratory animal review articles do not have the information to write of conclusion which sums up the issues or ideas from the study. Thus, the authors should summarize the ideas and information of study in abstract writing of review articles in order to help the reader know the overview of review.

Therefore, the abstracts of laboratory animal review articles include two main conventional moves: move background and move purpose. However, to be effective abstracts of review articles, the authors should provide the element [or section?] of conclusion at the end of abstracts in order to help the readers understand the main ideas of review in each article.

5.1.2 Move Sequences of ILAR Corpus

In terms of move sequences found in the ILAR corpus, the findings are discussed into two sections: the patterns of move sequences occurred in the ILAR Corpus and highest-frequency of move sequence occurred in the ILAR Corpus.

a) Patterns of Move Sequences Occurred in ILAR Corpus

The ILAR corpus found ten patterns of move sequences, which indicate that the organizations of abstracts in laboratory animal review articles have a variety of patterns. Likewise, Kanoksilapatham (2013) found that the moves in abstracts of civil engineering research articles can be organized into various patterns based on the authors' focuses. In this corpus, the pattern 1-7 began with move background as the first move, which was consistent with the studies of Santos (1996), Cross and Oppenhiem (2006), Pho (2008), Oneplee and Soranastaporn (2008), Kafes (2012) and Knoksilapatham (2013). Thus, the authors wanted to provide the background information first for the readers to know about the study.

Most patterns of move sequences in this corpus differed from the frameworks of Taddio et al. (1994) and Bhatia (1993) who proposed the move purpose as the first move. Obviously, the moves in the abstracts of laboratory animal review articles did not follow the framework of Taddio et al. (1994) because the moves of his model excluded the move background. Thus, the abstracts of laboratory animal review

articles can be analyzed based on the other frameworks (e.g. Swales, 1990, 2004; Santos, 1996).

b) Highest-Frequency of Move Sequence Occurred in ILAR Corpus

In the ILAR corpus, the pattern 1 (MB-M1 other moves and M8) occurred the most in the abstracts (54% of the entire corpus). Thus, this pattern is obligatory in the writing of abstracts in laboratory animal review articles. It includes three main moves: move background, move purpose, and move conclusion, and is organized by beginning with move background, followed by move purpose, other moves, and ending with move conclusion. This can be explained that the authors wanted to provide background information for the readers in order to help them know the scope of each review, present the objective of the study in order to provide what each study does, and summarize the overview of ideas of each study in order to help the readers understand the concept of the study.

Thus, the abstracts of laboratory animal review articles can be organized in various patterns based on the authors' objectives. However, to help the readers gain the information effectively, the authors should write the abstracts of review articles with three main compositions: background, purpose, and conclusion.

5.2 Discussion of Finding 2

Research Question 2: What were the frequency and the sequence of moves in the abstracts of cell biology research articles from JCB?

According to the findings, this section is designed to discuss the frequency of moves and move sequences found in the abstracts of cell biology research articles.

5.2.1 Frequency of Moves in JCB Corpus

In terms of frequency of moves, the discussion consisted of three points: new move (move background), conventional moves, and optional moves.

a) New move (Move Background) of JCB Corpus

The move background was found in the abstracts of cell biology research articles, which was not proposed in the framework of Taddio et al. (1994). However, this move is consistent with the studies of moves in abstracts of research articles

(Santos, 1996; Cross and Oppenhiem, 2006; Pho, 2008; Oneplee and Soranastaporn, 2008; Kafes, 2012; Kanoksilapatham, 2013). In this corpus, the move background covers the significance of the study, scope of the study, previous studies, the gap of the study, and current knowledge of the topic. Thus, the move background is important for the abstracts of cell biology research articles in order to provide the background information of the research to the readers. The framework of Taddio et al. (1994) did not cover the move background; therefore, the abstracts of these research articles can be analyzed based on other frameworks (e.g. Swales, 1990, 2004; Santos, 1996).

b) Conventional Moves of JCB Corpus

Based on the practice of Kanoksilapatham (2007), the conventional moves occurred in at least 60% of the corpus; therefore, this corpus includes four conventional moves: move background (98% of move occurrences), move conclusion (96% of move occurrences), move results (94% of move occurrences), and move purpose (60% of move occurrences).

Conventional Move 1: Move Background (JCB Corpus): the move background occurred the most in the abstracts of this corpus, which is an essential move of this corpus. To compare with the previous studies of moves in abstracts of research articles, most abstracts of cell biology research articles found the move background, but previous studies found very few occurrences of the move background in the abstracts of research articles (e.g. Santos, 1996; Samraj, 2005; Cross & Oppenheim, 2006; Pho, 2008; Kafes, 2012). Thus, the abstracts of cell biology are the abstracts of research articles of experiments on cells; so the authors have to provide the background information of the research including the current knowledge of the topic for the readers before reading full texts.

Conventional Move 2: Move Conclusion (JCB Corpus): based on the findings, the move conclusion is the conventional move of this corpus because it occurred in abstracts with 96% of move occurrences. This finding is consistent with the studies of Samraj (2005), Prabripoo (2009), and Oneplee and Soranastaporn (2008), which found the move conclusion in more than 60% in the corpus. The move conclusion is essential for abstracts of research articles in the field of cell biology. This is because it concerns the summary of the study showing the significance of the research including recommendations of the study. In order to help the readers

understand the concept of the research, the authors in the field of cell biology should provide the conclusion in the abstracts.

Conventional Move 3: Results (JCB Corpus): the move results are one conventional move in the abstracts of cell biology research articles because it occurred with 94% of the entire corpus. On this move, this finding is consistent with the previous studies of Bhatia (1993), Santos (1996), Samraj (2005), Cross and Oppenheim (2006), Pho (2008), Oneplee and Soranastaporn (2008), Prabripoo (2009), Kafes (2012), and Kanoksilapatham (2013). Thus, the abstracts of research articles have to include the move results in order to provide the findings of research. Obviously, the abstracts of research articles have to include the move results in order to present the findings found in the research.

Conventional Move 4: Purpose (JCB Corpus): the move purpose is one conventional move for abstracts of research articles in this field, which introduced the objectives of the study. This move is consistent with the studies of Samraj (2005), Prabripoo (2009), Kafes (2012), and Kanoksilapatham (2013), which found the move purpose in more than 60% of move occurrences in the abstracts. Therefore, the abstracts of cell biology research articles or other fields in science should present the objectives of the study in order to inform about the research.

In short, the abstracts of research articles in the field of cell biology consist of four conventional moves: move background, move conclusion, move results, and move purpose which the authors should provide in the abstracts.

c) Optional Moves of JCB Corpus

According to the frequency of moves, this corpus consists of three optional moves: research design (M2), subjects (M4), and intervention (M5). These moves occurred in less than 60% of the entire corpus. Thus, the framework of Taddio et al. (1994) covers the main compositions of abstracts in this field according to a few instances of optional moves. However, this corpus did not find the move setting (M3) and move measurement (M5), which can be said that the authors did not focus on detailed compositions of setting and measurement. The whole research article in journal of cell biology provides the information of the study by sorting introduction, results, discussion, and methods, respectively. Thus, the authors may highlight the content of method in the abstracts less than in any other section.

Thus, the abstracts of cell biology research articles include four conventional moves: background, conclusion, results, and purpose. However, to provide more details of the research, the authors can write the abstracts of research articles by putting up the compositions related to optional moves.

5.2.2 Move Sequences of JCB Corpus

The findings showed that there were six patterns of move sequences in the abstracts of cell biology research articles. The section of move sequences in this corpus is discussed in two points: the patterns of move sequences occurred in JCB Corpus and highest-frequency of move sequence occurred in JCB Corpus.

a) Patterns of Move Sequences Occurred in JCB Corpus

Six patterns of move sequences occurred in this corpus, which indicates that the organizations of abstracts in cell biology research articles have a variety of patterns. Similarly, the moves in abstracts of civil engineering research articles can be changed into various patterns based on the authors' priority (Kanoksilapatham, 2013). In this corpus, the pattern 1-5 began with move background as the first move, which was consistent with the studies of moves (e.g. Santos, 1996; Cross and Oppenhiem, 2006; Pho, 2008; Oneplee and Soranastaporn, 2008; Kafes, 2012; Knoksilapatham, 2013). Thus, the authors wanted to provide the background information first for the readers to know about the study.

Five patterns of move sequences in this corpus differed from the frameworks of Taddio et al. (1994) and Bhatia (1993) who proposed the move purpose as the first move. Obviously, the moves in the abstracts of cell biology research articles did not flow the framework of Taddio et al. (1994) because the moves of his model did not cover the move background. Hence, the abstracts of cell biology research articles can be analyzed based on the other frameworks (e.g. Swales, 1990, 2004; Santos, 1996).

b) Highest-Frequency of Move Sequence Occurred in JCB Corpus

The pattern 1 (MB-M1 other moves M7 and M8) occurred the most in the abstracts (54% of the entire corpus). Thus, this pattern is mandatory in the writing of abstracts in cell biology research articles. It includes four main moves: background, purpose, results, and conclusion. It is organized by beginning with move background,

followed by move purpose, other moves, results, and ending with move conclusion. Thus, the authors wanted to provide background information first for the readers in order to help them know what research covers, present the objective of the study in order to provide what each study does, presenting the findings of the research, and summarize the overview of ideas of each study in order to help the readers gain the concept of the study.

Thus, the abstracts of cell biology research articles can be organized in various patterns based on the authors' focuses. To help the readers gain the information effectively, the authors should write the abstracts of research articles with four main compositions: background, purpose, results, and conclusion.

5.3 Discussion of Finding 3

Research Question 3: What were the similarities and differences of the frequency and the sequence of moves in the abstracts between laboratory animal review articles and cell biology research articles?

This part of this discussion consists of move frequency and move sequences of abstracts between laboratory animal review articles and cell biology research articles.

5.3.1 Comparison of Move Frequencies in Two Corpora

The findings in the study revealed that the two corpora are different in terms of the conventional moves. Both corpora include the same conventional moves: background and purpose. Thus, both types of abstracts are in science, which the authors studied in different settings; so the authors needed to provide the background information of the study related to the importance of the study, scope of the study, current knowledge of the topic, and previous research in order to help for the readers know about the articles. The move purpose is one conventional move found in both corpora. Therefore, the abstracts of review articles and research articles have to include move purpose in order to present the objectives of the research.

However, both corpora have different aspects. The JCB corpus includes the moves of results and conclusion in the abstracts of research articles, while the

ILAR corpus excludes both moves as the conventional moves. As the abstracts of research articles concern the experiment, the authors have to present the findings of the research. In contrast, the abstracts of ILAR corpus are the abstracts of review articles which purposed to review the previous research without doing the research; therefore, the authors did not provide any results in the abstracts. For move conclusion, it is the conventional moves in the JCB corpus, which needed to sum up the importance of the study as well as main points of the study. Thus, both corpora have the same conventional moves: background and purpose, while the abstracts of cell biology research articles include other conventional moves: results and conclusion.

5.3.2 Comparison of Move Sequencing in Two Corpora

The pattern of MB-M1 other moves and M8 occurred the most in both corpora with more than 50% of occurrences in the entire corpus. This pattern explains that the authors need to prepare the readers for focusing on the topics in the abstracts by highlighting the derivation of research before indicating the move purpose, other moves, and ending with move conclusion in order to summarize the main points of the study. The readers can understand systematically by knowing first the background research including importance of research before acknowledging the other details. As a result, the readers do not have to imagine the details of articles because the authors provide the essential information in the abstracts, sufficiently.

According to the findings in both corpora, the move background is the conventional moves for both types of abstracts. Thus, the framework of Taddio et al. (1994) is not applicable for analyzing the abstracts of laboratory animal review articles and cell biology research articles because the move of background follows Swales (1990, 2004) and Santos (1996). To cover the analyzing on moves, the framework of Taddio et al. (1994) should include the moves of background provide about the importance of study, source of study, scope of study, as well as current knowledge related to the topic. Thus, the pattern of MB-M1 other moves and M8 is a mandatory sequencing of moves in both corpora. For effective analysis of the abstracts in science, the framework of Taddio et al. (1994) can be used, but it should increase the move background in the model of moves.

In short, the move background and move purpose are essential for both abstracts of laboratory animal review articles and cell biology. However, the abstracts of cell biology research articles or other fields in science have to include the move results. Lastly, the pattern of move sequence for both abstracts in this study begins with move background, followed by move purpose and other moves, and ends with the move conclusion.

5.4 Discussion of Finding 4

Research Question 4: What were the language uses of the highest-frequency move found in the abstracts of laboratory animal review articles and cell biology research articles in terms of verb choices, tenses, voices, and types of sentence?

In both corpora, the move background is the highest-frequency moves found in the abstracts, and the most frequently used language forms in the move background were finite verb, present tense, active voice, and simple sentence. From both corpora, this finding was consistent with the study of Swales and Feak (1994) that the authors used present tense to write in the introduction part, and their study found that few sentences used passive voice. However, this finding differed from the framework of Soranastaporn (2013) which proposed that the abstracts usually use past tense in the sentences.

The linguistic features, such as finite verbs, present tense, active voice, and simple sentences were used in move background for following reasons. The authors used the finite verb which has the present tense in order to indicate the fact of real event, the current knowledge related to the topic and information of science in the abstracts of laboratory animal review articles and cell biology research articles. Next, the authors wrote the sentences with the active voice because the authors needed to place emphasis on the performer or the subjects of each sentence. The active voice is stronger and more interesting than passive voice. For example, '*the endoplasmic reticulum (ER) <u>provides</u> an environment optimized …'* The subject of example is *'the endoplasmic'* performs an action by using the active verb *'provides'.* In other words, the subject of this sentence plays as the actor who did the verb *'provides'*. Finally, the

sentences of move background were written in simple sentences because the authors want to present only one main idea of information in the study in order to help the readers understand directly.

In short, the background move in the abstracts of laboratory animal review articles and cell biology research articles use finite verb, present tense, active voice to write the sentences, and all sentences in move background are in the type of simple sentences.

5.5 Implications of the Study

The current study basically aimed to study move analysis of article abstracts in order to benefit students, researchers and novice writers in the fields of laboratory animal and cell biology to be able to complete with academic world. This study demonstrated that the abstracts of laboratory animal review articles and cell biology research articles commonly followed a move structure. According to these findings, these can potentially and positively contribute to develop researchers and students in both fields. The implications are described as follows.

1. The researchers in the fields of laboratory animal and cell biology can unpack the organization text while reading and to use the pattern as a guideline when they want to write their own articles.

2. The graduate students who have to write the research article and review article can use the pattern of move sequencing as a guideline to organize their abstracts in the fields of laboratory animal and cell biology because the abstract is a part of research article and review article of the authors.

3. The teachers may gain a picture of how information is usually organized in abstracts of laboratory animal review articles and cell biology research articles. They could use this information as authentic material to teach science students how to write abstract.

4. The researchers and graduate students can use the linguistic features to write the abstracts of review articles and research articles.

Abstracts are invariably included in every article. In order to succeed in academic publication, students, researchers, and novice writers have to develop the competence of writing in English.

Chapter Summary

Two aspects in terms of move frequency and move sequences are discussed and the language uses of the highest-frequency move are presented in this chapter. From discussion, two corpora have the same two conventional moves, background and purpose, while the JCB corpus includes the convention moves, results and conclusion. In terms of move sequences, both corpora found the same pattern of move sequences which occurred the most in the entire corpus are Pattern 1 (MB-M1 other moves and M8. Finally, in both corpora, the background sentences in the abstracts have similar language uses in terms of finite verb, present tense, active voice, and simple sentence to provide information of the move background.

CHAPTER VI
CONCLUSION

The study was set out to explore the organization of abstracts of review articles and research articles in term of the frequency of moves and the move sequence in the fields of laboratory animal and cell biology. The study also sought to know the differences between the abstracts of review articles and the abstracts of research articles in two disciplines. The analytical framework used in this study is the abstract move pattern of Taddio et al. (1994). This study sought to answer four of these questions:

1. What were the frequency and the sequence of moves in the abstracts of laboratory animal review articles from ILAR?

2. What were the frequency and the sequence of moves in the abstracts of cell biology research articles from JCB?

3. What were the similarities and differences of the frequency and the sequence of moves in the abstracts between laboratory animal review articles and cell biology research articles?

4. What were the language uses of the highest-frequency move found in the abstracts of laboratory animal review articles and cell biology research articles in terms of verb choices, tenses, voices, and types of sentence?

This chapter will present the summary of the study and the recommendations for further studies.

6.1 Summary of the Study

According to the purposes, this study was to explore the frequency of moves and the sequence of moves in the abstracts of laboratory animal review articles and cell biology research articles. The dataset of this study comprised of 100 abstracts: 50 abstracts of laboratory animal review articles and 50 abstracts of research articles,

which were selected by stratified random sampling from *Institute for Laboratory Animal Research Journal* (ILAR) and *Journal of Cell Biology* (JCB) published during 2012-2014. As a result, the findings of the study can be summarized as follows:

Firstly, nine moves were found in the abstracts of laboratory animal review articles, which differed from the framework of Taddio et al. (1994). New moves were the most frequent in the abstracts, which is the background move (MB). The frequency moves in this corpus can be divided into two types: conventional moves: MB (*background*) and M1 (*purpose*) and optional moves: M2 (*research design*), M3 (*setting*), M4 (*subjects*), M5 (*intervention*), M6 (*measurement*), and M7 (*results*), and M8 (*conclusion*). In terms of the move sequences, there were ten patterns of move sequences which were organized by nine moves. Most abstracts generally began with the move background followed by the move purpose. However, the abstracts of laboratory animal review articles did not strictly follow the structural organization of MB-M1-M2-M3-M4-M5-M6-M7-M8. The mandatory pattern of moves sequence begins with move background, followed by move purpose and other moves, and ends with move conclusion.

Secondly, seven moves were found in the abstracts of cell biology research articles, which also differed from the frameworks of Taddio et al. (1994). The move background (MB) was found most often in the abstracts.. In *JCB* corpus, there are four conventional moves: MB (*background*), M8 (*conclusion*), M7 (*results*), and M1 (*purpose*), and the optional moves are M2 (*research design*), M4 (*subjects*), and M5 (*intervention*). There are six patterns of move sequences found in JCB corpus. Most abstracts begins with the move background (MB), followed by M1 and the other moves, and ends with move conclusion. Importantly, the abstracts of cell biology research articles did not strictly follow the structural organization of MB-M1-M2-M4-M5-M7-M8, but the obligatory pattern of moves sequence begins with move background, is followed by move purpose and other moves, and ends with move conclusion.

Moreover, the abstracts of laboratory animal review articles and cell biology research articles include the same conventional moves: background and purpose. The background move concerns the significance of the study, scope of the study, gap of the study, previous study, and current knowledge related to the study

which the authors need to provide at the beginning of the abstracts in order to help the readers know the overall picture of the study. The move purpose is one conventional section for two corpora, which provides the objectives of the study. In addition, both types of abstracts organized most abstracts by beginning with move background, move purpose, other moves, and ending with move conclusion. Thus, this pattern is the mandatory move sequences in both types of abstracts.

Lastly, the move background is the highest-frequency move of this corpus. The findings found that the sentences in this move were written by using finite verb, present tense, active voice, and simple sentence.

In short, the frequency of moves in the abstracts of laboratory animal review articles and cell biology research articles is similar in term of MB which occurred the most often in the abstracts and put in the beginning of abstracts. Importantly, the move background is the new move which was found in the abstracts of both fields. The findings of this study can be helpful for students, researchers, and novice writers to develop their abstract writing by using these findings as guidelines.

6.2 Recommendations for Further Studies

Based on the findings, the current study has limited application, so further studies should be carried out to gain a deeper understanding as recommended below.

1. The current study only explored the organization of moves in terms of the frequency, sequence of moves, and language uses in one move. Further studies should investigate the linguistic features in all moves in terms of tense, modal verbs, and passive and active voice, which may develop the functional language for abstracts.

2. In the case of variety of fields, further studies should be done on comparing on move structure of abstracts published by other journals in the field of science with other fields, especially linguistic and social science fields, to see whether or not the diverse fields affect the quality of abstracts.

3. Further studies should explore research articles, fully, of journals in the fields of laboratory animal and cell biology to get a better understanding of how the articles are constructed, and to produce the beneficial pedagogical resource for

students, researchers, and novice writers who wish to publish their research articles in any journals.

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APPENDICES

APPENDIX A

Frequency of Move Occurring in *ILAR* Review ArticleAbstracts

Moves	*f*	%
Move B: new move		
MB: is about background information.	47	94
Move 1 is about purpose, and asks:		
M1S1: was any information on the purpose given?	34	68
M1S2: was the purpose explicitly stated?	8	16
M1S3: was the main purpose distinguished from secondary ones?	2	4
Move 2 is limited to research design, examined with these questions:		
M2S1: was any information on the research design given?	1	2
M2S2: were technical descriptors used?	2	4
M2S3: if a follow-up study, was the duration given?	0	0
Move 3 is setting, and described with these questions:		
M3S1: was any information on the setting given?	2	4
M3S2: was the level of clinical care (e.g. primary care) indicated?	0	0
Move 4 is subjects, the following questions are asked:		
M4S1: was any information on the subjects given?	5	10
M4S2: were common demographic characteristics given?	0	0
M4S3: were technical descriptors of subject selection (e.g., random sample) used?	0	0
M4S4: was the number of subjects indicated?	1	2
M4S5: were the response and refusal rates indicated?	0	0
M4S6: was the number of dropouts and losses indicated?	0	0
M4S7: if the samples were matched were matching characteristics given?	0	0
Move 5 is intervention, examined with these question:		
M5S1: was any information on intervention given?	6	12
M5S2: were the commonest name and common synonyms given?	1	2
M5S3: was a description given?	2	4

Frequency of Move Occurring in *ILAR* Review ArticleAbstracts (cont.)

Moves	*f*	%
Move 6 is measurement, four questions are asked:		
M6S1: was any information on the measures given?	2	4
M6S2: were the variables explicitly defined?	1	2
M6S3: was the source of the data given?	0	0
M6S4: if the measurements were subjective were the observers blinded to the patient groupings?	0	0
Move 7 is result, which inquired to check:		
M7S1: were any results given?	7	14
M7S2: were they directly related to the purpose?	2	4
M7S3: were appropriate numeric data given?	1	2
M7S4: were appropriate statistical values given?	0	0
Move 8 is conclusion, six questions are asked:		
M8S1: were any conclusions drawn?	17	34
M8S2: were they directly related to the purpose?	0	0
M8S3: were they consistent with the results?	0	0
M8S4: were the study's limitations mentioned?	0	0
M8S5: were the study's implications mentioned?	16	32
M8S6: were there recommendations for further study?	8	16
Move 6 is measurement, four questions are asked:		
M6S1: was any information on the measures given?	2	4
M6S2: were the variables explicitly defined?	1	2
M6S3: was the source of the data given?	0	0
M6S4: if the measurements were subjective were the observers blinded to the patient groupings?	0	0
Move 7 is result, which inquired to check:		
M7S1: were any results given?	7	14
M7S2: were they directly related to the purpose?	2	4
M7S3: were appropriate numeric data given?	1	2
M7S4: were appropriate statistical values given?	0	0
Move 8 is conclusion, six questions are asked:		
M8S1: were any conclusions drawn?	17	34
M8S2: were they directly related to the purpose?	0	0
M8S3: were they consistent with the results?	0	0
M8S4: were the study's limitations mentioned?	0	0

APPENDIX B

Frequency of Move Occurring in *JCB* Research ArticleAbstracts

Moves	*f*	%
Move B: new move		
MB: is about background information.	49	98
Move 1 is about purpose, and asks:		
M1S1: was any information on the purpose given?	27	54
M1S2: was the purpose explicitly stated?	4	8
M1S3: was the main purpose distinguished from secondary ones?	0	0
Move 2 is limited to research design, examined with these questions:		
M2S1: was any information on the research design given?	4	8
M2S2: were technical descriptors used?	8	16
M2S3: if a follow-up study, was the duration given?	0	0
Move 3 is setting, and described with these questions:		
M3S1: was any information on the setting given?	0	0
M3S2: was the level of clinical care (e.g. primary care) indicated?	0	0
Move 4 is subjects, the following questions are asked:		
M4S1: was any information on the subjects given?	2	4
M4S2: were common demographic characteristics given?	0	0
M4S3: were technical descriptors of subject selection (e.g., random sample) used?	1	2
M4S4: was the number of subjects indicated?	0	0
M4S5: were the response and refusal rates indicated?	0	0
M4S6: was the number of dropouts and losses indicated?	0	0
M4S7: if the samples were matched were matching characteristics given?	0	0
Move 5 is intervention, examined with these question:		
M5S1: was any information on intervention given?	3	6
M5S2: were the commonest name and common synonyms given?	0	0
M5S3: was a description given?	0	0

Frequency of Move Occurring in *JCB* Research ArticleAbstracts (cont.)

Moves	*f*	%
Move 6 is measurement, four questions are asked:		
M6S1: was any information on the measures given?	0	0
M6S2: were the variables explicitly defined?	0	0
M6S3: was the source of the data given?	0	0
M6S4: if the measurements were subjective were the observers blinded to the patient groupings?	0	0
Move 7 is result, which inquired to check:		
M7S1: were any results given?	47	94
M7S2: were they directly related to the purpose?	2	4
M7S3: were appropriate numeric data given?	0	0
M7S4: were appropriate statistical values given?	0	0
Move 8 is conclusion, six questions are asked:		
M8S1: were any conclusions drawn?	37	74
M8S2: were they directly related to the purpose?	1	2
M8S3: were they consistent with the results?	1	2
M8S4: were the study's limitations mentioned?	0	0
M8S5: were the study's implications mentioned?	18	36
M8S6: were there recommendations for further study?	0	0
Move 6 is measurement, four questions are asked:	0	0
M6S1: was any information on the measures given?	0	0
M6S2: were the variables explicitly defined?	0	0
M6S3: was the source of the data given?	0	0
M6S4: if the measurements were subjective were the observers blinded to the patient groupings?		
Move 7 is result, which inquired to check:	47	94
M7S1: were any results given?	2	4
M7S2: were they directly related to the purpose?	0	0
M7S3: were appropriate numeric data given?	0	0
M7S4: were appropriate statistical values given?		
Move 8 is conclusion, six questions are asked:	37	74
M8S1: were any conclusions drawn?	1	2
M8S2: were they directly related to the purpose?	1	2
M8S3: were they consistent with the results?	0	0
M8S4: were the study's limitations mentioned?	18	36

APPENDIX C

Samples of Review Article Abstracts

1. Confinement in metabolism pens may provoke a stress response in alpacas that will reduce the welfare of the animal and jeopardize the validity of scientific results obtained in such pens. In this study, we tested a protocol designed to successfully train alpacas to be held in a specially designed metabolism pen so that the animals' confinement would not jeopardize their welfare. We hypothesized that the alpacas would show fewer behaviors associated with a response to stress as training gradually progressed, and that they would adapt to being in the confinement of the metabolism pen. The training protocol was successful at introducing alpacas to the metabolism pens, and it did reduce the incidence of behavioral responses to stress as the training progressed. The success of the training protocol may be attributed to the progressive nature of the training, the tailoring of the protocol to suit alpacas, and the use of positive reinforcement. This study demonstrated that both animal welfare and the validity of the scientific outcomes could be maximized by the gradual training of experimental animals, thereby minimizing the stress imposed on the animals during experimental procedures.

(Lund, Maloney, Milton, & Blache, 2012)

2. Ethical practices in ecological field research differ from those in laboratory research in more than the technical setting and the important distinction between population-level and individual-based concerns. The number of stakeholders affected by the conduct of field research is far larger; private landholders, public water utilities, public land managers, local industries, and communities large and small are only some of those who may be impacted. As research review boards move to establish specific ethical practices for field biologists, the process of identifying appropriate standards will affect the degree to which research will ultimately be disrupted. Standards that lead to research protocols that alienate key interests are not likely to be sustainable. Already, standards that have conflicted with the primary values of a key interest have resulted in disruptions to research and scientific progress. One way to manage this problem of deeply competing interests is to avoid the deepest offenses to any relevant interest group in the design of a proposed study. This is an application of the precautionary principle and is likely to generate a more sustainable balance among competing interests. Unfortunately, this process is also likely to be a never-ending, consensus-seeking process. Fortunately, scientists can have enormous influence on the process if they choose to engage in it early. If scientists use their expertise to function as honest brokers among affected interests, their own interest in scientific research progress is likely to be better met.

(Farmer, 2013)

Samples of Review Article Abstracts (cont.)

3. Peripheral neuropathy is a common and dose-limiting side effect of many chemotherapeutic drugs. These include platinum compounds, taxanes, vinca alkaloids, proteasome inhibitors, and others such as thalidomide and suramin. Although many rodent models have been developed using either mice or rats, there is limited consistency in the dose or mode of delivery of the drug; the sex, age, and genetic background of the animal used in the study; and the outcome measures used in evaluation of the peripheral neuropathy. Behavioral assays are commonly used to evaluate evoked sensory responses but are unlikely to be a good representation of the spontaneous sensory paresthesias that the patients experience. Electrophysiologic tests evaluate the integrity of large myelinated populations and are useful in drugs that cause either demyelination or degeneration of large myelinated axons but are insensitive to degeneration of unmyelinated axons in early stages of neuropathy. Histopathologic tools offer an unbiased way to evaluate the degree of axonal degeneration or changes in neuronal cell body but are often time consuming and require processing of the tissue after the study is completed. Nevertheless, use of drug doses and mode of delivery that are relevant to the clinical protocols and use of outcome measures that are both sensitive and objective in evaluation of the length-dependent distal axonal degeneration seen in most chemotherapy-induced peripheral neuropathies may improve the translational utility of these rodent models.

(Hoke & Ray, 2014)

4. The peripheral nervous system (PNS) comprises the cranial nerves, the spinal nerves with their roots and rami, dorsal root ganglia neurons, the peripheral nerves, and peripheral components of the autonomic nervous system. Cell-mediated or antibody-mediated immune attack on the PNS results in distinct clinical syndromes, which are classified based on the tempo of illness, PNS component(s) involved, and the culprit antigen(s) identified. Insights into the pathogenesis of autoimmune neuropathy have been provided by ex vivo immunologic studies, biopsy materials, electrophysiologic studies, and experimental models. This review article summarizes earlier seminal observations and highlights the recent progress in our understanding of immunopathogenesis of autoimmune neuropathies based on data from animal models.

(Soliven, 2014)

APPENDIX D

Samples of Research Article Abstracts

1. Specific proteins are concentrated within primary cilia, whereas others remain excluded. To understand the mechanistic basis of entry into cilia, we developed an in vitro assay using cells in which the plasma membrane was permeabilized, but the ciliary membrane was left intact. Using a diffusion-to-capture system and quantitative analysis, we find that proteins >9 nm in diameter (~100 kD) are restricted from entering cilia, and we confirm these findings in vivo. Interference with the nuclear pore complex (NPC) or the actin cytoskeleton in permeabilized cells demonstrated that the ciliary diffusion barrier is mechanistically distinct from those of the NPC or the axon initial segment. Moreover, applying a mass transport model to this system revealed diffusion coefficients for soluble and membrane proteins within cilia that are compatible with rapid exploration of the ciliary space in the absence of active transport. Our results indicate that large proteins require active transport for entry into cilia but not necessarily for movement inside cilia.

(Breslow, Koslover, Seydel, Spakowitz, & Nachury, 2013)

2. Munc18-1 is a soluble protein essential for synaptic transmission. To investigate the dynamics of endogenous Munc18-1 in neurons, we created a mouse model expressing fluorescently tagged Munc18-1 from the endogenous *munc18-1* locus. We show using fluorescence recovery after photo bleaching in hippocampal neurons that the majority of Munc18-1 trafficked through axons and targeted to synapses via lateral diffusion together with syntaxin-1. Munc18-1 was strongly expressed at presynaptic terminals, with individual synapses showing a large variation in expression. Axon–synapse exchange rates of Munc18-1 were high: during stimulation, Munc18-1 rapidly dispersed from synapses and reclustered within minutes. Munc18-1 reclustering was independent of syntaxin-1, but required calcium influx and protein kinase C (PKC) activity. Importantly, a PKC-insensitive Munc18-1 mutant did not recluster. We show that synaptic Munc18-1 levels correlate with synaptic strength, and that synapses that recruit more Munc18-1 after stimulation have a larger releasable vesicle pool. Hence, PKC-dependent dynamic control of Munc18-1 levels enables individual synapses to tune their output during periods of activity.

(Cijsouw et al., 2014)

Samples of Research Article Abstracts (cont.)

3. Epithelial cells develop morphologically characteristic apical domains that are bordered by tight junctions, the apical–lateral border. Cdc42 and its effector complex Par6–atypical protein kinase c (aPKC) regulate multiple steps during epithelial differentiation, but the mechanisms that mediate process-specific activation of Cdc42 to drive apical morphogenesis and activate the transition from junction formation to apical differentiation are poorly understood. Using a small interfering RNA screen, we identify Dbl3 as a guanine nucleotide exchange factor that is recruited by ezrin to the apical membrane, that is enriched at a marginal zone apical to tight junctions, and that drives spatially restricted Cdc42 activation, promoting apical differentiation. Dbl3 depletion did not affect junction formation but did affect epithelial morphogenesis and brush border formation. Conversely, expression of active Dbl3 drove process-specific activation of the Par6–aPKC pathway, stimulating the transition from junction formation to apical differentiation and domain expansion, as well as the positioning of tight junctions. Thus, Dbl3 drives Cdc42 signaling at the apical margin to regulate morphogenesis, apical–lateral border positioning, and apical differentiation.

(Zihni et al., 2013)

4. Desmosomal cadherins, desmogleins (Dsgs) and desmocollins, make up the adhesive core of intercellular junctions called desmosomes. A critical determinant of epithelial adhesive strength is the level and organization of desmosomal cadherins on the cell surface. The Dsg subclass of desmosomal cadherins contains a C-terminal unique region (Dsg unique region [DUR]) with unknown function. In this paper, we show that the DUR of Dsg2 stabilized Dsg2 at the cell surface by inhibiting its internalization and promoted strong intercellular adhesion. DUR also facilitated Dsg tail–tail interactions. Forced dimerization of a Dsg2 tail lacking the DUR led to decreased internalization, supporting the conclusion that these two functions of the DUR are mechanistically linked. We also show that a Dsg2 mutant, V977fsX1006, identified in arrhythmogenic right ventricular cardiomyopathy patients, led to a loss of Dsg2 tail self-association and underwent rapid endocytosis in cardiac muscle cells. Our observations illustrate a new mechanism desmosomal cadherins use to control their surface levels, a key factor in determining their adhesion and signaling roles.

(Chen et al., 2012)

APPENDIX E

Table of Move Coding

1. Influence of Sex Differences and Gonadal Hormones on Cocaine Addiction		
No.	**Sentence of abstract**	**Move**
1	Cocaine abuse is on the rise among women, and drug addiction studies consistently show greater responses among females than males in various cocaine-related outcomes.	
2	Animal and human studies reveal sexually dimorphic patterns in behavioral responses to cocaine in all phases of the cocaine addiction process from initiation to maintenance and relapse.	
3	Furthermore, in animal models, females require lower doses of cocaine to develop faster conditioned place preference and cocaine-induced psychomotor behaviors and sensitization.	
4	A clear picture is emerging and suggests that the biological basis of sex-specific differences in cocaine addiction lies, in part, in the disparate regulation of the central nervous system by male and female gonadal hormones and, in part, in chromosomal mechanisms that contribute to drug abuse vulnerability.	
5	The interactions of the many factors that affect sex differences appear to be complex.	
6	For example, in females, estradiol has facilitatory effects overall, whereas progesterone inhibits most cocaine responses.	
7	This review presents a discussion of sex differences and the role of gonadal hormones as the biological basis for the sexually dimorphic pattern in behavioral responses to cocaine.	

Table of Move Coding (cont.)

2. KNL1 facilitates phosphorylation of outer kinetochore proteins by promoting Aurora B kinase activity		
No.	**Sentence of abstract**	**Move**
1	Aurora B kinase phosphorylates kinetochore proteins during early mitosis, increasing kinetochore–microtubule (MT) turnover and preventing premature stabilization of kinetochore–MT attachments.	
2	Phosphorylation of kinetochore proteins during late mitosis is low, promoting attachment stabilization, which is required for anaphase onset.	
3	The kinetochore protein KNL1 recruits Aurora B–counteracting phosphatases and the Aurora B–targeting factor Bub1, yet the consequences of KNL1 depletion on Aurora B phospho-regulation remain unknown.	
4	Here, we demonstrate that the KNL1 N terminus is essential for Aurora B activity at kinetochores.	
5	This region of KNL1 is also required for Bub1 kinase activity at kinetochores, suggesting that KNL1 promotes Aurora B activity through Bub1-mediated Aurora B targeting.	
6	However, ectopic targeting of Aurora B to kinetochores does not fully rescue Aurora B activity in KNL1-depleted cells, suggesting KNL1 influences Aurora B activity through an additional pathway.	
7	Our findings establish KNL1 as a requirement for Aurora B activity at kinetochores and for wild-type kinetochore–MT attachment dynamics.	

APPENDIX F

หลักสูตรศิลปศาสตรมหาบัณฑิต
สาขาวิชาภาษาศาสตร์ประยุกต์ (นานาชาติ)
คณะศิลปศาสตร์ มหาวิทยาลัยมหิดล
โทร.i +๓๖+๑๑๐๕ โทรสาร. ๐๒-๔๔๑-๔๔๑๐

ที่ ศธ. ๐๕๑๗.๓๕/๐๐๖๔๑
วันที่ ๘ กุมภาพันธ์ ๒๕๕๙
เรื่อง ขอเชิญเป็นผู้วิเคราะห์ข้อมูล
เรียน Mr. David Coleman

ด้วย นางสาวชนิภรณ์ ภู่มณี รหัสประจำตัว ๕๗๓๗๒๑๘ นักศึกษาหลักสูตรศิลปศาสตรมหาบัณฑิต สาขาวิชาภาษาศาสตร์ประยุกต์ คณะศิลปศาสตร์ มหาวิทยาลัยมหิดล ทำวิจัยเรื่อง "MOVE ANALYSIS OF RESEARCH ABSTRACTS : A COMPARATIVE STUDY OF ILAR AND JCB JOURNALS" ปัจจุบันอยู่ในช่วงการวิเคราะห์ข้อมูล โดยมี รองศาสตราจารย์ ดร.ทรงศรี สรณสถาพร เป็นอาจารย์ที่ปรึกษา

ในการนี้หลักสูตรฯ สาขาภาษาศาสตร์ประยุกต์ พิจารณาเห็นว่า Mr. David Coleman เป็นผู้ที่มีความรู้ ความสามารถและความเชี่ยวชาญที่สอดคล้องกับหัวข้อวิทยานิพนธ์ของนักศึกษาข้างต้นเป็นอย่างดี จึงขอเรียนเชิญ Mr. David Coleman เป็นผู้วิเคราะห์ข้อมูลดังกล่าว

จึงเรียนมาเพื่อโปรดให้ความอนุเคราะห์ด้วย จักเป็นพระคุณยิ่ง

(ผู้ช่วยศาสตราจารย์ ดร.อภิลักษณ์ เกษมผลกูล)
คณบดีคณะศิลปศาสตร์

อาจารย์ที่ปรึกษา : รองศาสตราจารย์ ดร.ทรงศรี สรณสถาพร อีเมล : sctsp@mahidol.ac.th

APPENDIX G

หลักสูตรศิลปศาสตรมหาบัณฑิต
สาขาวิชาภาษาศาสตร์ประยุกต์ (นานาชาติ)
คณะศิลปศาสตร์ มหาวิทยาลัยมหิดล
โทร.i +๓๖+๑๑๐๕ โทรสาร. ๐๒-๔๔๑-๔๔๑๐

ที่ ศธ. ๐๕๑๗.๓๕/๐๐๖๔๒
วันที่ ๘ กุมภาพันธ์ ๒๕๕๙
เรื่อง ขอเชิญเป็นผู้วิเคราะห์ข้อมูล
เรียน คุณหทัยชนก อ่างหิรัญ

ด้วย นางสาวชนิภรณ์ ภู่มณี รหัสประจำตัว ๕๙๓๓๗๒๑๘ นักศึกษาหลักสูตรศิลปศาสตรมหาบัณฑิต สาขาวิชาภาษาศาสตร์ประยุกต์ คณะศิลปศาสตร์ มหาวิทยาลัยมหิดล ทำวิจัยเรื่อง "MOVE ANALYSIS OF RESEARCH ABSTRACTS : A COMPARATIVE STUDY OF ILAR AND JCB JOURNALS" ปัจจุบันอยู่ในช่วงการวิเคราะห์ข้อมูล โดยมี รองศาสตราจารย์ ดร.ทรงศรี สรณสถาพร เป็นอาจารย์ที่ปรึกษา

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จึงเรียนมาเพื่อโปรดให้ความอนุเคราะห์ด้วย จักเป็นพระคุณยิ่ง

(ผู้ช่วยศาสตราจารย์ ดร.อภิลักษณ์ เกษมผลกูล)
คณบดีคณะศิลปศาสตร์

อาจารย์ที่ปรึกษา : รองศาสตราจารย์ ดร.ทรงศรี สรณสถาพร อีเมล : sctsp@mahidol.ac.th

APPENDIX H

หลักสูตรศิลปศาสตรมหาบัณฑิต
สาขาวิชาภาษาศาสตร์ประยุกต์ (นานาชาติ)
คณะศิลปศาสตร์ มหาวิทยาลัยมหิดล
โทร.i +๓๖+๑๑๐๕ โทรสาร. ๐๒-๔๔๑-๔๔๑๐

ที่ ศธ. ๐๕๑๗.๓๕/๐๐๖๔๓
วันที่ ๘ กุมภาพันธ์ ๒๕๕๙
เรื่อง ขอเชิญเป็นผู้วิเคราะห์ข้อมูล
เรียน คุณชยพล ใบเจริญ

ด้วย นางสาวชนิภรณ์ ภู่มณี รหัสประจำตัว ๕๗๓๗๒๑๘ นักศึกษาหลักสูตรศิลปศาสตรมหาบัณฑิต สาขาวิชาภาษาศาสตร์ประยุกต์ คณะศิลปศาสตร์ มหาวิทยาลัยมหิดล ทำวิจัยเรื่อง "MOVE ANALYSIS OF RESEARCH ABSTRACTS : A COMPARATIVE STUDY OF ILAR AND JCB JOURNALS" ปัจจุบันอยู่ในช่วงการวิเคราะห์ข้อมูล โดยมี รองศาสตราจารย์ ดร.ทรงศรี สรณสถาพร เป็นอาจารย์ที่ปรึกษา

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จึงเรียนมาเพื่อโปรดให้ความอนุเคราะห์ด้วย จักเป็นพระคุณยิ่ง

(ผู้ช่วยศาสตราจารย์ ดร.อภิลักษณ์ เกษมผลกูล)
คณบดีคณะศิลปศาสตร์

อาจารย์ที่ปรึกษา : รองศาสตราจารย์ ดร.ทรงศรี สรณสถาพร อีเมล : sctsp@mahidol.ac.th

BIOGRAPHY

NAME	Miss Chaniporn Bhoomanee
DATE OF BIRTH	14 July 1991
PLACE OF BIRTH	Nakhon Sawan, Thailand
INSTITUTIONS ATTENDED	University of Phoyao, 2010-2013 Bachelor of Arts (English) Mahidol University, 2014-2016 Master of Arts (Applied Linguistics)
HOME ADDRESS	124 /1 Moo 11, Nongpho Subdistrict Takhli District, Nakhon Sawan Province, 60140 Tel. 0811812167 E-mail : chaniporn.bh@gmail.com
PUBLICATION / PRESENTATION	7th National and International Conference on Humanities and Social Science