CHAPTER 1 INTRODUCTION

This chapter aims to present the introductory information concerning the study. There are six topics as follows:

1.1 Background of the study

1.2 Rationale of the study

1.3 Purpose of the study

1.4 Limitations of the study

1.5 Significance of the study

1.6 Summary

1.1 Background of the study

With technology advancements, medicine is a rapidly changing discipline. To provide the best clinical care to patients, evidence-based medicine (EBM), or literature-based medicine, has become a crucial approach over more than 30 years. Evidence-based medicine is literature-based medicine. This means the clinical decision-making in the diagnosis, investigation or management of patients needs to be supported by published reports of research (Lang, 2009, p.1).Thus, research articles play a significant role in medical communication and health care.

Getting a manuscript published is important at all levels of medical education worldwide, including undergraduate, postgraduate and continuing medical education levels. Medical students who have published research will have more opportunity to study abroad or get a scholarship. Also, medical residents or clinical fellows need to have publications as a partial fulfilment of the requirements for their certification. Furthermore, doctors are likely to be promoted by their institutions if they have their research published.

English is accepted as today's genuine international language, a language used widely for communication between people who do not have the same first language (Harmer, 2007, p.13). Although English is the mother tongue in many countries, native speakers are greatly outnumbered by people who use English as a second or third language and

use it for international communication. According to Crystal (2003, p.69), the ratio of native to non-native English speakers is approximately 1:3. The proportion of people who have English as a first language will decrease from above 8 percent in 1950 to below 5 percent in 2050 (Graddol, 1999, p.61, cited in Crystal, 2003). In addition, English is now clearly acknowledged as an international language of medicine (Maher, 1986), as an international language of research and publication (Flowerdew, 1999, p.124) and as the language of the most widely read and quoted medical journals (Benfield and Feak, 2006, p.1728).

Maher (1986) studied languages in the *Index Medicus*, the international index of articles published in medical periodicals all over the world, during 1966-1980. The number of articles written in English rose steadily (18.9%), from 53.3% in 1996 to 72.2% in 1980. In the same period, the number of articles published in German, French, Italian, Russian, Japanese, and Spanish declined 5.1%, 3.6%, 3.3%, 2.3%, 1.1%, and 0.8%, respectively. These figures represent the increasing trend in use of the English language and the decreasing trend in the use of other languages as a medium of medical communication.

Moreover, some medical journals at a national level publish their articles only in English or in both the native language and English language to attract a wider audience, although some of them originally publish articles in the native language. This may result from the advantage of using English, which increases the accessibility of medical knowledge to audiences in other countries.

In Germany, medical research articles written in English increased from 8.2% in 1966 to 45.2% in 1980. On the contrary, medical research articles written in German decreased from 90.9% in 1966 to 54.3% in 1980 (Maher, 1986). Japan and France also had the same declining trend, although the decrease was not as sharp as that of Germany. The use of Japanese and French in medical literature dropped 9.2% in both countries during 1966-1980. Therefore, English is increasingly used not only in an international context, but also in a domestic context.

In Thailand, several medical journals require that a submitted manuscript be written only in English. These journals include *The Journal of the Medical Association of Thailand*, *The Southeast Asian Journal of Tropical Medicine and Public Health*, and *The Siriraj Medical Journal*. For example, *The Siriraj Medical Journal* indicates in its

Instructions for Authors section that, “The manuscript must be written in English with no longer than 3,000 words for the text, including abstract, acknowledgments, references, and legends for illustrations (figure legends).” Some journals specify a variety of English in their Instructions to Authors section. For instance, *The Southeast Asian Journal of Tropical Medicine and Public Health* states, “Papers should be written in English (US).” Some journals also indicate good English as a requirement. *The Journal of Health Research* states, “Manuscripts must be written in good grammatical English.” However, some journals give authors a choice by accepting both Thai and English manuscripts, such as *The Thammasat Medical Journal*, *The Songklanagarind Medical Journal* and *The Srinagarind Medical Journal*.

1.2 Rationale of the study

According to the above data, the requirement of English manuscripts reflects the importance of English in Thai medical journals. Thai medical researchers should be able to write a research article in English to increase the opportunity to submit their work to international journals, which plays an important role in career promotion. Especially, researchers regard publication in high-impact journals as an important measure of their work’s importance and influence (Chapman, 2001). Publication in these journals grants them peer recognition, academic promotion, media attention, and possibly public and governmental attention to research.

Publishing in English is crucial for graduation and career promotion, thus both students and professors are put under pressure. For example, though the primary aim of Korean professors is to publish their work in English journals, both graduate students and professors in South Korea experience difficulty in writing an English article because they have limited English proficiency (Cho, 2009, p.230). Similarly, resident physicians in neurological surgery cope with the pressure to publish because research publication is a prerequisite to complete their residency training and important to their future academic career (Eastwood, et al., 2000, p.739).

According to Mišak, et al. (2005, p.129), non-native English-speaking (NNES) authors cope with serious problems besides use of the English language when they write a manuscript. These problems are their limited knowledge of study designs, poor narrative organization and presentation, and unawareness of medical terminology.

Those difficulties include poor organization, illogical progression and incompleteness of ideas in a text.

Goben and Swan (1990, p.550) propose a solution for readable scientific writing by using rhetorical principles. These principles improve clarity and quality of scientific papers. Singer and Hollander (2009, p.89) also suggest that good organization is an essential element for good writing. Most journals require well-structured manuscripts. Generally, the structure is IMRD, which comprises Introduction, Methods, Results, and Discussion. Skelton (1994, p.455) points out that most journals advise what to do, but they do not say how to achieve it. Thus, the writers do not know exactly how they can improve their writing. For example, when asked to improve clarity, authors may not understand what level of clarity is needed to satisfy the editors. Bredan and Roy (2006, p.848) note that although there are numerous publications related to effective scientific writing, most scientists rarely pay attention to them. It is important to write in a logical way because this will enhance the readers' understanding, and the readers will find the paper convincing enough to cite. As a result, a well-written manuscript can increase the chance of being cited. The aim to disseminate knowledge is achieved.

In 1990, Swales developed a framework called move analysis, which is the study of rhetorical organization of a text into units called moves and steps. He proposed a CARS (Create a Research Space) model for research article introductions. After that, move analysis has been extensively used to study rhetorical organization of various texts in several disciplines such as medicine (Nwogu, 1997), computer science (Posteguillo, 1999), biology (Samraj, 2002), and biochemistry (Kanoksilapatham, 2005). Some English-language teachers applied the results from move analysis to their classrooms.

This approach is called genre-based instruction (GBI). It focuses on raising students' awareness of the rhetorical structure and its communicative purpose, which are called "moves" in genre study. Teachers explicitly teach their students about the structure of a text, its purposes, and examples of patterns in each purpose. For example, in an abstract writing lesson, the teacher starts a lesson by introducing the abstract as a genre, describing its structure, explaining "moves" or communicative purposes of writing an abstract, and giving some examples of each purpose. Then, the teacher gives some abstracts to the students to analyze according to moves. After the move analysis, the students understand the generic structure of an abstract, and they write their own

abstract using structural patterns in each move as examples. The instruction has been proved to help students organize their texts to fulfill readers' expectations, and boost students' confidence in writing (Kongpetch, 2003; Cargil and Connor, 2006).

Given that the English language is used and the discipline is medicine, the internal structure (moves and steps) of IMRD articles should be similar. However, the use of English in different contexts and for different target audiences may affect the internal structure of the research articles. English used in international medical journals is regarded as an international language in a global context; while English used in Thai (national) medical journals is regarded as an international language in a local context. It is assumed that English used in Thailand is influenced by the Thai way of thinking and Thai culture. Thus, these assumptions lead the researcher to investigate the two kinds of journals, Thai (national) and international medical journals. These kinds of journals are under the same medical research article genre, but they are at different levels: national and international levels.

Among the four sections, the Introduction section is considered the most difficult part for nearly all writers (Swales, 1990, p.137). The introduction is the first section of a research article, and it should effectively provoke the readers to read the rest of the article. According to Cho's (2009, p.236) study, writers have a hard time when they write the Introduction section. The writers need to make a lot of decisions while writing this part, such as the amount and type of background knowledge to present, how to persuade the audience, and the directness of the approach they should adopt in their writing. Therefore, this research focuses on the Introduction section of medical research articles.

Until now, there has been no comparative study on moves and steps of medical research articles published in Thai medical journals and international medical journals. Thus, move analysis in this research will reveal the similarities and differences between these kinds of journals. The results will enhance writers' understanding of rhetorical organization of a research article so that their writing meets the expectations of international or national journals, to which they aim to submit their work.

1.3 Purpose of the study

The primary aim of this study is to explore rhetorical organization of medical research article introductions written in English language by using move analysis as a framework. This research intends to compare the structure of medical research article introductions published in two kinds of journals, Thai (national) and international medical journals.The following are the research questions of this study:

1. What are the moves and steps of the Introduction section in English medical research articles published in Thai medical journals?

2. What are the moves and steps of the Introduction section in English medical research articles published in international medical journals?

3. What are the similarities and differences in the moves and steps between English medical research article introductions published in Thai medical journals and international medical journals?

1.4 Limitations of the study

Although the findings should be applicable to a range of contexts, there are some limitations that should be noted. First, the size of the corpora in this study is small because the focus is on the Introduction section, and the number of words in each introduction was limited to exclude extremely short and long introductions. Although the small size is sufficient for analyzing moves and steps in a specialized corpus, the corpus size should be as large as possible to increase its reliability. Second, this study examines only the Introduction section, so it does not provide a complete analysis of a research article. The findings will not be generalized to other sections. Finally, this study does not take into account the nationality of the writers. In Thai medical journals, the majority of authors are Thai. For international medical journals, authors are of varied nationalities. As the aim of this study is to analyze moves and steps in research articles of Thai and international medical journals, it is assumed that the selected introductions represent the conventions of journals they are drawn from. Thus, the analysis of this study is not concerned with authors' nationality.

1.5 Significance of the study

The results from this move analysis could be helpful in various ways. First, medical professionals, medical writers, and medical researchers may gain a better understanding of the organization of medical research article introductions. They can also use some text structure templates as a model for their writing to help them organize an article to meet readers' expectations, whether they aim to publish at a national or international level. Secondly, teachers of research writing, especially medical writing, may find this study helpful for preparing lessons and comprehending the structure of research articles. Finally, material developers may use this study to design materials for medical research writing courses, to raise students' awareness of differences in the two kinds of journals and teach them how to write appropriately for national or international journals.

1.6 Summary

This chapter has addressed the general background, rationale, and purpose of the study. Limitations and significance of the study were also described. The next chapter will provide more information on the review of literature related to corpus-based approach, genre analysis, move analysis, and medical research articles.

CHAPTER 2 LITERATURE REVIEW

This chapter aims to present a review of the literature related to this research study. The headings are as follows:

2.1 Corpus-based approach

2.2 Genre analysis

2.3 Move analysis

2.4 Medical research article

2.5 Summary

2.1 Corpus-based approach

2.1.1 Definition of corpus

The term "corpus" has been defined by several scholars. Hunston (2002, p.2) gives a definition of a corpus as "a collection of naturally occurring examples of language, consisting of anything from a few sentences to a set of written texts or tape recordings, which have been collected for linguistics study." Another definition given by Bowker and Pearson (2002, p.9) is "a large collection of authentic texts that have been gathered in electronic form."

According to the Longman Dictionary of Language Teaching and Applied Linguistics (Richards and Schmidt, 2002, p.126), a corpus is a "collection of naturally occurring samples of language which have been collected and collated for easy access by researchers and materials developers who want to know how words and other linguistic items are actually used." These definitions show that the term "corpus" can be defined in terms of both its form (a collection of naturally occurring samples of language) and its purpose (collected for linguistics study or material development).

In this study, a corpus is a sample of written language used by medical researchers in English medical research article introductions, collected to investigate organizational patterns called *moves* and *steps* (See definitions of moves and steps in 2.3.1). In order to

compare the similarities and differences, two corpora were compiled: a Thai medical journal corpus and an international medical journal corpus.

2.1.2 Types of corpus

There are many different types of corpora. A corpus can be designed in several ways depending on its purpose. For example, a corpus may be categorized according to its content (general and specialised corpora), the number of languages (monolingual and multilingual corpora), and mode of communication (spoken and written corpora). Below are some commonly used corpus types, which are relevant to this research (Bowker and Pearson, 2002; Hunston, 2002):

- **General corpus**

A general corpus consists of many types of texts which may include spoken or written language, or both, and may include texts produced in one country or many. A general corpus is designed to represent as wide a range of texts as possible. This type of corpus is usually large, and it is often used as a 'reference corpus.' Some well-known general corpora include the British National Corpus (100 million words) and the Bank of English (400 million words in January 2001); both corpora consist of a range of sub-corpora from different sources.

- **Specialised corpus**

This type of corpus contains texts of a specific type, such as newspaper editorials, television broadcasts, academic articles in a particular subject, essays written by students, etc. The purpose of designing a specialised corpus is to represent the language used within a particular genre, discipline or group. Some well-known specialised corpora include the 5-million-word Cambridge and Nottingham Corpus of Discourse in English (CANCODE), representing informal registers of British English, and the Michigan Corpus of Academic Spoken English (MICASE), representing spoken registers in a US academic setting. However, linguistics researchers often collect their own specialised corpus to explore the kind of language they want to study. Although there is no limit to the degree of specialisation involved, some parameters are set to limit the types of texts included in a study. For example, a corpus may be designed by setting a specific time frame,

consisting of texts from a particular century, or setting a specific social situation, such as conversations taking place in a bookshop, or setting a specific topic, such as newspaper articles about the European Union.

- **Comparable corpora**

Comparable corpora are two (or more) corpora in different languages, such as English and Spanish, or in different varieties of a language, such as Indian English and Canadian English. The purpose of compiling comparable corpora of varieties of the same language is to compare those varieties. An example of comparable corpora is the ICE corpora (International Corpus of English), comprising 1 million words each of different varieties of English.

- **Parallel corpora**

Parallel corpora are two (or more) corpora in different languages, each consisting of texts that have been translated from one language into the other (e.g. a novel in English that has been translated into Spanish, and one in Spanish that has been translated into English), or texts that have been produced simultaneously in two or more languages (e.g. European Union regulations, which are published in all the official languages of the EU). This type of corpus is mainly used in contrastive studies and translation studies. For example, parallel corpora can be used to investigate similarities and differences of organizational patterns and linguistic features in two languages. Moreover, translators and language learners can use parallel corpora to find potentially equivalent expressions in each language and to explore differences between languages.

A corpus can be a combination of several types of corpora, depending on its purposes. For instance, the European database of Technical Regulations Information System (TRIS) is classified as a specialised, parallel corpus of Spanish and German texts. This corpus is considered specialised because it contains specialised texts from the European Commission and the DG Enterprise and Industry Project. As the TRIS corpus consists of texts in two languages, Spanish and German, it is regarded as a parallel corpus.

In this study, the specialised, comparable corpora of the Introduction section of a research article in Thai and international journals were compiled, and the differences of moves and steps were investigated.

2.1.3 Corpus design

Although there are many ready-to-use corpora, constructing one's own corpus, sometimes called a DIY (do-it-yourself) corpus, is essential because researchers often find that some publicly available corpora are unable to address their research questions (McEnery, Xiao, and Tono, 2006). To design a DIY corpus which ensures high reliability, four aspects are important for consideration: size, content, balance and representativeness.

2.1.3.1 Size

The size of a corpus refers mainly to the number of words in the corpus. However, issues of size in corpus design also involve the number of texts from different categories, the number of samples from each text, and the number of words in each sample (Biber, Conrad, and Reppen, 1998). The issue of proper corpus size is debateable. A larger corpus is likely to provide more reliable findings than a smaller corpus, especially for quantitative studies.

However, some scholars believe that a small corpus is also sufficient for analysis. First, small corpora may contain sufficient examples of common linguistic features. For example, a sample of 1,000 words is enough for identifying frequent grammatical features (Biber, Conrad, and Reppen, 1998). Second, small specialised corpora are considered appropriate as they are used to investigate research questions different from those of large multimillion-word corpora. For instance, corpora for grammatical studies are smaller than those for lexical studies. Third, corpora that require manual annotation are restricted in size. Finally, some corpus tools establish a limit on the number of concordances that can be extracted; for example, WordSmith version 3 can extract 16,868 concordances at a maximum (McEnery, Xiao, and Tono, 2006). Thus, the optimum size of a corpus depends on research questions of each study.

2.1.3.2 Content

The most critical factors for choosing what should go into a corpus are the purpose of the research and availability of the texts (Hunston, 2002). For example, a researcher wishing to study academic articles in physics may simply collect only published articles if the researcher thinks these texts are adequate for answering research questions. Additionally, a number of issues may be considered, such as:

- Will the articles come from one journal, or from a range of journals? How will the journal(s) be selected?
- Will the articles chosen be restricted to those apparently written by native speakers of the target language, or not?
- Will articles other than research articles, such as book reviews, be included?

These questions should be taken into consideration. The best choice in each question depends on the purpose of the study (Hunston, 2002).

2.1.3.3 Balance

The acceptable balance of a corpus is defined by its intended uses. A balanced corpus generally consists of a broad range of text types which are considered representative of the language or language variety of the study. Typically, these text types are sampled proportionally for inclusion in a corpus. The British National Corpus (BNC) is widely accepted as an example of a balanced corpus. The BNC creators sampled a wide variety of distinct types of material and selected examples of those types which have a wide distribution (McEnery, Xiao, and Tono, 2006).

2.1.3.4 Representativeness

According to McEnery, Xiao, and Tono (2006), representativeness is determined by two issues: the range of text types included in a corpus (balance) and how the text chunks for each text type are chosen (sampling). Although both general and specialised corpora should be representative of a language or a language variety, the representativeness of these types of corpora is determined differently. The representativeness of a general corpus relies on sampling from a wide range of genres, while the representativeness of a specialised corpus tends to be restricted to a particular domain, such as medicine or engineering, or genre, such as newspaper text or academic prose (McEnery, Xiao, and Tono, 2006).

2.2 Genre analysis

2.2.1 Definition of genre, genre analysis and discourse community

Swales (1990, p.58), a pioneer of genre analysis, defines a genre as a type of communicative event produced by a discourse community that has some shared communicative purposes. According to Richards and Schmidt (2002), a genre is "a type of discourse that occurs in a particular setting, that has distinctive and recognizable patterns and norms of organization and structure, and that has particular and distinctive communicative functions". Examples of genre include business reports, news broadcasts, speeches, letters, and advertisements. Genre is a discoursal unit that performs a coherent communicative function, such as indicating a gap.

Based on the above definitions, communicative purposes are essential for genre identification. Therefore, in this study, genre is a type of written or spoken discourse that has distinctive communicative purposes that are shared and recognized by a particular discourse community.

Based on the above definition of genre, genre analysis is the study of a type of written or spoken discourse that has distinctive communicative purposes that are shared and recognized by a particular discourse community.

The concept of "discourse community" closely relates to genre, so it is necessary to define this term. According to the Longman Dictionary of Language Teaching and Applied Linguistics (2002, p.161), a discourse community is "a group of people involved in a particular disciplinary or professional area (e.g. teachers, linguists, doctors, engineers) who have therefore developed means and conventions (of language) for doing so (working in their professional areas)". From this definition, a discourse community can belong to any discipline. Killingsworth (1992) views a discourse community as a communication system of interconnected and interrelated individuals. Each participant in this system acts as both a sender and a receiver of information.

Although definitions of discourse community are given by several scholars, the definition given by Swales is a key definition to identify a particular group as a discourse community (Helán, 2012, p.35). Swales (1990, p.9) defines a discourse community as a sociorhetorical network that is formed to work towards sets of common

goals. He also lists six defining characteristics of a discourse community, as stated below:

> *1. Having a broadly agreed set of common public goals*
> *2. Having mechanisms of intercommunication among its members*
> *3. Using its participatory mechanisms primarily to provide information and feedback*
> *4. Utilizing and hence possessing one or more genres in the communicative furtherance of its aims*
> *5. Acquiring some specialist lexis*
> *6. Having a threshold level of members with a suitable degree of relevant content and discoursal expertise (1990, p.24-27)*

Based on the above definitions, a discourse community is a group of people involved in a particular disciplinary area who have shared goals, language, and practices. The medical discourse community, sometimes called the discourse community of medical professionals, fulfills these criteria.

First, the common public goals of a medical discourse community are to improve peoples' well-being by treatment and prevention of disease, to educate people about health, and to advance medical knowledge. Secondly, there are a variety of mechanisms of intercommunication among medical professionals, such as textbooks, printed or electronic journals, bulletins and newsletters, conferences, seminars, hospital rounds, etc. (Helán, 2012, p.72-73). Third, the members of a medical discourse community share and exchange information through the mentioned mechanisms in both written and spoken forms.

Fourth, the genres of medical discourse community include the write-up of history and physical examination, progress note, discharge summary, research article, grant proposal, letter to referring doctor, outpatient records, consultation report, admitting note, student evaluation, and communications to patients (Helán, 2012, p.76). The next feature is a specific lexis. Medical discourse is full of specialized terminology which sounds complicated to people outside of the medical field. Finally, to become a member of the medical discourse community, a person has to complete medical education and obtaining a Doctor of Medicine (M.D.) degree. A medical doctor acquires knowledge

and skills through preclinical and clinical courses, and internship. Therefore, the medical discourse community is a discourse community according to Swales's criteria.

2.2.2 Three traditions of genre analysis

Genre analysis has been developed separately in the three research traditions: English for Specific Purposes (ESP), North American New Rhetoric studies, and Australian systemic functional linguistics (Hyon, 1996, p.694).

First, the ESP school analyzes the spoken and written discourse of non-native speakers in academic and professional settings. The researchers in this field view genre as oral and written text types defined by their communicative purposes and patterns in social contexts.

The second tradition, the North American New Rhetoric studies, focuses on the interaction between text and context. With this concept, situational contexts and social actions are important factors for participants to consider how to respond appropriately in a particular situation, so this tradition employs ethnographic methods for analyzing texts.

Finally, the Australian systemic functional linguistics has been influenced by the theory of Systemic Functional Linguistics (SFL), developed by Michael Halliday (Hyon, 1996, p.696). The SFL approach focuses on register analysis, which is the analysis of three key features of the surrounding social context, namely, field, tenor and mode.

As this study aims at investigating medical research articles and their communicative purposes and patterns, the structural moves analysis is an appropriate methodology. Thus, this study falls into the ESP tradition.

2.2.3 ESP tradition

In the ESP context, genre analysis can be done by two approaches: examining linguistic features at the sentence level and examining rhetorical structure (moves and steps) of texts (Thompson, 2001). Some studies may focus either on linguistic features or rhetorical structure. Some studies may investigate both features.

First, researchers may investigate only lexicogrammatical features of a genre. For example, Salager-Meyer (1992) investigated the distribution of verb tenses (present

simple, present perfect, past simple, past perfect, and future tense) and modals (may, can, should, must, could, and might) in 84 medical English abstracts from four different types of medical research, namely, clinical, basic, epidemiologic, and operative research. Tarone, et al (1981) examined the use of the passive in two astrophysics journal papers. In Carter-Thomas and Rowley-Jolivet's study (2008), if-conditionals in three genres of medical discourse, namely, research articles, conference presentations, and editorials, were analyzed. Hyland (2002) compared the use of personal pronouns between 64 Hong Kong undergraduate theses and a large corpus of research articles.

Second, only structural move analysis may be conducted. After Swales (1990) proposed the CARS (Create a Research Space) model, move analysis has been employed to analyze a variety of genres. Nwogu (1997) identified moves in all sections of medical research articles. Henry and Roseberry (2001) studied move patterns of letters of application. Personal statements were also identified in a move analysis by Ding (2007). Hyland (2004) examines the generic structure of the acknowledgements in MA and PhD dissertations written by students from six academic disciplines at five Hong Kong universities.

Finally, both linguistic features and rhetorical structure may be examined. For instance, Kanoksilapatham (2003) combined move analysis with multidimensional analysis, which is a study of the co-occurrence of linguistic features. After identifying 15 moves in the four sections of biochemistry research articles, 41 linguistic features were analyzed. Some of these features include passives, past tense verbs, quantifiers, references, and prepositions.

As the present study focuses on rhetorical structures of the medical research article genre, it falls into the second type, structural move analysis.

2.3 Move analysis

After Swales developed a CARS (Create a Research Space) model for research article introductions in 1990, move analysis has been extensively used by many scholars in genre studies. To understand move analysis, a definition of move analysis is described. The two approaches of move analysis are also discussed in this section.

2.3.1 Definition of move, step and move analysis

Swales (2004) defines a move in genre analysis as "a discoursal or rhetorical unit that performs a coherent communicative function, which is a purpose to communicate of that text segment such as indicating a gap and announcing present research, in a written or spoken discourse". According to Nwogu (1997, p.122), move refers to "a text segment made up of a bundle of linguistic features (lexical meaning, propositional meanings, illocutionary forces, etc.) which give the segment a uniform orientation and signal the content of discourse in it". Based on this definition, a text segment is recognized as a move if there is an association between a function and the linguistic clues. These linguistic clues can be function words, explicit lexemes and expressions, verb forms, discourse conjuncts and markers, structural headings and subheadings, summary statements, etc. For example, the function "indicating a gap in previous research" can be realized by the conjunctive adverb "however" and the explicit lexemes "has not been investigated" as in the below excerpt from Nwogu's study (1997).

> *However, the possible prevention of PIH and pre-eclampsia in primigravidae by suppression of platelet TXA2 production with low dose aspirin has not been investigated.*

Each move consists of a number of steps. After a move in a text segment is identified, it can be identified further as a step. Nwogu (1997) calls these steps "constituent elements". Kanoksilapatham (2003) notes that each move also serves the overall communicative function of the genre.

In this study, a move is identified as a text segment which performs a specific communicative function that can be inferred from the context and linguistic clues. A step is identified as a sub-unit of a move that is chosen by a writer to support the move's communicative function. A move can consist of several steps.

Move analysis is "the identification of a number of 'moves' (various communicative functions) used in the text" (Manvender, Yasmin, and Shamsudin, 2012, p.1239). According to Feng (2006), move analysis is the identification of "the semantic/functional units of texts – moves and steps (sub-units under the unit of move)". Another definition given by Jogthong (2001, p.7) is "a study of how language

made by the writer forms a meaningful unit by identifying its forms and functions in the discourse".

Therefore, move analysis is the study of a text segment by identifying communicative functions within text segments.

2.3.2 Approaches of move analysis

Discourse analysis is a general term for the analysis of language "beyond the sentence." There are two approaches to discourse analysis: top-down corpus-based, and bottom-up corpus-based. Biber, Connor and Upton (2007) propose that there are seven major analytical steps as shown below:

- **Communicative/Functional categories**: Determine the categories of discourse units, which are communicative functions that discourse units serve in the corpus.
- **Segmentation**: Segment all texts in the corpus into well-defined discourse units.
- **Classification**: Identify and label the type of each discourse unit in each text of the corpus.
- **Linguistic analysis of each unit**: Analyse the linguistics features of each discourse unit in each text of corpus.
- **Linguistic description of discourse categories**: Describe the typical linguistic features of each discourse unit category, by comparing all discourse units of a given category across the texts of the corpus.
- **Text structure**: Describe the discourse structure of particular texts as sequences of discourse units, in terms of the general category or type of each of those units.
- **Discourse organizational tendencies**: Describe general patterns of discourse organization that hold across all texts of the corpus.

These similar analytical steps can be done in both top-down and bottom-up approaches, but some steps are in different orders as shown in Table 2.1.

2.3.2.1 Top-down approach

In the top-down corpus-based approach, the analytical framework including communicative functions is developed first, and then the text segmentation and functional identification are done, followed by linguistic analysis.

Originally, Swales developed move analysis as a top-down approach (Upton and Cohen, 2009). Then, linguistics researchers followed his methodology. This approach tends to be the principal approach in move analysis at present (Lieungnapar and Watson Todd, 2011). However, this approach has been questioned by some academics. The notion of communicative purpose has become more complex, multiple, variable and subjective (Askehave and Swales, 2001). Lassen (2006, p.505) states that there seems to be no one-to-one relationship between communicative function and linguistic form. In addition, Upton and Cohen (2009) claim that this top-down approach is highly labour-intensive.

Table 2.1 Comparison of required steps between top-down corpus-based approach and bottom-up corpus-based approach

Top-down approach	Bottom-up approach
1. Communicative/Functional categories	1. Segmentation
2. Segmentation	2. Linguistic analysis of each unit
3. Classification	3. Classification
4. Linguistic analysis of each unit	4. Linguistic description of discourse categories
5. Linguistic description of discourse categories	5. Communicative/Functional categories
6. Text structure	6. Text structure
7. Discourse organizational tendencies	7. Discourse organizational tendencies

2.3.2.2 Bottom-up approach

For the bottom-up corpus-based approach, the segmentation is done first, then linguistic analysis is performed, and communicative functions are described later. Although the

bottom-up approach seems more objective, it may not be the best move analysis for every case. Swales (2004) agrees with Nwogu (1997) that move identification is likely to be a bottom-up process, but it is also influenced by "intuitions derived from our schemata about the structuring of text-types and genres".

According to a comparative study by Lieungnapar and Watson Todd (2011), most of the moves found by these two approaches are similar. They suggest that top-down approach is appropriate for an investigation focusing more on the context as it allows researchers to analyse texts as context. Kanoksilapatham (2005) points out that coding of research articles in the hard sciences, bio-sciences, and social sciences requires a coder who has expertise in the respective discipline. In addition, Askehave and Swales (2001) recommend that content analysis should include not only what is said, but also what is not said, as there are some omissions of textual silences in written scientific discourse due to professional and disciplinary conventions that are understood in the context (Dressen, 2002).

In move analysis, the primary focus is the communicative functions. Moreover, medical research articles are texts in the context of the medical field. To understand the content of the corpora, shared knowledge of the medical discourse community is essential. Schema is important to identify moves and steps in a specialized corpus. Therefore, this study mainly uses the top-down approach. To make the coding process more objective, linguistics clues were also used.

2.3.3 Move analysis models

Swales is a pioneer in move analysis studies. He (1990) studied the Introduction section extensively and developed a CARS (Create a Research Space) model for research article introductions. This name is an ecological metaphor referring to "ecological competition for research space in a tightly contested territory" (Swales, 2004). In other words, a research field is compared to a territory in ecology, and a specific research topic is a niche. Researchers have to survey a wider area around their target area before introducing their research. Occupying a niche in the research world is as competitive as settling down in real life.

2.3.3.1 Swales's move analysis models

- **Swales's 1990 CARS model**

The Swales's 1990 CARS model consists of three moves: *Move 1 Establishing a territory, Move 2 Establishing a niche,* and *Move 3 Occupying the niche,* as shown in Figure 2.1. The moves and steps in this model are described below:

In *Move 1 Establishing a territory,* writers provide background information to help readers understand the area of investigation, or 'territory' as in the move label. This move consists of three steps: *Step 1 Claiming centrality, Step 2 Making topic generalization(s)* and *Step 3 Reviewing items of previous research*. Examples of these steps in *Move 1* are shown in Figure 2.2 (Swales, 1990).

Step 1 Claiming centrality shows that the research topic is useful, relevant, important, or worth investigating. According to Figure 2.2, the phrases "increasing interest", "has heightened the need" and "of particular interest and complexity" indicate the importance of high-angle-of-attack aerodynamics, so these first two sentences are coded as *Step 1*.

Step 2 Making topic generalization(s) provides the overviews about the research field. The contents in this step can be knowledge, consensus, practice and description of phenomena. "The main flow features", mentioned in sentence no. 3 of Figure 2.2, signals topic generalization.

Step 3 Reviewing items of previous research presents information from relevant studies in the discipline. This can be seen from citation numbers (2-4, 5-8, 9) at the end of sentence no. 4, the reporting verb "mentioned" in sentence no. 5, and the reporting verb "found" and the citation (Ref. 10) in sentence no. 6.

Move 2 Establishing a niche connects *Move 1* and *Move 3*. After 'establishing a territory', the writers justify their research topic, so the readers understand why this is an area needing investigation. This move consists of four steps: *Step 1A Counter-claiming, Step 1B Indicating gap, Step 1C Question-raising,* and *Step 1D Continuing a tradition*.

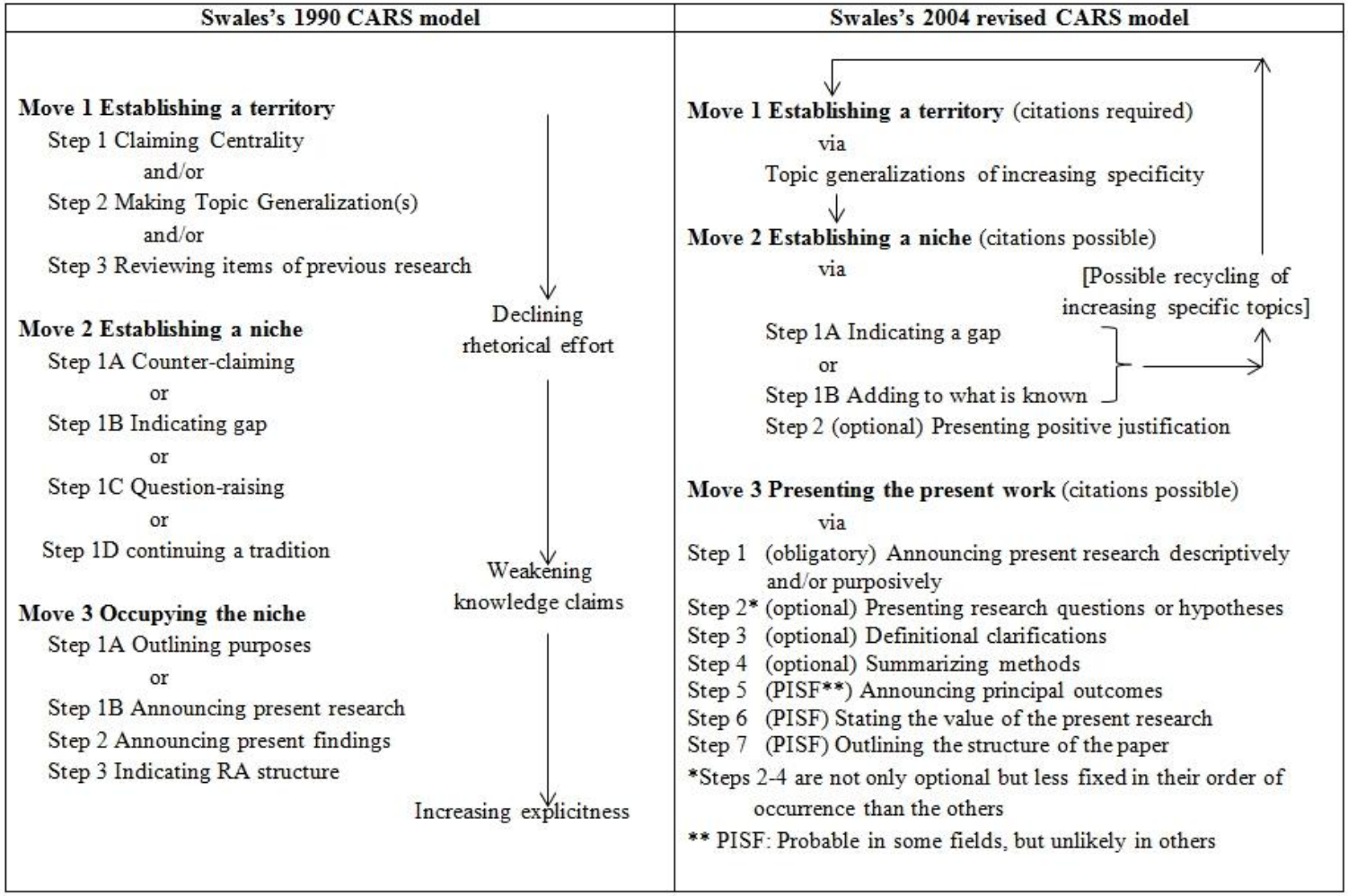


Figure 2.1 Swales's 1990 CARS model and Swales's 2004 revised CARS model

Title: High Angle-of-Attack Calculations of the Subsonic Vortex Flow in Slender Bodies Source: AIAA Journal, 1985; 23 (8): 1150-6 Adapted from: Swales (1990, p.143)	
(1) The increasing interest in high-angle-of-attack aerodynamics has heightened the need for computational tools suitable to predict the flow field and the aerodynamic coefficients in this regime. (2) Of particular interest and complexity are the symmetric and the asymmetric separated vortex flows which develop about slender bodies as the angle of attack is increased.	MOVE 1 STEP 1
(3) The viscous influence on the separation lines and the unknown three-dimensional (3D) shape of the vortex wake are some of the main flow features that must be modeled in the construction of a computational method to properly treat this problem.	MOVE 1 STEP 2
(4) Among the many potential flow methods developed in attempting to solve body vortex flows are early two dimensional (2D) multivortex methods, [2-4] 2D time-stepping vortex models that include boundary-layer considerations, [5-8] and a quasi-3D potential flow method[9] that uses source and vortex elements. (5) Linear, unseparated potential flow models as well as purely viscous models, are not mentioned here. (6) A survey of the various methods may also be found in Ref.10.	MOVE 1 STEP 3

Figure 2.2 Coding examples of *Steps 1-3* in *Move 1* using Swales's 1990 CARS model

In *Move 2*, *Step 1A Counter-claiming* presents the restraints and negative evaluation of previous research. *Step 1B Indicating gap* shows a research space that has not yet been studied. *Step 1C Question-raising* is presented by asking direct or indirect questions. *Step 1D Continuing a tradition* shows weaker claims (Swales, 1990). In *Step 1D*, the writers express their interests in that research area following previous studies.

Following are examples of steps in *Move 2* (Swales, 1990, p.142). Under the same research topic, modifying some words in a sentence can change the step of that sentence because this may change the sentence's communicative purpose. For example, having the expression "in such a degree of spherical aberration that…have become necessary" makes the first example *Step 1A Counter-claiming*, whereas the expression "in a significant amount of spherical aberrations …" makes the second example *Step 1B Indicating gap*.

- ***Step 1A (Counter-claim)***
  However, the use of ... results in such a degree of spherical aberration that radical design changes are necessary.
- ***Step 1B (Gap)***
  However, the use of ... results in a significant amount of spherical aberrations ...
- ***Step 1C (Question)***
  However, it is not clear whether the use of ... can be modified to reduce spherical aberration to acceptable levels.
- ***Step 1D (Continuation)***
  The remaining issue is to find a way of better controlling spherical aberration.

The last move, *Move 3 Occupying the niche,* represents a researcher's commitment and accomplishments. This move consists of three steps: *Step 1A Outlining purposes, Step 1B Announcing present research, Step 2 Announcing present findings*, and *Step 3 Indicating RA structure.* In Step 1A, researchers indicate their main purposes. In Step 1B, researchers describe the main features of their research. Step 2 reports principal findings from the research. Step 3 indicates the research article structure. Below are examples of steps in *Move 3* given by Swales (1990, p.160-162).

- ***Step 1A Outlining purposes***
  The aim of the present paper is to give ...
- ***Step 1B Announcing present research***
  This paper utilizes the notion of ...
- ***Step 2 Announcing present findings***
  The changes that ... show a skilled novice learning ...
- ***Step 3 Indicating RA structure***
  We have organized the rest of this paper in the following way ...

From Figure 2.1, in *Move 1 Establishing a territory*, the rhetorical effort, using modifying words to show importance, declines from *Step 1 Claiming centrality* to *Step 2 Making topic generalization(s)*, and the rhetorical effort is the least in *Step 3 Reviewing items of previous research*. For *Move 2 Establishing a niche,* the author attempt to weaken knowledge claims of previous studies. In *Move 3 Occupying the*

niche, the description of the present research is increasingly explicit. Swales's 1990 CARS model shows moves and steps in a preferred sequence found in article introductions. They are usually, but not always, in the proposed order.

- **Swales's 2004 revised CARS model**

There are several studies following Swales's move analysis, but some of them showed different move-step patterns. Based on several studies and informants, Swales proposed a revised model in 2004 as shown in Figure 2.1.

There are some differences between the 1990 and 2004 models. First, in *Move 1 Establishing a territory*, there is only one step, *Topic generalizations of increasing specificity*. Both *Step 1 Claiming centrality* and *Step 3 Reviewing items of previous research* of 1990 model were removed because some scholars claim that *Claiming centrality* is difficult to identify and distinguish from *Topic generalization*, and referring to previous research often occurs throughout the Introduction section, and is not specific to this move.

Second, the direction of moves may not be linear, *Move 1* → *Move 2* → *Move* 3, but recycling can occur. For example, *Move 1* → *Move 2* → *Move 1* → *Move 2* may occur as shown in Figure 2.1. Several rounds of recycling are possible with increasing specificity of the topic.

Third, in *Move 2 Establishing a niche, Step 1A Counter-claiming, Step 1C Question-raising,* and *Step 1D continuing a tradition* of the 1990 model were removed. Moreover, *Step 1B Indicating gap* in the 1990 model was changed to *Step 1A Indicating gap* in the 2004 model. Furthermore, *Step 1B Adding to what is known* and *Step 2 Presenting positive justification* were added to the 2004 model.

Furthermore, the label for *Move 3* was changed from *"Occupying the niche*" to *"Presenting the present work"* because the new label describes the contents of this move better than the old one. Additionally, several steps in *Move 3 Presenting the present work* were added as they were found in other move analysis studies, so there are seven steps in *Move 3* of the 2004 model. These steps include *Step 1 Announcing present research descriptively and/or purposively* (combination of *Step 1A Outlining purposes* and *Step 1B Announcing present research* of the 1990 model), *Step 2*

Presenting research questions or hypotheses, Step 3 Definitional clarifications, Step 4 Summarizing methods, Step 5 Announcing principal outcomes, Step 6 Stating the values of the present research, and *Step 7 Outlining the structure of the paper*. Only *Step 1 Announcing present research descriptively and/or purposively* is an obligatory step. Other steps are optional.

2.3.3.2 Nwogu's move analysis model

Another relevant move analysis study is Nwogu's model (1997). Nwogu (1997) analyzed 30 research articles chosen from five peer-reviewed journals and proposed the move analysis model for the entire medical research article: Introduction, Methods, Results, and Discussion, as shown in Figure 2.3. While some move analysis studies describe only the structure of the research articles, Nwogu (1997) provides detailed description of linguistic features in that structure. Thus, up to now, Nwogu's model has remained the most comprehensive move analysis of English medical research articles (Sayfouri, 2010).

To identify moves and steps, the analytical framework of Nwogu's move analysis was based on Swales's 1981 and 1990 models, but there are some adaptations, such as giving clearer and more unambiguous move labels. This can be seen by comparison with move labels in Swales's model in Table 2.2.

In the Introduction section, Nwogu (1997) identified three moves: *Move 1 Presenting background information, Move 2 Reviewing related research,* and *Move 3 Presenting new research*. Move 1 and Move 3 in Nwogu's (1997) study are equivalent to those in Swales's (1990) study as shown in Table 2.2. Move labels in Swales's model are metaphorical, whereas those in Nwogu's model are objective. Later, Swales (2004) changed *Move 3*'s label to *Presenting the present work,* similar to *Move 3* in Nwogu's (1997) model. The comparison of both moves and steps between Swales's 1990 model and Nwogu's 1997 model can be seen in Figure 2.4.

Introduction

Move 1: Presenting Background Information:
by (1) Reference to established knowledge in the field.
(2) Reference to main research problems.
Move 2: Reviewing Related Research:
by (1) Reference to previous research.
(2) Reference to limitations of previous research.
Move 3: Presenting New Research:
by (1) Reference to research purpose.
(2) Reference to main research procedure.

Methods

Move 4: Describing Data-collection Procedure:
by (1) Indicating source of data.
(2) Indicating data size.
(3) Indicating criteria for data collection research.
Move 5: Describing Experimental Procedures:
by (1) Identification of main research apparatus.
(2) Recounting experimental process.
(3) Indicating criteria for success.
Move 6: Describing Data Analysis Procedures:
by (1) Defining terminologies.
(2) Indicating process of data classification.
(3) Identifying analytical instrument/procedure.
(4) Indicating modification to instrument/procedure.

Results

Move 7: Indicating Consistent Observation:
by (1) Highlighting overall observation.
(2) Indicating specific observations.
(3) Accounting for observations made.
Move 8: Indicating Non-Consistent Observations:

Discussion

Move 9: Highlighting Overall Research Outcome:
Move 10: Explaining Specific Research Outcomes:
by (1) Stating a specific outcome.
(2) Interpreting the outcome.
(3) Indicating significance of the outcome.
(4) Contrasting present and previous outcomes.
(5) Indicating limitations of outcomes.
Move 11: Stating Research Conclusions:
by (1) Indicating research implications.
(2) Promoting further research.

Figure 2.3 Nwogu's 1997 model for medical research articles

Table 2.2 Comparison of move labels between Swales's 1990 model and Nwogu's 1997 model

Move	Swales's 1990 model	Nwogu's 1997 model
Move 1	*Establishing a territory*	*Presenting background information*
Move 2	*Establishing a niche*	*Reviewing related research*
Move 3	*Occupying the niche*	*Presenting new research*

Move/Step	Swales 1990	Nwogu 1997	Swales 2004	Kanoksilapatham 2005	Kanoksilapatham 2007
Move 1	**Establishing a territory**	**Presenting Background Information**	**Establishing a Territory** (citations required)	**Announcing the Importance of the Field**	**Announcing the Importance of the Field**
○ Step 1	Claiming centrality	Reference to established knowledge in the field	Topic generalizations of increasing specificity	Claiming the centrality of the topic	
○ Step 2	Making topic generalization(s)	Reference to main research problems		Making topic generalizations	
○ Step 3	Reviewing items of previous research			Reviewing previous research	
Move 2	**Establishing a Niche**	**Reviewing Related Research**	**Establishing a Niche** (citations possible)	**Preparing for the Present Study**	**Preparing for the Present Study**
○ Step 1	Step 1A: Counter-claiming	Reference to previous research	Step 1A: Indicating a gap	Indicating a gap	
	Step 1B:Indicating a gap		Step 1B: Adding to what is known		
	Step 1C:Question-raising				
	Step 1D:Continuing a tradition				
○ Step 2		Reference to limitations of previous research	Presenting positive justification	Raising a question	
Move 3	**Occupying the niche**	**Presenting New Research**	**Presenting the Present Work** (citations possible)	**Introducing the Present Study**	**Introducing the Present Study**
○ Step 1	Step 1A: Outlining purposes	Reference to research purpose	Announcing present research descriptively and/or purposively	Stating purpose(s)	Stating objectives
	Step 1B:Announcing present research				
○ Step 2	Announcing principle findings	Reference to main research procedure	Presenting research questions or hypotheses	Describing procedure	Detailing procedures
○ Step 3	Indicating RA structure		Definitional clarifications	Presenting findings	Justifying decisions made
○ Step 4			Summarizing methods		Stating implications
○ Step 5			Announcing principal outcomes		
○ Step 6			Stating the value of the present research		
○ Step 7			Outlining the structure of the paper		

Figure 2.4 Comparison of move models of research article introductions

Interestingly, *Move 2 Reviewing related research* is different from *Move 2 Establishing a niche*. In Swales's 1990 CARS model, *Reviewing items of previous research* is just *Step 3* of *Move 1*. This is an interesting point because one of the changes in Swales's 2004 revised CARS model is removing *Step 3 Reviewing items of previous research* and stating that referring to previous studies is a characteristic of *Move 1* and Move *2*. In *Move 1*, citations are required, but they are possible in *Move 2* (See Figure 2.1).

There are also other differences regarding steps. In *Move 1 Presenting background information*, there are two steps: *Step 1 Reference to established knowledge in the field*

and *Step 2 Reference to main research problems.* Step labels of *Move 1* in this model are slightly different from those of Swales's 1990 model. *Step 1 Reference to established knowledge in the field* in Nwogu's model is equivalent to *Step 2 Making topic generalization(s)*in Swales's 1990 model, and *Step 2 Reference to main research problems* in Nwogu's model is comparable to *Step 1 Claiming centrality* in Swales's 1990 model.

In *Move 2 Reviewing related research*, two steps are identified: *Step 1 Reference to previous research* and *Step 2 Reference to limitations of previous research.* In *Step 1,* authors refer to previous studies, in any aspect, but *Step 2* focuses on limitations of previous research. Nwogu (1997) states that *Step 2* can be identified by negative evaluation of previous research and indicating a gap in previous research (See examples below). The key words for identification are underlined.

- **Negative evaluation of previous research**
  Some studies have failed to find such associations or have found small differences that are not significant.
- **Indicating a gap in previous research**
  However, the possible prevention of PIH and pre-eclampsia in primigravidae by suppression of platelet TXA2 production with low dose.

In the last move of the Introduction section, *Move 3 Presenting new research* consists of two steps: *Step 1 Reference to research purpose* and *Step 2 Reference to main research procedure. Step 1 Reference to research purpose* in Nwogu's model is equivalent to *Step 1A Outlining purposes* in Swales's 1990 model. However, *Step 2 Reference to main research procedure* is not identified in any steps of Swales's CARS model. Moreover, *Step 1B Announcing present research, Step 2 Announcing present findings,* and *Step 3 Indicating RA structure* of *Move 3* in Swales's 1990 model do not exist in that of Nwogu's 1997 model.

The differences in moves and steps between the two models may be due to different disciplines of research article: science and medicine. Each discourse community has different characteristics, so the rhetorical structures of their genres may differ. Therefore, besides using Swales's models (1990 and 2004), Nwogu's 1997 model was also used in this study, as the genre of this study is medical research articles.

2.3.3.3 Kanoksilapatham's move analysis models

As this research aims to investigate moves and steps of English medical research article introductions in a Thai medical journal corpus and an international medical journal corpus and compare the results between these corpora, issues regarding Thai culture and Thai language should be studied because they may affect the results of the analysis. Thus, contrastive move analysis studies relating to Thai language or the Thai scientific discourse community should be reviewed. Kanoksilapatham (2005, 2007) proposed two move analysis models of biochemistry research articles. The 2005 and 2007 models represent moves and steps in English biochemistry research articles and Thai biochemistry research articles, respectively. These models are explained below. Their moves and steps are compared with other models in Figure 2.4.

- **Kanoksilapatham's 2005 model**

Kanoksilapatham (2005) analysed 60 biochemistry research articles using Swales's 1990 model. The cut-off frequency of 60% of occurrence was used to indicate conventional and optional moves. If a move occurs in 60% of the corpus, it will be considered as a conventional or obligatory move. Based on this cut-off frequency, all moves in the Introduction section are conventional. There are three moves identified: *Move 1 Announcing the importance of the field, Move 2 Preparing for the present study,* and *Move 3 Introducing the present study.* Like those of Nwogu's 1997 model, these move labels are clear and objective, different from an ecological metaphor in Swales's 1990 CARS model. For step labels, some steps in Kanoksilapatham's 2005 model are equivalent to those of Swales's 1990 model and some are comparable to those of Nwogu's 1997 model.

In *Move 1 Announcing the Importance of the Field*, there are three steps: *Step 1 Claiming the centrality of the topic, Step 2 Making topic generalizations,* and *Step 3 Reviewing previous research.* These steps are the same as those in Swales's 1990 model.

Move 2 Preparing for the Present Study consists of two steps: *Step 1 Indicating a gap* and *Step 2 Raising a question*. *Step 1 Indicating a gap* in Kanoksilapatham's 2005 model is equivalent to *Step 1B Indicating gap* in Swales's 1990 model, and *Step 2*

Raising a question in Kanoksilapatham's 2005 model is comparable to *Step 1C Question-raising* in Swales's 1990 model.

In *Move 3 Introducing the Present Study,* there are three steps: *Step 1 Stating purpose(s), Step 2 Describing procedure,* and *Step 3 Presenting findings*. *Step 1 Stating purpose(s)*in Kanoksilapatham's 2005 model is equivalent to *Step 1A Outlining purposes* in Swales's 1990 model. *Step 2 Describing procedure* in Kanoksilapatham's 2005 model is comparable to *Step 2 Reference to main research procedure* in Nwogu's 1997 model. *Step 3 Presenting findings* in Kanoksilapatham's 2005 model is equivalent to *Step 2 Announcing present findings* in Swales's 1990 model.

- **Kanoksilapatham's 2007 model**

Unlike Kanoksilapatham's 2005 study, Kanoksilapatham's 2007 move analysis was based on Swales's 2004 revised CARS model. Sixty biochemistry research articles written in Thai were analysed, and three moves were identified in the Introduction section. These moves are *Move 1 Announcing the importance of the field, Move 2 Preparing for the present study,* and *Move 3 Introducing the present study,* the same as Kanoksilapatham's 2005 model.

Kanoksilapatham (2007) states that *Move 1 Announcing the importance of the field* can be relatively general or specific as shown in the examples below ("R" in brackets indicates citation.). Unlike previous models, there is no step in *Move 1* of Kanoksilapatham's 2007 model. Kanoksilapatham (2007) also notes that there is cyclical patterning of *Move 1Announcing the importance of the field* and *Move 2 Preparing for the present study.* These findings may be influenced by Swales's 2004 revised CARS model, in which Swales removes other steps in the 1990 model and proposes only one step, *Topic generalizations of increasing specificity*. Swales also suggests that there is possible recycling of increasingly specific topics. The general and specific introductions of the topic are the characteristics of *Move 1,* but these may not be considered as steps in Kanoksilapatham's 2007 study. Thus, there is no step in this move.

- ***Move 1 Announcing the importance of the field* (general)**
  The ovaries of prepuberal native-Thai calves consist of a considerable number of primordial germ cells (R).

- ***Move 1 Announcing the importance of the field*** **(specific)**
  Siamese crocodiles, under the scientific name of Crocodylussaimensis, belong to the class Reptilia, order Crododilia, family Crocodylicade, and subfamily Crododylinae (R). They can be found in most areas of Thailand, with the exception of the south.

In *Move 2 Preparing for the present study*, Kanoksilapatham (2007) does not identify any steps. She states that the strategy used in this move is addressing gaps in previous research. As there is only one strategy, indicating gaps in this model is considered as a strategy, not a step, because there is no alternative to the strategy. This feature may be specific to biochemistry research articles because it differs from *Move 2* of Swales's 2004 model which consists of three steps: *Step 1A Indicating gap*, *Step 1B Adding to what is known* and *Step 2 Presenting positive justification*.

Move 3 Introducing the present study consists of four steps: *Step 1 Stating objectives, Step 2 Detailing procedures, Step 3 Justifying decisions made*, and *Step 4 Stating implications*. Examples of these steps are shown below. There are four steps in Kanoksilapatham's (2007) model, but there are seven steps in Swales's 2004 model. This may result from the different disciplines of the respective corpora, so some details are not mentioned in biochemistry research articles.

- ***Step 1 Stating objectives***
  The objective of this study is to examine relationships among cancer types.
- ***Step 2 Detailing procedures***
  … by comparing the tissues that are pathologenic to non-pathologenic tissues.
- ***Step 3 Justifying decisions made***
  (… by using RT-PCR). This technique was reported to be highly sensitive, specific, and applicable to clinical use.
- ***Step 4 Stating implications***
  The detection of aflatoxin B1 contamination in medicinal plant materials will be useful for the avoidance of consuming medicinal plants contaminated with aflatoxin B1.

Kanoksilapatham (2007) compared move analysis results of English biochemistry research articles (2005 model) and those of Thai biochemistry research articles (2007 model) and found two interesting issues. First, in *Move 3 Introducing the present study, Step 3 Presenting findings* occurs only in the English biochemistry corpus (2005 model). This is due to the highly competitive nature of the scientific community, especially in America and other Western countries. Researchers need to highlight findings in the Introduction section to express their contribution to the field as immediately as possible (Kanoksilapatham, 2007). Second, *Step 3 Justifying decisions made* and *Step 4 Stating implications* occur only in the Thai biochemistry corpus (2007 model). This may result from the research situation in Thailand that is more likely to promote applied research than basic research, so Thai biochemists have to claim values of their studies that meet the terms of the national policy (Kanoksilapatham, 2007). However, all three moves in both models are obligatory, with the cut-off frequency of 60%.

2.3.3.4 Comparison of move analysis models

During the preliminary study, it was found that there were some texts that could not be identified by using only one of Swales's (1990 and 2004) models, the most-mentioned models, and Nwogu's medical research article model. Also, the combination of these three models could not describe all the text segments in the medical research articles. Thus, two models from Kanoksilapatham's studies (2005 and 2007), which investigated biochemistry journals, were included in this study because biochemistry is regarded as a branch of medicine. Using the moves and steps from these five models provides a variety of steps to be used in the development of an analytical framework. The comparison of these five models is shown in Figure 2.4. Some modifications have been made, resulting in the analytical framework for coding (see Chapter 3).

2.3.4 Contrastive move analysis studies

Due to the importance of English language both in local and global contexts, many move analysis studies have been carried out to explore English language used in different English varieties, various situations and by various groups of users. The results from these studies are interesting.

First, in Thaweewong's genre analysis (2006), both national and corporate cultures play a crucial role in English business e-mail correspondence. However, English business e-mail messages written by Thais were influenced by corporate culture more than those written by Germans. Second, Yanatchapim (2011) compared thesis abstracts in linguistics written by students in Thailand and students in England, and found that although moves employed by both groups are similar, the steps differ to some degree. Thai students tend to omit *"Move 1 Background"*, follow the conventional sequence of moves, and emphasize *"Move 4 Results"* and *"Move 3 Methodology"*, while students in England do not omit Move 1, repeat moves in their abstracts, and emphasize *"Move 4 Results"* and *"Move 2 Presenting the Research"*.

Moreover, some studies comparing research articles introductions written in English and other languages have found that different rhetorical structures relate to different cultures. A comparative study conducted by Im-o-cha (2004) shows that introductions written in Thai differ from those written in English in terms of move-ordering patterns, even though all three moves as described in Swales' CARS model appeared in both corpora. Loi and Evans (2010) compared the organization of introductions of English L1 and Chinese L1 research articles in the field of educational psychology. Some steps, such as indicating a gap and claiming the significance of the study, were employed less in Chinese introductions. They concluded that the less-frequent use of some steps may reflect the influence of social conventions of Chinese societies and Confucian teaching.

Similarly, Sheldon (2011) investigated research article introductions written by English L1, English L2, and Spanish L1 writers. As expected, moves and steps of English L1 texts are similar to Swales's CARS (2004) model, and moves and steps of Spanish L1 texts somewhat reflect a culture-specific writing style. For the English L2 group, there is a combination of academic English culture and native language norms.

According to the above research, the culture of language users has been shown to influence the use of English. As each genre has different cultural expectations, a writer must consider these issues and relearn the genre within that particular group to produce the appropriate written work (Connor, Precht, and Upton, 2002).

Like other non-native English countries, Thailand has more medical publications in English than in the past. However, several studies show that Thais face difficulties in

using English. To help medical researchers understand acceptable structures of target journals they plan to submit their work to, this study aims to investigate the rhetorical organization of research article introductions in local (Thai) medical journals and international medical journals.

2.4 Medical research articles

2.4.1 The structure of medical research articles

A medical research article typically consists of four sections: Introduction, Methods, Results, and Discussion. The structure is called IMRD. This standard IMRD structure was established by the American National Standards Institute in 1972 to solve problems in the editorial process relating to the lack of standards in article headings (Lang, 2009, p.7).

Previously, there was no rigid macro structure of research articles headings used in published articles, and they varied a lot. The headings during that time included "argument", "published results", "experiments", "techniques", "reaction", "response", "progress", "history", "physical signs", "effects", "investigation", and "cases". Using these headings, Introduction, Methods, Results, and Discussion, helps both authors and editors have the same set of expected article format. By the late 1970s, this format had become the dominant format for research papers in a majority of leading scientific journals worldwide (Wu, 2011, p.1346). *The Journal of Clinical Reasoning & Procedural Competency Articles* states that, "Articles are to follow the IMRC/IMRD structured format for educational development and research. As this regular convention is helpful for the author to organize ideas and for the editor and reviewer to evaluate the manuscript, this convention has been widely used until now" (Wu, 2011, p.1347).

The *International Committee of Medical Journal Editors* (ICMJE, 2013) developed "Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals". These recommendations are generally used by writers, editors, and others related to peer review and biomedical publication to contribute accurate, clear, and unbiased medical journal articles. The details of recommendations for manuscripts sections are in Appendix A.

However, English research articles do not always follow this IMRD format. According to a study by Rakhmawati (2013), the majority of English research articles published in Indonesian accredited journals is in IMRD+C format. C refers to the Conclusion section that is accompanied by the Suggestion section written explicitly as the final sub-heading section. This macrostructure variation results from the high expectations of the Indonesian discourse community that authors must provide recommendations for all research findings as direct solutions for an identified problem in their community.

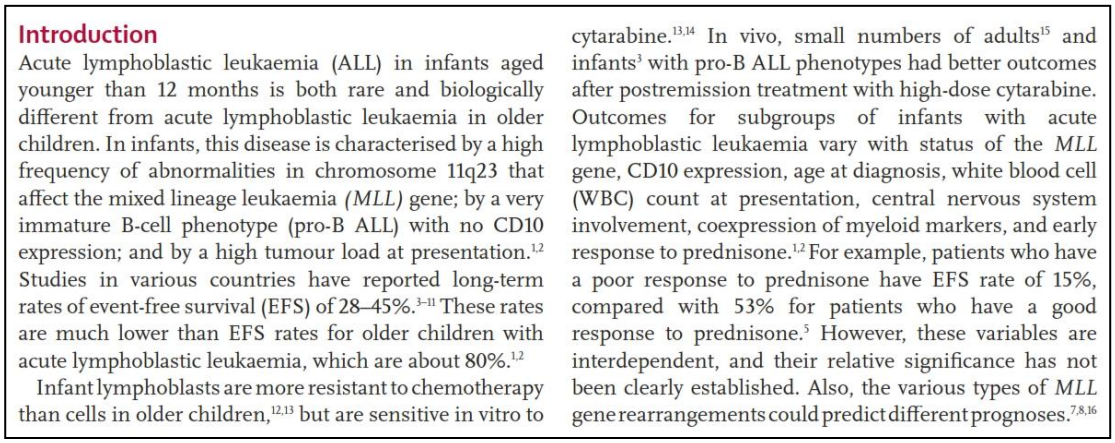
The four main sections may also be in another order. For example, research articles in the Journal of Clinical Investigation are in IRDM (Introduction, Results, Discussion, and Methods) format. This pattern might be due to the journal's policy. Although there are variations in macrostructure of research articles, the majority of English research articles are in IMRD format (Wu, 2011, p.1346).

2.4.2 Four sections in IMRD structure

With the standardized IMRD format, a medical research article consists of four sections.

First, the Introduction section [I] generally provides the background information, the rationale, the need for the study, and the aim of the study (Vintzileos and Ananth, 2010, p.344). To set the scene of the study, citations are frequently used in this section, both citation numbers at the end of a sentence and in-text citations. Citations are found in almost all sentences. This can be seen from an excerpt (Introduction no. I3) of the international corpus in this study (See Figure 2.5).This section should not include data or conclusions from the work being reported (ICMJE, 2013). Although this section is usually referred to as the "Introduction", other headings may be used, depending on the journals. For example, *The New England Journal of Medicine* and *Srinagarind Medical Journal* use the heading "Background".

The second section is the Methods [M]. It includes descriptions of study design, and measurement parameters used to assess the aim of the study (Manske, 2007, p.111). This section may be called "Materials and methods" as in the *Songklanagarind Medical Journal* and *Thammasat Medical Journal*.



Introduction

Acute lymphoblastic leukaemia (ALL) in infants aged younger than 12 months is both rare and biologically different from acute lymphoblastic leukaemia in older children. In infants, this disease is characterised by a high frequency of abnormalities in chromosome 11q23 that affect the mixed lineage leukaemia *(MLL)* gene; by a very immature B-cell phenotype (pro-B ALL) with no CD10 expression; and by a high tumour load at presentation.[1,2] Studies in various countries have reported long-term rates of event-free survival (EFS) of 28–45%.[3–11] These rates are much lower than EFS rates for older children with acute lymphoblastic leukaemia, which are about 80%.[1,2]

Infant lymphoblasts are more resistant to chemotherapy than cells in older children,[12,13] but are sensitive in vitro to cytarabine.[13,14] In vivo, small numbers of adults[15] and infants[3] with pro-B ALL phenotypes had better outcomes after postremission treatment with high-dose cytarabine. Outcomes for subgroups of infants with acute lymphoblastic leukaemia vary with status of the *MLL* gene, CD10 expression, age at diagnosis, white blood cell (WBC) count at presentation, central nervous system involvement, coexpression of myeloid markers, and early response to prednisone.[1,2] For example, patients who have a poor response to prednisone have EFS rate of 15%, compared with 53% for patients who have a good response to prednisone.[5] However, these variables are interdependent, and their relative significance has not been clearly established. Also, the various types of *MLL* gene rearrangements could predict different prognoses.[7,8,16]

Figure 2.5 Example of introduction using number citations at the end of sentences

Third, the Results section [R] presents the collected data (Manske, 2007, p.111). The results should be presented in logical sequence, and the most important findings should be presented first (ICJME, 2013). This part often includes tables and figures.

The final section is the Discussion [D]. In this part, the authors should give a summary of the study and the principal findings, interpret the results, and explain their implications (Lang, 2009, p.161-162). The conclusions should be linked with the aims of the study. The authors should not repeat in detail information given in the Introduction or the Results section (ICMJE, 2013).

2.4.3 Related medical research article studies

Besides Nwogu's (1997) study, move analysis has also been used by several other scholars to analyze medical research articles, and the results of their studies are of interest.

In 2006, Li and Ge compiled two corpora: 25 medical research articles published between 1985 and 1989 (Corpus A) and 25 medical research articles published between 2000 and 2004 (Corpus B). They analyzed the frequency of occurrence of the 11 moves from Nwogu's (1997) study and found that time had an effect on the structure of medical research articles. A cut-off frequency of 50% was used to classify moves into "obligatory" and "optional". Their study demonstrated that *Move 1 Presenting background information* and *Move 6 Describing data-analysis procedure* changed from being "optional" to "obligatory", while *Move 9 Highlighting overall research outcome* changed from "obligatory" to "optional". The findings indicate that today's medical

writers are more likely to provide background information and describe the data-analysis procedures.

Another study was conducted by ElMalik and Nesi (2008). They compared moves and steps in research articles written by British and Sudanese medical researchers. Ten research articles by British writers and 10 research articles by Sudanese writers were analyzed. There is one step that was not identified in Nwogu's (1997) study. In *Move 4 Describing data collection,* an additional step, *"Notification of ethical clearance"*, was found in about half of their corpora (40% in British and 50% in Sudanese). This step mentions ethical clearance issues as shown in the example below.

> *The research team first visited Marbata village in April 2001, after approval for the study was given by the federal and state health authorities and ethical clearance was obtained from the Institutional Review Board of the Faculty of Medicine at Khartoum University. Informed consent for the research was obtained from the village People's Committee and the local community leader (Sheikh), as well as from all individuals who participated in the study.*

All introductions in both corpora contained *Move 3 Presenting new research*, but this move was identified slightly differently by the British and Sudanese researchers. The British writers were likely to be less specific about the main research procedure, and some used *Move 3* to positively evaluate their research, whereas the Sudanese writers tended to express research purpose and procedure more succinctly and objectively, as shown in the examples below.

> *We investigated in a large open population with a long term follow-up period which easily measurable factors will best identify patients at high risk of progression of osteoarthritis of the hip.*

Sayfouri (2010) compared moves and steps of research articles from ISI English-American (E-A), ISI Iranian, and non-ISI Iranian medical journals by using Nwogu's (1997) model. The analysis illustrated that the two groups of Iranian articles used significantly fewer numbers of *Step 1.2 Reference to main research problem* of *Move 1*, *Step 2.2 Reference to limitations of previous research* of *Move 2*, and *Step 3.2*

Reference to main research procedures of *Move 3* in their Introduction sections, compared to E-A articles. Sayfouri commented that Iranian researchers failed to present adequate types of information in their Introduction sections.

2.5 Summary

This chapter has reviewed literature relating to the corpus-based approach, genre analysis, move analysis, and medical research articles. The next chapter will explain how this research was prepared and conducted.

CHAPTER 3 RESEARCH METHODOLOGY

This chapter provides details about the corpora, the analytical framework, and research procedures. The purpose of this study is to answer the following research questions:

RQ1 What are the moves and steps of the Introduction section in English medical research articles published in Thai medical journals?

RQ2 What are the moves and steps of the Introduction section in English medical research articles published in international medical journals?

RQ3 What are the similarities and differences in the moves and steps between English medical research article introductions published in Thai medical journals and international medical journals?

The contents are divided into four sections as follows:

3.1 The corpora
3.2 The analytical framework
3.3 Research procedures
3.4 Summary

3.1 The Corpora

3.1.1 Thai and international medical journal corpora

As this study aims to identify moves and steps of introductions of English medical research articles in Thai medical journals and international medical journals, it is crucial to create two comparable, specialised corpora as data for this move analysis. The first corpus was compiled from English medical research article introductions in Thai medical journals, and the second corpus was compiled from English medical research article introductions in international medical journals. In this study, the first corpus is referred to as Thai medical journal corpus, and the second corpus is referred to as international medical journal corpus for conciseness. These short titles of the corpora represent the sources of the research article introductions used in this research.

As stated in Chapter 2, four aspects of corpora design are taken into consideration to ensure that the corpora are reliable and adequately representative of introductions in research articles of medical journals at both national and international levels. Below are the description of the two corpora used in this study in terms of size, content, balance and representativeness of the corpora.

3.1.2 Size of corpora

As mentioned in Chapter 2, the size of a corpus refers to the total number of words of the corpus, the number of texts from different categories, the number of samples from each text, and the number of words in each sample. This information is described below.

The Thai medical journal corpus consists of 8,609 words. There are 25 English medical research article introductions from five Thai medical journals. The average number of words in an introduction is 344.36 words. The average number of sentences in an introduction is 15.44 sentences, and the average number of paragraphs in an introduction is 2.76 paragraphs (See Table 3.1).

Table 3.1 Characteristics of the Thai medical journal corpus

	Total (whole corpus)	**Mean (per introduction)**	**Minimum-maximum**
Word	8,609	344.36	253-558
Sentence	386	15.44	9-28
Paragraph	69	2.76	1-5

The international medical journal corpus consists of 9,765 words, so the total number of words in the corpora used in this study is 18,374. The international corpus was compiled from 25 English medical research article introductions from five international medical journals. The average number of words in an introduction is 387.00 words. The average number of sentences in an introduction is 15.00 sentences, and the average number of paragraphs in an introduction is 3.52 paragraphs (See Table 3.2).

Table 3.2 Characteristics of the international medical journal corpus

	Total (whole corpus)	**Mean (per introduction)**	**Minimum-maximum (per introduction)**
Word	9,675	387.00	269-586
Sentence	375	15.00	10-24
Paragraph	88	3.52	2-6

3.1.3 Content of corpora

As the field of medicine covers a wide range of branches, the content of a medical research article can be in any categories ranging from molecular medicine to subspecialties. Examples of medical branches include pharmacology, toxicology, microbiology, biochemistry, medical education, surgery, internal medicine and pediatrics. Thus, the corpora in this study included introductions of research articles related to medicine. The titles of medical research articles included in this study can be seen in Appendix C.

For instance, the research article titled *"Effects of rifampicin and ketoconazole on the pharmacokinetics of a single oral dose of diethylcarbamazine in healthy volunteers"* represents a pharmacological study (a study of a drug and its action). The articles titled *"Acute illnesses associated with pesticide exposure at schools"* and *"Prevalence and risk factors of Lithium toxicity at Srinagarind Hospital"* are under the branch of toxicology.

However, some studies may involve two or more branches of medicine because of several aspects of the study and the multidisciplinary nature of medical research. For example, the article titled *"Antibiotic treatment of Chlamydia pneumoniae after acute coronary syndrome"* is under the branches of microbiology and cardiology. Also, the article titled *"Risk of herpes zoster in patients with rheumatoid arthritis treated with anti-TNF-α agents"* presents the results of a study related to a combination of microbiology, rheumatology, and immunology.

3.1.4 Balance of corpora

According to McEnery, Xiao, and Tono (2006), a balanced corpus includes a compilation of a broad range of text types which are considered representative of the language or language variety of the study. As this study focuses on the medical research article genre, a balanced corpora is achieved by choosing a variety of introductions in several branches from representative medical research journals (see 3.1.5) in equal numbers. In other words, in each corpus, five articles were selected from each representative journal, so that the total number of articles used is 25. However, due to limited English research articles published in Thai journals, only four research article introductions fulfilling all criteria could be found in the *Songklanagarind Medical Journal*, so six research article introductions were selected from the *Thai Journal of Health Research* instead, together with five research article introductions from each of the other three journals, to achieve the expected number of introductions.

3.1.5 Representativeness of corpora

3.1.5.1 Selection of the journals

Representativeness is a crucial factor in corpora compilation. As the scope of this study is the medical research genre, Nwogu's (1997) criteria for selecting medical research articles were used. His criteria include representativity, reputation, and accessibility. The first criterion, representativity, means that the chosen journals represent the language used by members of the medical profession. Reputation, the second criterion, refers to the respect which members of this discourse community hold for a particular publication due to its value. The last one, accessibility, means that the selected texts can be easily obtained.

For the Thai medical journal corpus, the lists of approved international and national journals by the Commission on Higher Education (CHE), Thailand, suggestion from an expert in medicine and research, and the researcher's background knowledge in medical field were used to select the journals fulfilling Nwogu's criteria.

First, medical journals published in Thailand were searched and listed. Next, this list was presented to medical and research experts for comment. Then, the journals that were in the lists of approved international journals by the Commission on Higher Education (CHE), Thailand, were removed as they were regarded as international

journals. Only medical journals appearing in the national journals by the Commission on Higher Education (CHE), Thailand, remained.

After that, the journals were searched for English research articles from both online and printed versions depending on each journal's availability. The five refereed medical journals passing the above process were selected in this study. These journals consist of the *Thai Journal of Health Research*, *Thai Journal of Hematology and Transfusion Medicine*, *Thammasat Medical Journal*, *Srinagarind Medical Journal*, and *Songklanagarind Medical Journal*.

These journals are owned by well-known medical organizations of Thailand. The first journal, the *Thai Journal of Health Research*, is published by the College of Public Health Sciences, Chulalongkorn University. The *Thai Journal of Hematology and Transfusion Medicine* is owned by the National Blood Centre, Thai Red Cross Society, and the Thai Society of Hematology. The last three journals are from Thai medical schools: the *Thammasat Medical Journal* published by the Faculty of Medicine, Thammasat University, the *Srinagarind Medical Journal* published by the Faculty of Medicine, Khon Kaen University, and the *Songklanagarind Medical Journal* published by the Faculty of Medicine, Prince of Songkla University.

Table 3.3 Journal impact factors of journals in the Thai medical journal corpus

Journal Title	**Thai Journal Impact Factor (TCI Centre, 2012)**
Thai Journal of Health Research	0.222
Thai Journal of Hematology and Transfusion Medicine	0.108
Thammasat Medical Journal	0.098
Srinagarind Medical Journal	0.097
Songklanagarind Medical Journal	0.061

As these journals are at the national level, the Thai journal impact factors of the Thai-Journal Citation Index (TCI) Centre are presented instead of the journal impact factor of the ISI Web of Science. The journal impact factors of these journals are shown in Table 3.3.

For the international medical journal corpus, the five refereed medical journals include *The New England Journal of Medicine*, *The Lancet*, *The Journal of the American Medical Association*, *The British Medical Journal*, and *The Journal of Clinical Investigation*. This list is the same as that of previous studies (Nwogu, 1997; Li and Ge, 2009) because these journals fulfil the three criteria mentioned above, and the data from this study can be compared with the previous data as they are from the same source journals. These journals publish manuscripts from medical researchers worldwide, have high impact factors, and provide online access together with printed versions, so this guarantees their representativity, reputation, and accessibility. The journal impact factors of these journals are shown in Table 3.4.

Table 3.4 Journal impact factors of journals in the international medical journal corpus

Journal Title	**Journal Impact Factor (ISI Web of Science, 2012)**
The New England Journal of Medicine	51.658
The Lancet	39.060
The Journal of the American Medical Association	29.978
The British Medical Journal	17.215
The Journal of Clinical Investigation	12.812

3.1.5.2 Selection of medical research articles

After the journals were listed, the medical research articles were screened for the following criteria. The first criterion is that the research article must be written in English. Second, the type of research article must be an original research article with IMRD (Introduction, Methods, Results and Discussion) structure. Next, the content of a research article can be in any category ranging from molecular medicine to subspecialties as stated in 3.1.3. Finally, the research articles must have been published during 2005-2009. This time period was set to obtain the most up-to-date and complete introductions at the time of data collection. A list of the articles in both corpora is shown in Appendix C.

3.1.5.3 Selection of the medical research article introductions

The last step of the selection process is selection of the medical research article introductions. To reduce the effects of extremely short and long texts on the analysis, the length of the Introduction section must be in the range of 250-600 words. Moreover, the number of paragraphs in the Introduction section must not exceed six paragraphs. Furthermore, the author profiles were not used as exclusion or inclusion criteria as this research focuses on move and step patterns found in the international medical journals and the national medical journals, not the authors.

3.2 The Analytical Framework

3.2.1 Developing the analytical framework

In developing the analytical framework, there were four steps. First, the moves and steps identified from previous move analysis models, Swales's (1990 and 2004) move analysis models, Nwogu's (1997) model and Kanoksilapatham's (2005 and 2007) models, were compiled. Second, the moves and steps from each previous model were used to analyze a few text samples. It was found that the moves and steps from only one previous model could not identify the entire sample, so the researchers decided to combine moves and steps from several models. Suggestions from the inter-rater and discussion among the researchers were used to develop a new framework. Third, the modified analytical framework was used in the same samples and revised until the researchers and inter-rater agreed with the analysis results. Finally, the tentative analytical framework and its description were proposed and used in the study. The previous analytical frameworks before obtaining the final framework are shown in Figure 3.1, and some changes during the development of analytical framework are described below.

From the first version of analytical framework, it was found that steps in *Move 3* were not sufficient to analyze the Introductions, so some steps were added in the second version. These steps included *"Announcing present research", "Presenting research questions or hypotheses",* and *"Stating the value of the present research".* Moreover, the step label of *"Step B Describing procedure"* was changed to *"Step D Describing procedure or research methodology".*

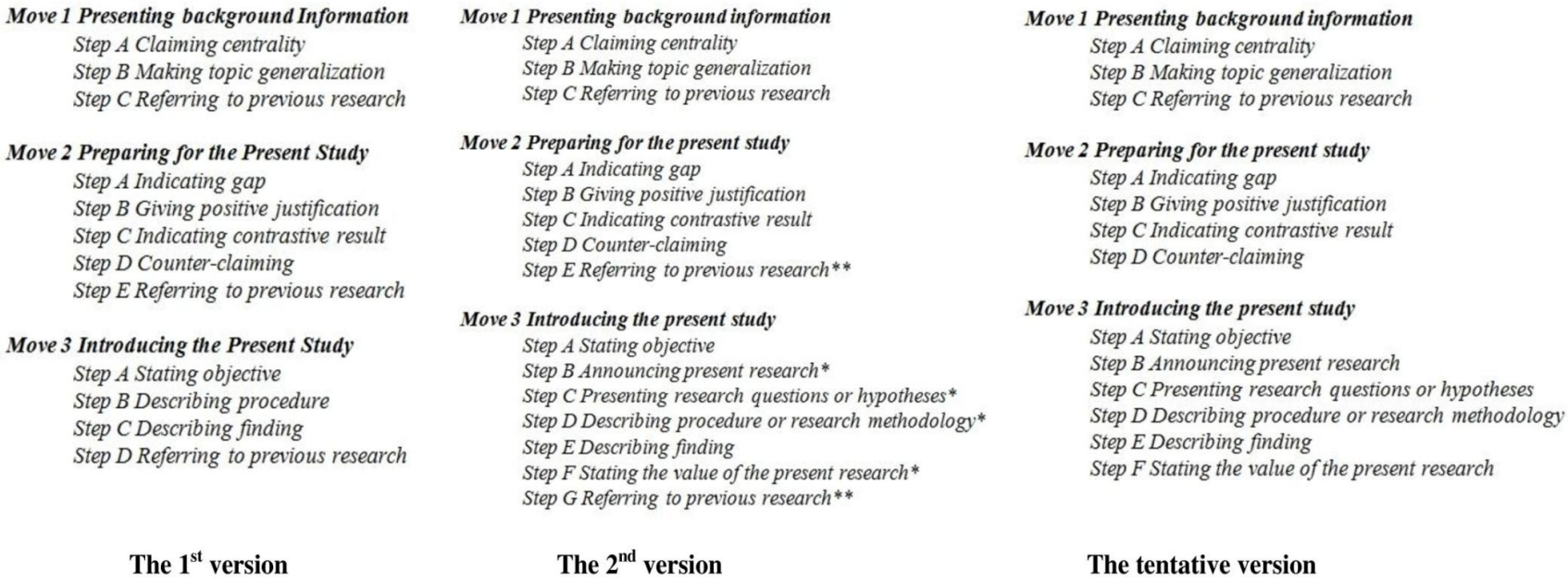


Figure 3.1 Comparison of the previous analytical frameworks and the tentative version

During the pilot study, *Step E Referring to previous research* of *Move 2* was not identified because the researcher and the inter-coder resolved in the coding stage that mentioning previous studies in this move could be specifically identified as *Step A, B, C,* and *D* of *Move 2,* or it may be coded as *Step C Referring to previous research* of *Move 1* if it provides information to help readers understand the research background.

Similarly, *Step G Referring to previous research* in *Move 3 Introducing the present study* was not also identified because referring to previous studies can be particularly coded as *Step A, B, C, D, E,* and *F* of *Move 3,* or it may be coded as *Step C Referring to previous research* of *Move 1.* Thus, in the third version, or tentative version (Table 3.5), there are four steps and six steps in *Move 2* and *Move 3,* respectively.

Table 3.5 Tentative analytical framework of moves and steps in this study

Move 1 Presenting background information
Step A Claiming centrality
Step B Making topic generalization(s)
Step C Referring to previous research
Move 2 Preparing for the present study
Step A Indicating gap
Step B Giving positive justification
Step C Indicating contrastive result
Step D Counter-claiming
Move 3 Introducing the present study
Step A Stating objective
Step B Announcing present research
Step C Presenting research questions or hypotheses
Step D Describing procedure or research methodology
Step E Describing findings
Step F Stating the value of the present research

3.2.2 The tentative analytical framework

In this tentative analytical framework, moves were labeled with numbers 1, 2, and 3 because previous studies showed that these moves were typically arranged in this order.

However, steps in these moves were labeled with letters A to E for two reasons. First, the ranks of these steps varied in different studies. For example, in *Move 3 Introducing the present study* of Kanoksilapatham's 2005 and 2007 models, *Step 1 Stating purposes/objectives* and *Step 2 Detailing procedures* are the same, but *Step 3* in the 2005 model is *Presenting findings,* and it is *Justifying decisions made* in the 2007 model (See Figure 2.4). These step labels convey different communicative functions although they are in the same rank, *Step 3*.

Second, all potential steps may not occur together in the same move in an introduction. There can be only one step or several steps in a move, as steps are choices for authors to use. For example, there is only one step, *Topic generalizations of increasing specificity*, in *Move 1* of Swales's 2004 model, as mentioned earlier in Section 2.3.3.1. However, there are two steps in *Move 1* of Nwogu's 1997 model and three steps in Swales's 1990 and Kanoksilapatham's 2005 models. To prevent the misunderstanding that all proposed steps in the analytical framework must occur, the researcher decided to use letters and note in the coding protocol (see Appendix B) that in some research articles, a particular move may have only one step. The analytical framework of this study is shown in Table 3.5. The details of the moves and steps in the framework are described in the next section.

3.2.3 List and explanation of moves and steps in this study

The research article introduction consists of three moves: *Move 1 Presenting background information*, *Move 2 Preparing for the present study*, and *Move 3 Introducing the present study*. *Move 1* is usually followed by *Move 2* and *Move 3*. However, in some cases, an opening move may not be *Move 1*, and an ending move may not be *Move 3*. Moreover, all three moves may not occur together. Furthermore, moves can be recycled to increase specificity of the topic. The number of move recycles is not limited. Some move patterns are shown in Figure 3.2. Black arrows and black text boxes in the Figure 3.2 indicate move recycles. The number beside an arrow indicates the order of move direction.

Move 1 Presenting background information provides background information to help readers of research articles understand the topic. This move represents an overview or related information in the research area. In medical research articles, this move usually provides information about a particular disease, treatment, and diagnostic methods.

Move 1 consists of three steps, including *Step A Claiming centrality*, *Step B Making topic generalization(s)*, and *Step C Referring to previous research*. As mentioned earlier, a move can have only one step or several steps. Moreover, if there are several steps in a move, a step can be recycled. Furthermore, steps are not required to occur according to the alphabetical order in the code list. An example of *Move 1* is shown in Figure 3.3. The underlined words represent clues for coding. The symbol [R#] at the end of sentences refers to reference of that research article. The number after the letter R is the rank of the references.

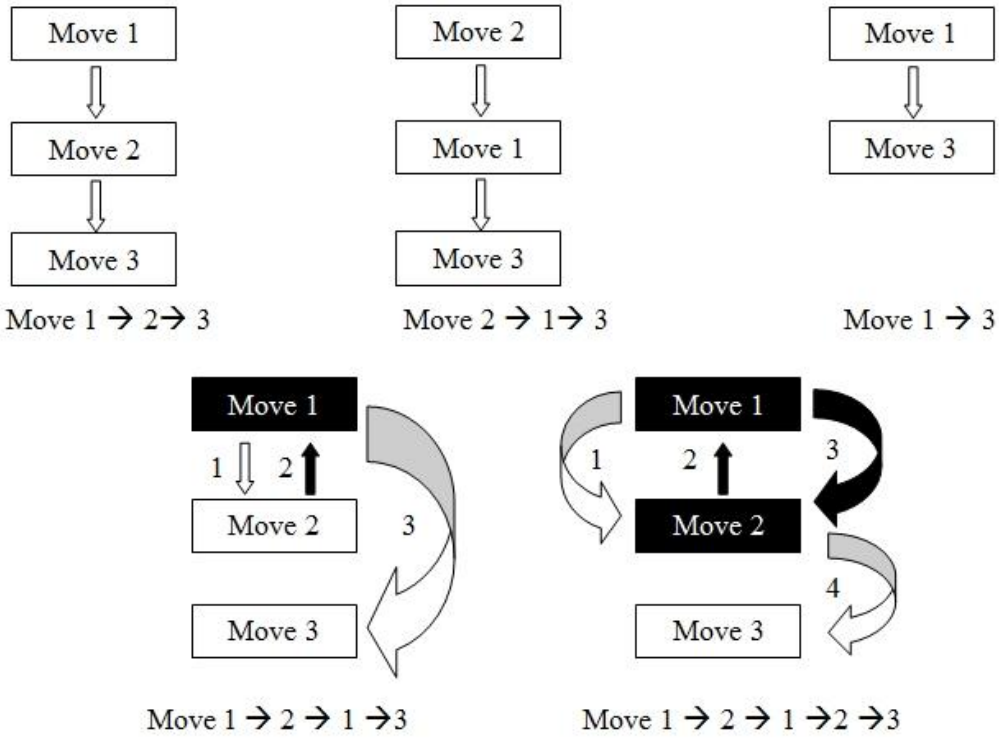


Figure 3.2 Some move patterns from move analysis

From Figure 3.3, sentences number 1 and 2 were coded as *Step A Claiming centrality* based on the key words "life-threatening" and "mainly in Thailand". Sentences number 3-6 were coded as *Step C Referring to previous research* based on reporting verbs "found", "reported" and "described". The last two sentences were coded as *Step B Making topic generalizations* as they described symptoms of human pythiosis.

Title: Application of Immunoblot Assay for Rapid Diagnosis of Human Pythiosis, From: The Journal of the Medical Association of Thailand, 2009; 92 (8): 1063-71	
(1) Human pythiosis is a life-threatening disease caused by the mammalian pathogen Pythium insidiosum. (2) Human pythiosis has been documented mainly in Thailand and occasionally in other tropical and subtropical countries such as Australia, Haiti, New Zealand, and the USA.	MOVE 1 STEP A
(3) The first five cases of human pythiosis were found in rural areas of northern Thailand[R1]. (4) More recently, however, pythiosis cases have been reported from every region of Thailand[R2,3]. (5) Clinical manifestations of the disease have been described in four forms, including cutaneous/subcutaneous[R4], ocular[R5,6], vascular, and disseminated forms[R3,7]. (6) Pythiosis has been reported both in patients with immunological abnormalities and in apparently healthy individuals.	MOVE 1 STEP C
(7) Patients with cutaneous/ subcutaneous, disseminated and vascular forms are usually associated with hematological disorders, such as thalassemia, leukemia or pyroxysmal nocturnal hemoglobinuria[R2,7,8]. (8) In contrast, most ocular cases are usually found in healthy individuals[R5,9].	MOVE 1 STEP B

Figure 3.3 Examples of steps coded in *Move 1*

The details of steps in *Move 1* are explained as follows:

Step A Claiming centrality. This step shows that the research topic is useful, relevant, important, or worth investigating. It also illustrates that the research area is lively, significant and well-established. This step may be represented by showing a strong impact upon people, countries, and the world. This can be seen from keywords such as "severe", "globally" and "morbidity and mortality". The step has evaluative words, intensifiers, or quantitative words such as "great importance", "increasingly interested", and "central issue", to claim centrality. The claim is usually presented as an opening sentence or a topic sentence. Sometimes, striking evidence such as statistics is used in this step. The sample phrases indicating *Step A Claiming centrality* are underlined as shown below:

> *As in previous influenza epidemics and pandemics, pregnant women with 2009 pandemic influenza A (H1N1) appear to have an increased risk of severe disease [R1-7].*
>
> *(Janice et al., 2010)*

> *Three times in the past century, pandemic influenza viruses have circulated globally and caused increased morbidity and mortality among persons who were not generally at risk for severe seasonal influenza [R1].*
>
> *(Libster et al., 2010)*

> *Despite the implementation of preoperative preventive measures, which include skin cleansing with povidone–iodine, surgical-site infection occurs in 300,000 to 500,000 patients who undergo surgery in the United States each year [R1-6].*
>
> *(Darouiche et al., 2010)*

> *Nasal carriers of high numbers of Staphylococcus aureus organisms have a risk of health care-associated infection with this microorganism that is three to six times the risk among noncarriers and low-level carriers [R1-3].*
>
> *(Bode et al., 2010)*

Step B Making topic generalization(s) gives overviews about the research field. The contents in this step can be knowledge, consensus, practice and description of phenomena. This step represents a more neutral kind of general statement than *Step A Claiming centrality*, which has evaluative words, intensifiers, or quantitative words. *Step B Making topic generalization(s)* can be inferred by linking the text with the title.

In the article *"Multicenter Analysis of Glucocerebrosidase Mutations in Parkinson's Disease"* (Hsu et al, 2009), the sample sentence describes Parkinson's disease as a rare mendelian disorder and provides more information about its manifestations.

> *In this rare mendelian disorder, lysosomal accumulation of glucocerebroside results in a broad spectrum of disease manifestations including hepatosplenomegaly, anemia, thrombocytopenia, bone disease, and, at times, neurologic involvement [R1,2].*
>
> *(Sidransky et al., 2009)*

From the article *"Effect of Pneumococcal Conjugate Vaccine on Pneumococcal Meningitis"*, the statement below gives information about the practice of vaccination in the United States.

> *Licensed in 2000, PCV7 is recommended by the Advisory Committee on Immunization Practices for all children in the United States 2 to 23 months of age and for children 24 to 59 months of age who are at increased risk for pneumococcal disease [R14,15].*
>
> *(Hsu et al., 2009)*

Step C Referring to previous research mentions previous studies in the research. This step relates what has been found with who has found it. Mostly, this step includes information about the researchers who published these results and specification of the findings. However, *Step C* sometimes mentions the researchers in general such as using the word "investigators" and "researchers", instead of their names. Moreover, words regarding the research may be used such as "the studies", "previous research", and "analyses". Reporting verbs, such as "find", "report", and "reveal", are also found in this step.

> *Multiple independent studies have reported an increased frequency of GBA mutations in various cohorts of patients with parkinsonism [R3-21].*
>
> *Pedigree analyses revealed that relatives of patients with Gaucher's disease, many of whom were obligate heterozygotes, had an increased incidence of Parkinson's disease [R27,28].*
>
> *(Sidransky et al., 2009)*

Move 2 Preparing for the present study shows how the authors establish a niche for their research and prepares the readers for the next move, introducing new research. This move can be represented by four steps, including *Step A Indicating gap*, *Step B Giving positive justification*, *Step C Indicating contrastive result*, and *Step D Counter-claiming*. Examples of *Move 2* are shown below.

> *However, several genomewide association studies have not identified this locus, and the degree of association has remained somewhat unclear, as many studies were not large enough to unequivocally label GBA mutations as risk alleles associated with Parkinson's disease.*
>
> *Although N370S is also common in European populations and is exclusively associated with non-neuronopathic Gaucher's disease, it has not been encountered among Asians [R33].*
>
> *(Sidransky et al., 2009)*

The details of steps in *Move 2* are explained as follows:

Step A Indicating gap points out a research space that has not yet been studied as in the example below.

> *However, several genomewide association studies have not identified this locus, and the degree of association has remained somewhat unclear, as many studies were not large enough to unequivocally label GBA mutations as risk alleles associated with Parkinson's disease.*
>
> *(Sidransky et al., 2009)*

Step B Giving positive justification describes advantages or reasons for conducting the research as in the example below.

> *Therefore, rapid and reliable diagnostic tools are necessary for an effective treatment.*
>
> *(Supabandhu et al., 2009)*

Step C Indicating contrastive result describes conflicting research results as in the example below.

> *Although N370S is also common in European populations and is exclusively associated with non-neuronopathic Gaucher's disease, it has not been encountered among Asians [R33].*
>
> *(Sidransky et al., 2009)*

Step D Counter-claiming is identified where the restraints and negative evaluation of previous research are stated as in the example below.

> *Standard diagnostic techniques, such as culturing and zoospore induction, take several days and require taxonomic expertise, causing delayed treatment.*
>
> *(Supabandhu et al., 2009)*

Move 3 Introducing the present study provides information of the present study. This information may be presented by six steps: *Step A Stating objective*, *Step B Announcing present research*, *Step C Presenting research questions or hypotheses*, *Step D Describing procedure or research methodology*, *Step E Describing findings*, and *Step F Stating the value of the present research*. An example of *Move 3* is shown below.

> *This international collaborative study of GBA mutations in patients with Parkinson's disease was undertaken to better ascertain the frequency of GBA mutations by pooling data for individual persons from 16 centers, representing 4 continents, including 5691 patients and 4898 controls. Findings based on the data from 13 of the 16 centers (4185 of the case patients and 3597 of the controls) have been published previously [R5-16,19].*
>
> *(Hsu et al., 2009)*

Step A Stating objective gives the purpose of the research. The objectives are stated explicitly by using the words "aim", "objective", "goal", etc. An example is shown below.

> *The goal of the current study was to examine the effect of early palliative care integrated with standard oncologic care on patient-reported outcomes, the use of health services, and the quality of end-of-life care among patients with metastatic non-small-cell lung cancer.*
>
> *(Temel et al., 2010)*

Step B Announcing present research describe what the authors set out to do. This can be seen from the main verb. The verbs used in this step include "perform", "examine", "explore", "apply", etc. Examples are shown below.

> *As a result, the authors conducted a randomized control trial to compare cisplatin plus fluorouracil with cisplatin in the treatment of patients with locally advanced carcinoma of the cervix.*
>
> *(Sukhaboon et al., 2009)*

> *Here, we describe a clinical evaluation of the novel, potent, orally active PARP inhibitor olaparib (4-[(3-{[4-cyclopropylcarbonyl)piperazin-1-yl]carbonyl}-4-fluorophenyl)methyl]phthalazin-1(2H)-one; also known as AZD2281 and previously known as KU-0059436)[R17] (Fig. 2 in the Supplementary Appendix), with a focus on BRCA-mutation carriers.*
>
> *(Kantarjian et al., 2010)*

Step C Presenting research questions or hypotheses states the research question or hypothesis. The example is shown below.

> *We hypothesized that patients who received early palliative care in the ambulatory care setting, as compared with patients who received*

> *standard oncologic care, would have a better quality of life, lower rates of depressive symptoms, and less aggressive end-of-life care.*
>
> *(Temel, 2010)*

Step D Describing procedure or research methodology gives information about research methodology or research procedure as in the examples below.

> *The Epidemiologic Stroke (TES) study is the first large community based cohort study being ongoing to investigate the relationship between various risk factors, lifestyles and stroke in Thailand.*
>
> *(Hanchaiphiboolkul, 2011)*

> *The specificity of the assay was evaluated using immunized rabbit sera and naturally infected patients' sera with other proven fungal infections.*
>
> *(Supabandhu et al., 2009)*

> *Response rate was chosen as the primary end point of the comparison and toxicity was selected as secondary end points.*
>
> *(Sukhaboon et al., 2009)*

Step E Describing findings states the research findings as in the examples below.

> *An important finding was that the IGS was associated with the risk of death and metastasis not only in breast cancer but also in lung cancer, prostate cancer, and medulloblastoma.*

> *This finding suggests that the IGS represents general biologic features shared by several different types of tumor.*
>
> *(Liu et al., 2007)*

Step F Stating the value of the present research states the value or implication from the findings in the present research. This step differs from *Step B Giving positive justification* of *Move 2* in terms of specificity. *Step B Giving positive justification* in *Move 2* presents the advantages of conducting research in the niche area. However, *Step F Stating the value of the present research* in *Move 3* shows the value of the current research, so *Move 3 Step F* is more specific than *Move 2 Step B.* An example of this move is shown below.

> *The outcome of the present study would provide useful information for clients, providers, and policy makers in a family planning program in considering options for emergency contraception.*
>
> *(Taneepanichskul, 2009)*

3.3 Research Procedures

The research procedures of this move analysis were divided into five main stages as follows:

Stage 1: Corpus compilation

In the first stage, two comparable corpora were compiled. The first corpus consists of medical research article introductions published in Thai medical journals, and the second corpus comprises medical research article introductions published in international medical journals. All articles were published during 2005-2009. The selection criteria were previously described in *Section 3.1.5.1 Selection of the medical journals*, *3.1.5.2 Selection of the medical research articles*, and *3.1.5.3 Selection of the medical research article introductions*. After that, the corpora were used to create coding forms for move analysis. The information about coding forms is described below in Stage 3.

Stage 2: Developing the analytical framework

At this stage, possible moves and steps were determined based on the results from previous studies on move analysis of research article introductions, to establish a comprehensive analytical framework. Then, a pilot coding was conducted to test and adjust the analytical framework. Five introductions from the Thai medical journal corpus and five introductions from the international medical journal corpus were coded. The results showed that although all three moves (see *Section 3.2 The analytical framework*) can be applied to all coding units, some steps in *Move 3* did not occur in the corpora, for example, *Step 3 Indicating RA structure* in Swales' (1990) model and *Step 3 Definitional clarifications* in Swales's (2004) model. Names of some moves and steps were adjusted if they conveyed similar communicative purposes. For instance, *Step 6 Stating the value of the present research* in Swales's (2004) model is similar to *Step 4 Stating implications* in Kanoksilapatham's (2007) model. If any coding units show the

value or implications of the present research, they will be identified as *Step F Stating the value of the present research*.

Stage 3: Preparing the coding forms

After developing the analytical framework, the Introduction from each article was segmented into each coding form (see a sample coding form in Appendix D). The coding forms were used in the coding process. The coding unit of this study is a sentence because it usually conveys one proposition and has exact boundaries defined by an initial capital letter and a full stop. Moreover, from previous results of move analysis, the boundaries of moves and steps are separated by sentence boundary. If a sentence has more than one clause, its communicative function is realized from all clauses; that is the entire sentence. If that coding unit has more than one function, the major function of that unit will be coded.

Stage 4: Coding process

This stage includes three steps. First, the entire corpora were coded by the researcher to identify moves and steps. Second, the inter-coder reliability was assessed. Finally, problematic coding units were re-coded to reach a consensus.

In the first step, if there were any problematic coding units, the researcher adjusted the definitions of moves and steps so that the coding units can be clearly identified.

For the inter-coder reliability, this step consists of selecting the inter-coder, training the inter-coder, independent coding, and calculating the inter-coder reliability as explained below.

a) Selection of the inter-coder: The inter-coder is a physician at a private hospital. She has earned a Doctor of Medicine (M.D.) degree and Bachelor of Arts (B.A.) degree, majoring in English. She also holds a Master of Arts (M.A.) degree in Interpretation from the Faculty of Arts, Chulalongkorn University. In her programme, she took a course in discourse analysis, so she is familiar with text analysis. From her background knowledge in both medical and linguistic disciplines, she is competent enough to be the inter-coder for this study.
b) Inter-coder training: The inter-coder participated in a training session in which the researcher explained the rationale and procedures of this study, how to use

the analytical framework and how to code the medical research article introductions into the coding forms. During the training, the inter-coder practiced coding two samples of introductions. Then, the researcher compared the results from the inter-coder with the researcher-coded results. After that, the researcher and the inter-coder discussed problematic coding units and problems of coding protocols to achieve a consensus.

c) Independent coding: Five introductions (10 percent) were randomly selected from the entire corpora (50 introductions). Then, the coders independently coded the samples. After the coding was completed, the researcher discussed the coding with the inter-coder to see if there were any disagreements.

d) Calculating the inter-coder reliability: The coefficient of the reliability was calculated to evaluate consistency of the coding and the acceptability of the coding results.

Trakulkasemsuk (2002: 35) noted a formula suggested by Scholfield (1997) for checking the reliability, which is:

$$Coefficient\ of\ the\ reliability = \frac{Number\ of\ total\ agreement\ of\ all\ judges}{Total\ number\ of\ tokens\ coded\ by\ researcher}$$

In this study, the coefficient of the reliability of coding for moves and steps in the samples can be calculated as follows:

$$Coefficient\ of\ the\ reliability = \frac{68}{77} = 0.88$$

As a result, the coefficient of the reliability of coding was high enough (88%) for result acceptance.

Stage 5: Presenting the move analysis model

At this stage, the coding results were analysed in each corpus. Moves were categorized as obligatory, conventional and optional, using the same cut-off frequencies as in Rasmeenin's (2006) and Amnuai and Wannaruk's (2013) studies as shown in Table 3.6.

Table 3.6 Categorization of moves and steps based on frequency of occurrence

Category	Frequency of occurrence
Obligatory	100%
Conventional	60-99%
Optional	less than 60%

Patterns of moves and steps were identified and categorized as linear and cyclical. The percentages of these data were calculated. After that, the findings of the two corpora, Thai medical journals and international medical journals, were compared to find similarities and differences. The findings from this study were also compared with the findings in previous studies. Finally, move and step models of introduction sections of research articles published in Thai and international medical journals were presented.

3.4 Summary

This chapter has described the processes of how move analysis is done. The research procedures consist of five main stages. First, the two comparable corpora were compiled from Thai medical research articles and international medical research articles. Second, the analytical framework was developed. Third, the coding forms were prepared. Next, moves and steps were coded by the researcher and the inter-coder, with inter-coder reliability assessment.

After the qualitative analysis by move and step identification, the identified moves and steps were analysed both quantitatively and qualitatively. To answer RQ1 and RQ2, the Thai and international medical journal corpora were separately analysed in terms of frequency of occurrence and patterns of moves and steps. Their move analysis models were also presented.

Finally, to answer RQ3, the findings from the two corpora were compared in terms of move and step occurrences, patterns of moves, sequences of moves, and move analysis models. The next chapter will demonstrate the results of this move analysis.

CHAPTER 4
DATA PRESENTATION AND INTERPRETATION

This chapter presents the findings of the move analysis. The data was analysed and interpreted in order to answer the following research questions:

RQ1 What are the moves and steps of the Introduction section in English medical research articles published in Thai medical journals?

RQ2 What are the moves and steps of the Introduction section in English medical research articles published in international medical journals?

RQ3 What are the similarities and differences in the moves and steps between English medical research article introductions published in Thai medical journals and international medical journals?

4.1 Moves and steps of the Introduction section in English medical research articles published in Thai medical journals

4.1.1 Frequency of occurrence

The data from move analysis revealed that all three moves in the analytical framework were found in the Thai medical journal corpus. For steps in each move, most of them were identified, but a few did not occur in the corpus. The identified moves and steps with their frequencies of occurrence are described in this section.

4.1.1.1 Move occurrences

From Table 4.1, we can see that all three moves were identified in the Thai medical journal corpus. *Move 1 Presenting background information* and *Move 3 Introducing the present study* occurred in 100% of the selected introductions, so they are obligatory. *Move 2 Preparing for the present study* was found in 88% of the corpus. It is in the conventional category. The findings show that the English introductions in Thai medical journals were written in accordance with the three-move CARS model.

Table 4.1 Frequency of occurrence of moves in Thai medical journal corpus

Move	**Frequency of occurrence** (Number of articles, N=25)	**Percentage (%)**
Move 1 Presenting background information	25	100
Move 2 Preparing for the present study	22	88
Move 3 Introducing the present study	25	100

In the three introductions (T1, T15 and T22) which did not employ *Move 2 Preparing for the present study*, their move pattern was *Move 1* → *Move 3*. The authors of these articles stated background information of the study in *Move 1* and then shifted to *Move 3* by briefly introducing their studies. The reason why the writers did not use *Move 2* may be the continuation of previous research. By reading the background of the study in *Move 1*, the readers understand that the present work was done with a rationale similar to that of the previous studies. Thus, indicating gap, giving positive justification, stating contrastive results, and counter-claiming in *Move 3* are not necessary.

4.1.1.2 Step occurrences

Table 4.2 shows that all three steps in the analytical framework were identified in *Move 1 Presenting background information.* All four steps were identified in *Move 2 Preparing for the present study*, and all six steps were identified in *Move 3 Introducing the present study.* A step is classified as obligatory (100%), conventional (60-99%) or optional (less than 60%) based on its frequency of occurrence.

In *Move 1 Presenting background information, Step A Claiming centrality* and *Step B Making topic generalizations* were found in all introductions, so they are obligatory. However, *Step C Referring to previous research* is a conventional step because it was found in 72% of the corpus. It can be assumed that the first two steps are considered more important than the last step because *Step A Claiming centrality* attracts readers' attention and *Step B Making topic generalizations* provides sufficient background of the research field to readers. *Step C Referring to previous research* shows evidence of previous studies and is regarded as a supplement to *Step A* and *Step B.*

Table 4.2 Frequency of occurrence of steps in each move of Thai medical journal corpus

Move/Step	Frequency of occurrence	Percentage (%)
Move 1 Presenting background information	**25**	**100**
• *Step A Claiming centrality*	25	100
• *Step B Making topic generalization(s)*	25	100
• *Step C Referring to previous research*	18	72
Move 2 Preparing for the present study	**22**	**88**
• *Step A Indicating gap*	11	44
• *Step B Giving positive justification*	8	32
• *Step C Indicating contrastive result*	7	28
• *Step D Counter-claiming*	2	8
Move 3 Introducing the present study	**25**	**100**
• *Step A Stating objective*	20	80
• *Step B Announcing present research*	5	20
• *Step C Presenting research questions or hypotheses*	4	16
• *Step D Describing procedure or research methodology*	1	4
• *Step E Describing findings*	1	4
• *Step F Stating the value of the present research*	2	8

For *Move 2 Preparing for the present study*, the first four steps were identified in different percentages. Among the four steps identified, *Step A Indicating gap* occurred with the highest percentage (44%). *Step B Giving positive justification* and *Step C Indicating contrastive result* were found in similar percentages of introductions, 32% and 28%, respectively. *Step D Counter-claiming* had the lowest percentage (8%).

In *Move 3 Introducing the present study*, *Step A Stating objective* was the most frequently employed step and was regarded as conventional. Its percentage (80%) is four times and five times higher than *Step B Announcing present research* (20%) and *Step C Presenting research questions or hypotheses* (16%), respectively. The rest of steps in this move were found in small numbers of introductions: two articles employed *Step F Stating the value of the present research* (8%), one article employed *Step D*

Describing procedure or research methodology (4%), and one article employed *Step E Describing findings* (4%).

Based on the above findings, among three moves, *Move 1 Presenting background information* is the most important move, as it occurred in all introductions of this corpus and almost all steps (two out of three steps) in this move are obligatory. Thus, to produce *Move 1*, *Step A Claiming Centrality* and *Step B Making Topic Generalizations* are necessary components. *Move 2 Preparing for the present study* is important, but it can be omitted (frequency of occurrence of 88%).Moreover, all four steps in this move are just optional. This means a writer can play with step selection from these choices. This is why the percentages of these steps are varied. Thus, its importance is less than that of *Move 1*. The last move, *Move 3 Introducing the present study*, is also important because of its 100% frequency of occurrence. This move is similar to *Move 2* in that there are several steps. However, *Step A Stating objective* in *Move 3* is conventional, while other steps are optional. Therefore, regarding categories of move and step, the rank of importance of these moves is shown below:

Move 1>Move 3 >Move 2

4.1.2 Patterns of moves and steps

A move pattern is the order of moves identified in an introduction. Move patterns can be categorised into two groups: linear and cyclical patterns. For step patterns, this study focuses on patterns of steps in *Move 1* because this move was usually used as the opening move, and there are many steps which occurred and recurred in this move, whereas *Move 2* and *Move 3* generally have only one or two steps without repetition.

Identified moves and steps of all introductions in the Thai medical journal corpus are shown in Figure 4.1. The moves are illustrated by the format of a box: light grey boxes represent *Move 1 Presenting background information*, dark grey boxes represent *Move 2 Preparing for the present study*, and patterned boxes represent *Move 3 Introducing the present study*. For steps, the number and letter in a box indicate a move and step, respectively. For example, the dark grey box labelled “2A” indicates that the coding unit belongs to *Move 2 Preparing for the present study* and *Step A Indicating gap*.

Thai corpus	Order of move-step														
	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	#15
T1	1B	1A	1B	1A	1B	1A	1B	1A	1B	3A					
T2	1B	1A	1B	1C	1B	1A	2C	3A							
T3	1A	1B	1C	2B	3A										
T4	1A	1B	1C	1B	1C	1A	2B	1C	1B	3A	3C	3B	3E	3F	
T5	1A	1B	1A	1B	2D	1B	1A	1B	1A	3A					
T6	1A	1C	1A	2A	1A	2B	1A	1C	2B	3A					
T7	1B	1A	1B	1A	1C	1A	1B	2C	3A						
T8	1A	1B	2A	3A	3F										
T9	1B	1A	2C	1A	2A	1A	2A	3A							
T10	1A	1B	1C	1A	1B	2B	1B	3B							
T11	1A	1B	2C	3A	3D										
T12	1B	1C	1B	1A	1B	1C	1B	1C	1A	1B	1A	2C	1B	2A	3A
T13	1A	1C	1B	2B	3B										
T14	1A	1B	1A	1C	1B	2B	1B	1A	2A	3A					
T15	1C	1A	1C	1B	1A	1C	1B	1A	3C	3A					
T16	1A	1B	1A	1B	1A	1B	2D	3A							
T17	1A	1C	1B	1C	1B	1A	1B	2A	3A						
T18	1B	1A	1B	1C	1B	2A	1B	1C	1A	1B	3A				
T19	1A	1C	1B	1C	1B	1C	1A	2A	3C						
T20	1A	1B	2A	1B	1A	1B	3A								
T21	1A	1B	1C	1A	1B	3B	1B	2B							
T22	1B	1A	1B	1C	1A	1C	3B								
T23	1B	1A	1B	1C	2C	1B	3A								
T24	1A	1B	1C	1B	1C	2A	3A								
T25	1A	1B	1A	1C	2A	2C	1B	1A	2B	2A	2B	3A	3C		

Figure 4.1 Identified moves and steps in Thai medical journal corpus

4.1.2.1 Move patterns

Based on data in Figure 4.1, six move patterns were identified from the Thai medical journal corpus (Table 4.3).

Table 4.3 Move patterns in Thai medical journal corpus

No.	Move pattern	No. of articles	Percentage (%)
1	M1>M2>M3	4	40
2	M1>M2>M1>M3	6	24
3	M1>M3	3	12
4	M1>M2>M1>M2>M3	3	12
5	M1>M2>M1>M2>M1>M2>M3	2	8
6	M1>M3>M1>M2	1	4
Total		**25**	**100**

These move patterns were categorized into linear and cyclical patterns. Patterns 1 and 3 are linear as the moves in these patterns were used only once in a one-way direction. Patterns 2, 4, 5 and 6 are cyclical patterns because there is move recycling in these patterns. Linear patterns and cyclical patterns identified are in similar percentages of the corpus, 52% and 48%, respectively (Table 4.4). The most frequently used linear pattern was M1>M2>M3, as in Swales's 1990 CARS model. This pattern occurred in 40% of the corpus. The most frequently used cyclical pattern was M1>M2>M1>M3 (24%). This pattern represents repetition of *Move 1* to increase specificity as in Swales's 2004 revised model.

Table 4.4 Linear and cyclical patterns in Thai medical journal corpus

Move pattern	No. of articles	Percentage (%)
Linear M1>M2>M3 M1>M3	13	52
Cyclical M1>M2>M1>M3 M1>M2>M1>M2>M3 M1>M2>M1>M2>M1>M2>M3 M1>M3>M1>M2	12	48

4.1.2.2 Step patterns

All introductions in the Thai medical journal corpus started with *Move 1 Presenting background information.* In this move, 22 step patterns were identified. All step patterns identified are illustrated in Appendix E. These step patterns can be categorised into linear and cyclical patterns in the same way as move patterns.

From Table 4.5, it can be seen that the majority (76%) of step patterns are cyclical. The rest (24%) are linear.

Table 4.5 Step patterns in *Move 1* used as the opening move of Thai medical journal corpus

Step pattern	No. of articles	Percentage (%)
Linear	6	24
Cyclical	19	76
Total	**25**	**100**

Regarding the length of a move, from all findings in this section (4.1.2), *Move 1 Presenting background information* is longer than other moves even though *Move 1* consists of fewer steps. Steps are likely to be recycled in *Move 1*, so this makes *Move 1* a long and continuous move.

4.1.3 Move analysis model of Thai medical journal corpus

From the above data, the model of Thai medical research articles introductions is illustrated below (Figure 4.2). The first move is *Presenting background information*. The second move is *Preparing for the present study* and the third move is *Introducing the present study*. The specificity of information increases from *Move 1 Presenting background information* to *Move 3 Introducing the present study*.

The order of steps shown in the model is based on the frequency of occurrence and the order of steps in the corpus. For *Move 1*, although *Claiming centrality* and *Making topic generalizations* occurred with the same percentage (100%), *Claiming centrality* is in the first rank because 64% of the corpus (16 out of 25 articles) has this step as the first step in *Move 1*.

From move patterns in Table 4.3, we can see that 84% of introductions in the Thai medical journal corpus started with *Move 1*, had *Move 2* in the middle, and ended with *Move 3*. Moreover, among this group, almost half of the corpus (44%) recycled *Move 1* or *Move 1* and *Move 2*. These patterns are M1>M2>M1>M3 (24%), M1>M2>M1>M2>M3 (12%), and M1>M2>M1>M2>M1>M2>M3 (8%). Thus, it is possible to have move recycling to increase specificity of information, so an arrow with this remark is added to this model.

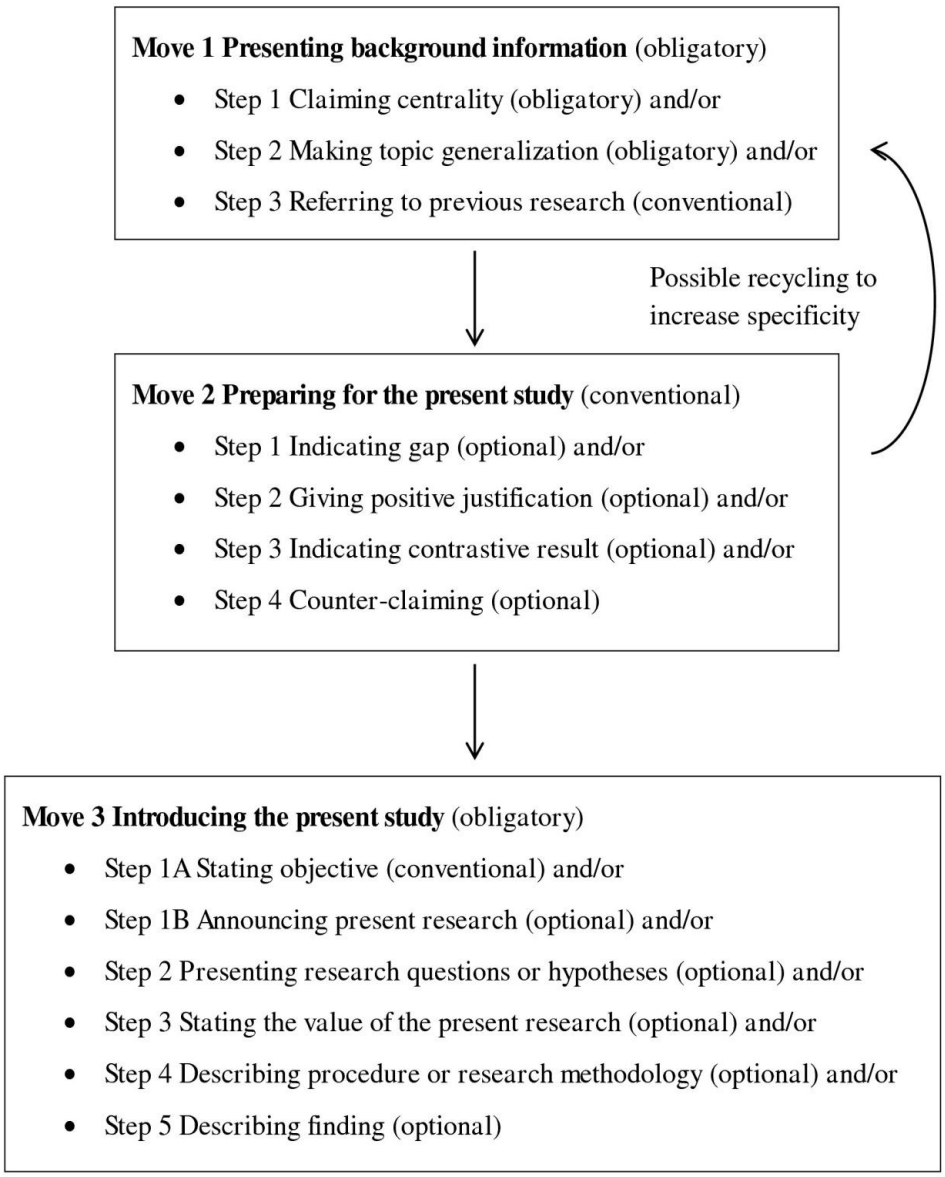


Figure 4.2 Move analysis model of the Introduction section in Thai medical journal corpus

For step labels, in *Move 3*, the first two steps were labelled as *Step 1A Stating objective* and *Step 1B Announcing present research* instead of *Step 1* and *Step 2,* because these two steps provide information about research purposes but in different forms, purposively and descriptively. In Swales's 1990 model, these two steps are in *Step 1,* but they differ slightly in step labels. *Step 1A* is *Outlining purposes* and *Step 1B* is *Announcing present research*. Moreover, these steps are in the same step, *Step 1 Announcing present research descriptively and/or purposively,* in Swales's 2004 model as shown in Figure 2.1. Thus, *Stating objective* and *Announcing present research* of this study are in *Step 1,* but with labels *1A* and *1B*, respectively. The other steps in this move are labeled as *Step 2-5.*

4.2 Moves and steps of the Introduction section in English medical research articles published in international medical journals

4.2.1 Frequency of occurrences

4.2.1.1 Move occurrences

As illustrated in Table 4.6, all three moves in the analytical framework were identified in the international medical journal corpus. *Move 1 Presenting background information* and *Move 2 Preparing for the present study* were found in all research articles (100%), so they are obligatory. *Move 3 Introducing the present study* was found in a similar number (96%), but it is regarded as a conventional move due to the classification criteria (Table 3.6).

Table 4.6 Frequency of occurrence of moves in international medical journal corpus

Move	**Frequency of occurrence** (Number of articles, N=25)	**Percentage (%)**
Move 1 Presenting background information	25	100
Move 2 Preparing for the present study	25	100
Move 3 Introducing the present study	24	96

The only research article (I19) which did not have *Move 3 Introducing the present study* has M1>M2>M1 move pattern. The article's title is *"Cytoplasmic p21 expression levels determine cisplatin resistance in human testicular cancer."* The authors started the introduction with *Move 1 Presenting background information*, stating the importance of testicular cancer and cisplatin-containing chemotherapy. Next, the authors changed to *Move 2 Preparing for the present study* by stating that the molecular mechanism of cisplatin resistance remains unclear. Then, the authors shifted back to *Move 1* to provide more specific background information, by describing some proteins relating to cisplatin resistance and concluding that p21 plays an important role in preventing DNA damage-induced apoptosis, which results from cisplatin-containing chemotherapy.

4.2.1.2 Step occurrences

From Table 4.7, all three steps were found in *Move 1 Presenting background information.* Four steps were found in *Move 2 Preparing for the present study* and six steps were found in *Move 3 Introducing the present study.* The steps found in this corpus are the same as those found in the Thai medical journal corpus.

In the first move, *Presenting background information*, *Step B Making topic generalization(s)* was identified in all introductions, so this step is obligatory. *Step A Claiming centrality* and *Step C Referring to previous research* were found in 96% and 84% of the corpus, respectively. They are conventional steps.

In *Move 2 Preparing for the present study,* the most employed step is *Step A Indicating gap* (68%), and it is conventional. *Step D Counter-claiming* (40%), *Step C Indicating contrastive result* (28%), and *Step B Giving positive justification* (12%) are optional. This indicates *Step A Indicating gap* is an effective writing strategy in the view of authors of international medical journals.

For *Move 3 Introducing the present study*, the only conventional step is *Step B Announcing present research*, with the highest percentage (80%). *Step A Stating objective* (40%) is in the second rank. *Step C Presenting research questions or hypotheses, Step E Describing findings,* and *Step F Stating the value of the present research* were identified with the same percentage (12%). *Step D Describing procedure or research methodology* occurred in only 4% of the corpus. The authors may think that

research methodology should be described in the Methods section, not the Introduction section.

Table 4.7 Frequency of occurrence of steps in each move of international medical journal corpus

Move/Step	Frequency of occurrence	Percentage (%)
Move 1 Presenting background information	**25**	**100**
• *Step A Claiming centrality*	24	96
• *Step B Making topic generalization(s)*	25	100
• *Step C Referring to previous research*	21	84
Move 2Preparing for the present study	**25**	**100**
• *Step A Indicating gap*	17	68
• *Step B Giving positive justification*	3	12
• *Step C Indicating contrastive result*	7	28
• *Step D Counter-claiming*	10	40
Move 3 Introducing the present study	**24**	**96**
• *Step A Stating objective*	10	40
• *Step B Announcing present research*	20	80
• *Step C Presenting research questions or hypotheses*	3	12
• *Step D Describing procedure or research methodology*	1	4
• *Step E Describing findings*	3	12
• *Step F Stating the value of the present research*	3	12

4.2.2 Patterns of moves and steps

4.2.2.1 Move patterns

From data in Figure 4.3, 10 move patterns were identified from the international medical journal corpus (Table 4.8). The first three patterns occurred in relatively equal percentages: M1>M2>M3 (24%), M1>M2>M1>M3 (24%), and M1>M2>M1>M2>M3 (20%). In terms of pattern category, only the first pattern is a linear pattern. According to Table 4.9, cyclical move patterns (76%) were found three times as often as linear move patterns (24%). It can be assumed that the recycling move is a successful strategy for writing in international medical journals.

Inter corpus	Order of move-step											
	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12
I1	1A	1C	1B	1C	2A	3A						
I2	1A	1B	1A	1B	2C	2D	3C	3B				
I3	1B	1A	1C	1B	2A	1B	2A	3B	3A			
I4	2A	1B	1C	1B	1A	1B	1C	2A	2C	3A		
I5	1A	1B	2A	1B	1A	1B	1C	2A	3A			
I6	1A	1B	2A	1C	1A	1B	2D	3B				
I7	1A	1B	2D	1C	1B	1A	1C	2B	3B			
I8	1A	1B	1A	1B	2C	3B						
I9	1A	1B	1C	1B	1C	1B	1C	1B	1C	2D	1A	3A
I10	1B	1A	1B	2C	2D	2A	1C	2A	1B	3A	3B	
I11	1A	1B	1A	1C	1A	2C	1C	1B	3B	1C		
I12	1B	1A	1B	2A	1B	3B						
I13	1C	1A	1C	1B	1A	2A	1B	3B	1B	3A	3B	3F
I14	1A	1B	1C	2D	3B							
I15	2A	1A	2C	1B	1C	2B	2D	1C	3B			
I16	1B	1C	3C	1B	1C	1A	2C	2D	1B	3B	3F	
I17	1B	1C	1B	1C	1B	2A	1B	3B	3E			
I18	1A	3B	1B	3A	3E	1C	3F					
I19	1A	1B	2A	1A	1B	1C	1B	1A	1B	1A		
I20	1B	1A	1B	2A	1C	1A	3B	3E				
I21	1A	1B	1A	1C	1A	1C	1B	1A	1B	2A	3B	
I22	1A	2A	1B	2B	2A	2D	2A	3B	3D			
I23	1A	1B	1C	2A	2D	3C	3A	3B				
I24	1B	1A	1C	2A	1A	1B	1C	3A	3B			
I25	1B	1A	1C	2A	1A	1B	1A	1C	3B			

Figure 4.3 Identified moves and steps in international medical journal corpus

Table 4.8 Move patterns in international medical journal corpus

No.	Move pattern	No. of articles	Percentage (%)
1	M1>M2>M3	6	24
2	M1>M2>M1>M3	6	24
3	M1>M2>M1>M2>M3	5	20
4	M1>M3>M1>M2>M1>M3	2	8
5	M1>M2>M1	1	4
6	M2>M1>M2>M3	1	4
7	M1>M2>M1>M3>M1	1	4
8	M1>M2>M1>M2>M1>M3	1	4
9	M1>M2>M1>M3>M1>M3	1	4
10	M2>M1>M2>M1>M2>M1>M3	1	4
Total		**25**	**100**

Table 4.9 Linear and cyclical patterns in international medical journal corpus

Move pattern	No. of articles	Percentage
Linear M1>M2>M3	6	24%
Cyclical M1>M2>M1>M3 M1>M2>M1>M2>M3 M1>M3>M1>M2>M1>M3 M1>M2>M1 M2>M1>M2>M3 M1>M2>M1>M3>M1 M1>M2>M1>M2>M1>M3 M1>M2>M1>M3>M1>M3 M2>M1>M2>M1>M2>M1>M3	19	76%

4.2.2.2 Step patterns

As mentioned earlier in 4.1.2, this study focuses on step patterns in *Move 1 Presenting background information* used as the opening move. Based on data in Figure 4.3, there are 23 introductions using *Move 1* as the opening move. Fourteen step patterns were identified in the opening *Move 1* (see Appendix E).

Table 4.10 illustrates that cyclical step patterns (52.17%) occurred in similar percentages as linear step patterns (47.83%).

Table 4.10 Step patterns in *Move 1* used as the opening move of international medical journal corpus

Step pattern	No. of articles	Percentage (%)
Linear	**11**	**47.83**
Cyclical	**12**	**52.17**
Total	**23**	**100**

4.2.3 Move analysis model of international medical journal corpus

From the above data, the move analysis model of international medical research articles introductions is shown in Figure 4.4. The order of steps shown in the model is based on the frequency of occurrence and the order of steps in the corpus. *Move 1* and *Move 2* are obligatory, but *Move 3* is conventional. In *Move 1 Presenting background information, Step 2 Making topic generalization(s)* is obligatory while other steps are conventional. In *Move 2 Preparing for the present study*, only *Step 1 Indicating gap* is conventional whereas other steps are optional. Similarly, only *Step 1A Announcing present research* in *Move 3 Introducing the present study* is conventional.

Based on data in Table 4.8, 84% of the international medical journal corpus began with *Move 1*, had *Move 2* in the middle, and ended with *Move 3*. In this group, the pattern M1>M2>M1>M3, which recycled only *Move 1,* was found in 24% of the corpus. The patterns recycling both *Move 1* and *Move 2* (M1>M2>M1>M2>M3 and M1>M2>M1>M2>M1>M3) were found in the same percentage. An interesting point found in the corpus is that there are two patterns showing *Move 1* and *Move 3* recycling (M1>M3>M1>M2>M1>M3 and M1>M2>M1>M3>M1>M3). They were identified in 12% of the corpus. After *Move 3* in these patterns is *Move 1*. Thus, it is possible to have *Move 1* recycling after employing *Move 3* to increase specificity of information. As a normal arrow is used to indicate *Move 1* recycling after *Move 2*, which was found in 60% of the corpus, *Move 1* recycling after *Move 3* – which occurred less frequently (12%) – is marked with a dashed arrow in this model.

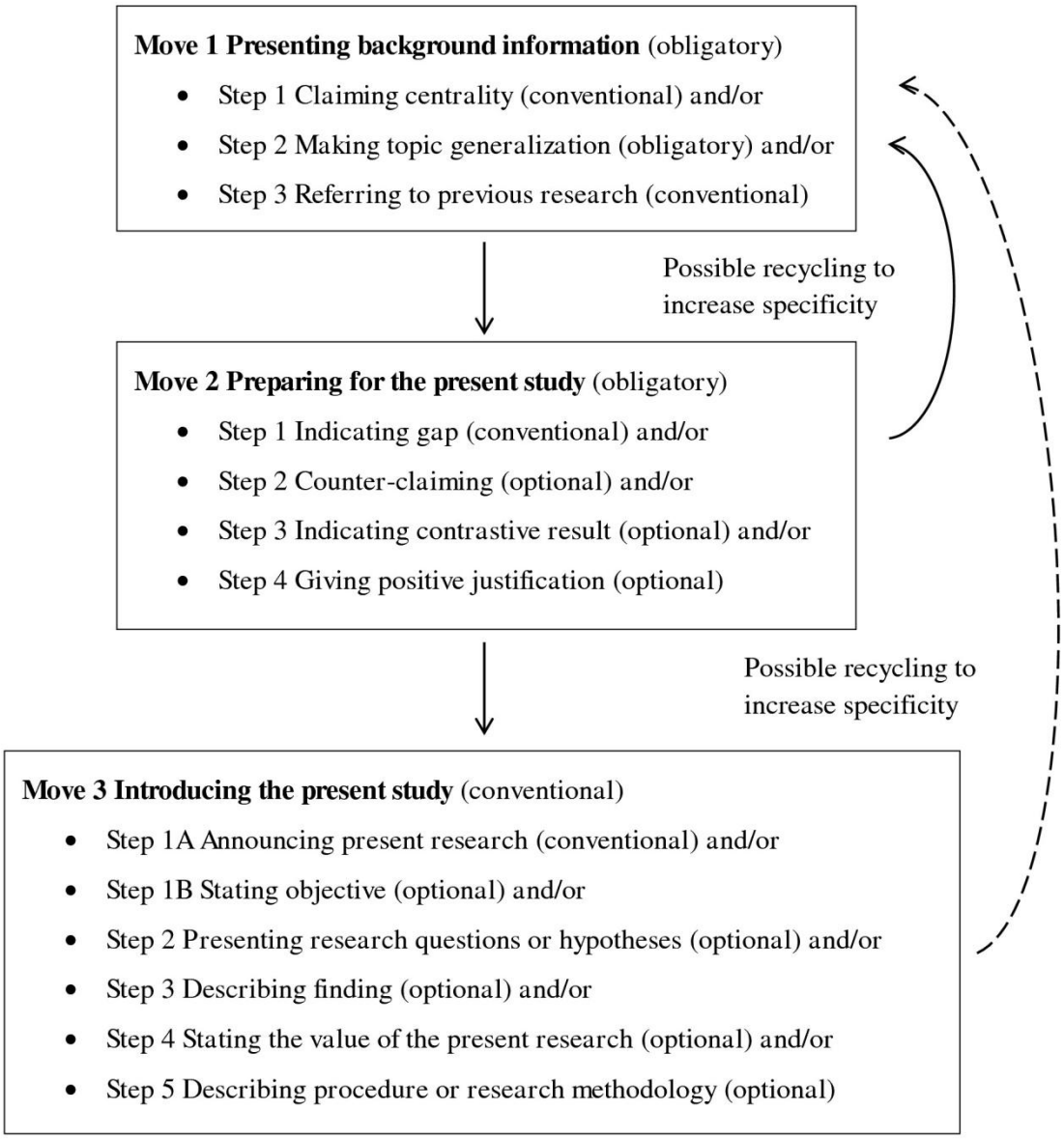


Figure 4.4 Move analysis model of the Introduction section in international medical journal corpus

4.3 Similarities and differences in the moves and steps between English medical research article introductions published in Thai and international medical journals

4.3.1 Move and step occurrences

4.3.1.1 Move occurrences

Move 1 Presenting background information was employed in the highest percentage (100%), and it is regarded as a obligatory move in both corpora (Figure 4.5). This demonstrates the importance of *Move 1*. *Move 2 Preparing for the present study* is obligatory in the international corpus, but it is conventional in the Thai corpus. On the contrary, *Move 3 Introducing the present study* is obligatory in the Thai corpus, but it is conventional in the international corpus. This shows the differences in the focus of move use in the corpora.

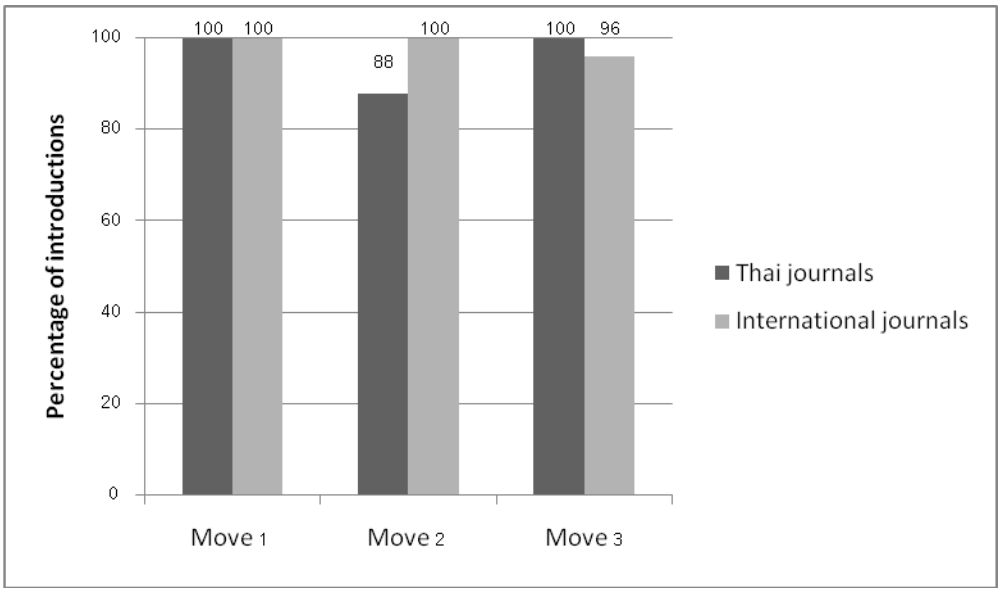


Figure 4.5 Comparison of frequency of occurrence of three moves in Thai and international medical journal corpora

4.3.1.2 Step occurrences

The comparison of all steps in the three moves of the two corpora is shown in Table 4.11. The similarities and differences of the steps are described in this section, move-by-move.

From Figure 4.6, we can see that, in *Move 1 Presenting background information, Step B Making topic generalization(s)* is obligatory in both corpora. *Step A Claiming centrality* receives more importance in Thai journals (obligatory) than international journals (conventional). *Step 3 Referring to previous research* is also required in both corpora, but it is given lesser importance and regarded as a conventional step (72% and 84%).

Table 4.11 Frequency of occurrence of moves and steps in the two corpora

Move/Step	Thai journals (%)	International journals (%)
Move 1 Presenting background information	**100**	**100**
• *Step A Claiming centrality*	100	96
• *Step B Making topic generalization(s)*	100	100
• *Step C Referring to previous research*	72	84
Move 2 Preparing for the present study	**88**	**100**
• *Step A Indicating gap*	44	68
• *Step B Giving positive justification*	32	12
• *Step C Indicating contrastive result*	28	28
• *Step D Counter-claiming*	8	40
Move 3 Introducing the present study	**100**	**96**
• *Step A Stating objective*	80	40
• *Step B Announcing present research*	20	80
• *Step C Presenting research questions or hypotheses*	16	12
• *Step D Describing procedure or research methodology*	4	4
• *Step E Describing findings*	4	12
• *Step F Stating the value of the present research*	8	12

For *Move 2 Preparing for the present study*, the writers of Thai journals focus on using *Step A Indicating gap, Step B Giving positive justification,* and *Step C Indicating contrastive result*, while the writers of international journals stress the use of *Step A Indicating gap* and *Step D Counter-claiming* (Figure 4.7).

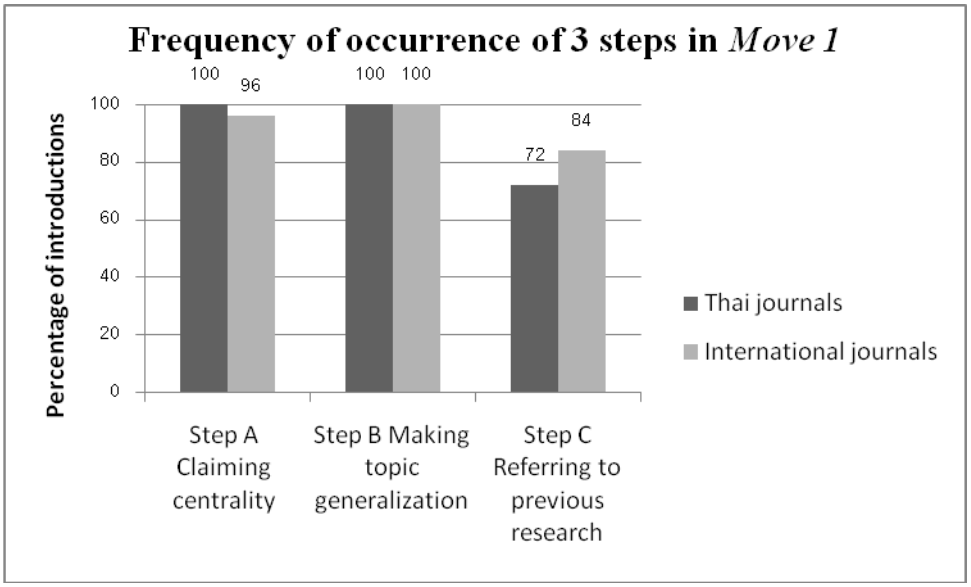


Figure 4.6 Comparison of frequency of occurrence of three steps in *Move 1 Presenting background information* in the two corpora

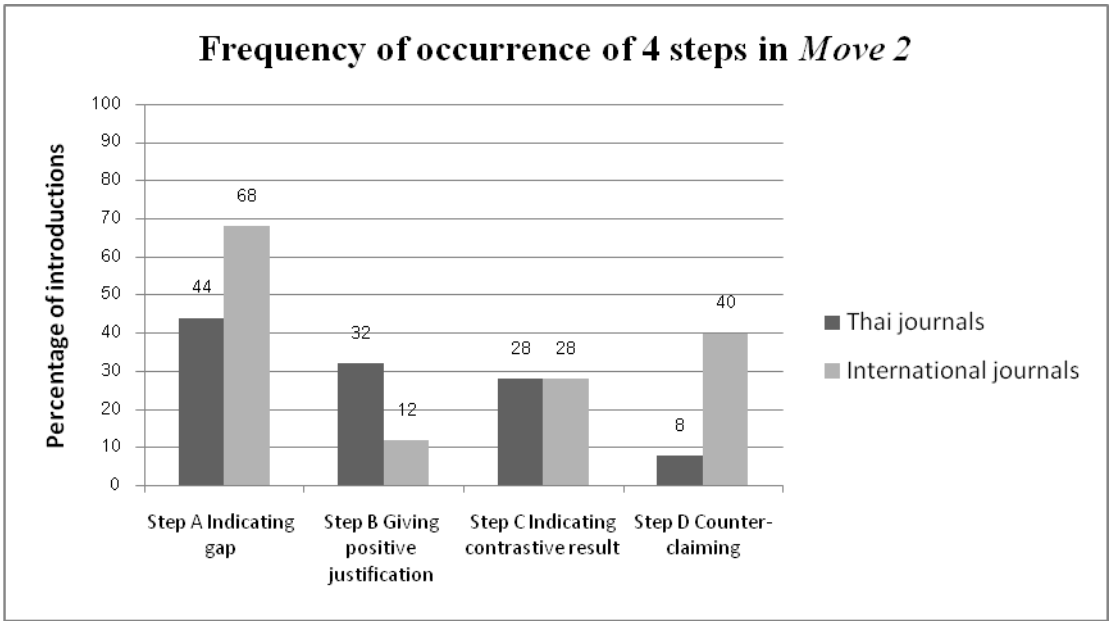


Figure 4.7 Comparison of frequency of occurrence of four steps in *Move 2 Preparing for the present study* in the two corpora

For the Thai journal corpus, *Step A Indicating gap, Step B Giving positive justification*, and *Step C Indicating contrastive result* were found in similar percentages (44%, 32% and 28%, respectively). *Step B Giving positive justification* was found in the Thai medical journals substantially more than in the international journals (32% vs. 12%),

while *Step A* and *Step C* were found in the Thai corpus less than in the international corpus. Some examples of *Step B* are shown below.

> *Therefore, a new strategy to improve the rate and quality of response before transplant should be beneficial in all myeloma patients.*
>
> (*Step B Giving positive justification* of *Move 2,* I4)

> *The significance of PR status has been studied to determine its predictive role in breast cancer treatment [R6] and its role as a prognostic factor [R5,7].*
>
> (*Step B Giving positive justification* of *Move 2,* I13)

For the international journals, *Step A Indicating gap* and *Step D Counter-claiming,* which are considered negative, were found quite often in this corpus. This is evidence that criticising by indicating gaps or claiming weak points of other studies is crucial for publishing in international medical journals, a highly competitive context. Some examples of *Step A Indicating gap* and *Step D Counter-claiming* are shown below.

> *Both active forms of vitamin D and standard supplemental vitamin D have been suggested to prevent falls among older individuals, but no direct comparison of these two groups is available.*
>
> (*Step A Indicating gap* of *Move 2,* I10)

> *It is not known, however, whether CETP inhibition attenuates atherosclerosis in humans.*
>
> (*Step A Indicating gap* of *Move 2,* I13)

> *However, these studies were limited by small sample size, inadequate adjustment for confounding, brief follow-up duration, and absence of information on patient adherence.*
>
> (*Step D Counter-claiming* of *Move 2,* I2)

> *Much of the current understanding of PVE has been based on studies limited by small sample size, retrospective design, or single-center experiences, and many of these investigations antedated the routine use of echocardiography in the diagnosis of IE and the contemporary and validated Duke diagnostic criteria for IE [R16, 17].*
>
> (*Step D Counter-claiming* of *Move 2,* I23)

In *Move 3 Introducing the present study*, the most striking steps are *Step A Stating objective* and *Step B Announcing present research* (Figure 4.8). The writers of Thai and

international medical journals focus on different steps. *Step A Stating objective* is given great importance in the Thai journals (80% of the Thai corpus), while *Step B Announcing present research* (80% of the international corpus) is more dominant in international medical journals. The rest of the steps in this move are optional and are not given as much importance as *Step A* and *Step B.*

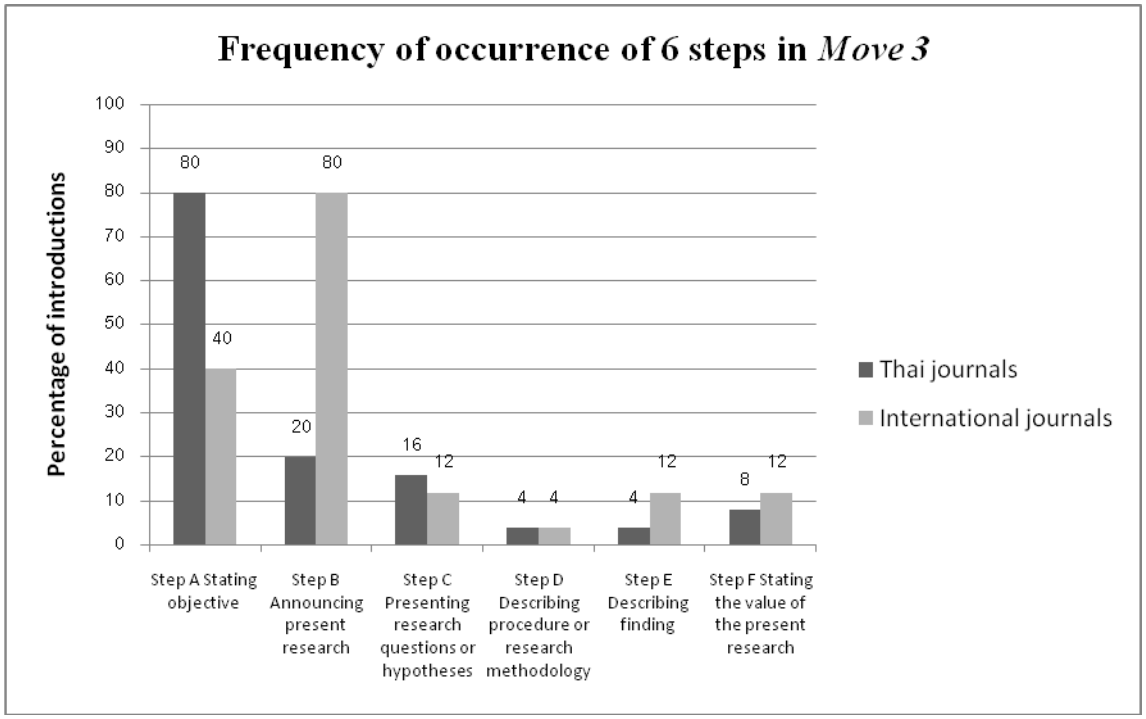


Figure 4.8 Comparison of frequency of occurrence of six steps in *Move 3 Introducing the present study* in the two corpora

Below are some examples of *Step A*, in which the writers of Thai journals are likely to state an objective of their research explicitly in *Move 3*.

> *Therefore, this study aims to determine the frequencies of CYP2C9 polymorphisms in Thai people and functional effects of CYP2C9 genotype in responsible for warfarin dosage.*
>
> (*Step A Stating objective* of *Move 3*, I2)

> *The purpose of this investigation was to study the effects of rifampicin and ketoconazole on the pharmacokinetics of a single oral dose of DEC in healthy volunteers.*
>
> (*Step A Stating objective* of *Move 3*, I18)

For the international journals, the authors tend to announce their research *(Step B)* by describing what they set out to do or what their research provides, instead of directly stating the purpose of a study as in *Step A.*

> *We undertook a large-scale, multi-year, population-based cohort study with a comprehensive analysis of sepsis, propensity-based matching to minimise confounding, and tracer analyses to assess the specificity of the findings.*
>
> (*Step B Announcing present research* of *Move 3*, I2)

> *This report provides information on prostate-cancer incidence, staging, and mortality in both study groups during the first 7 to 10 years of the study.*
>
> (*Step B Announcing present research* of *Move 3*, I15)

4.3.2 Patterns of moves and steps

In terms of move cyclicity, the introductions in the international medical journal corpus (76%) show cyclical patterns more often than those of the Thai medical journal corpus (48%) (Figure 4.9). The finding confirms the feature of move recycling in Swales's 2004 revised CARS model. Additionally, the introductions from international journals are more consistent with this model because the revised CARS model was developed based on research articles in international journals. On the contrary, half of the introductions from Thai journals still employ a linear move pattern as in Swales's 1990 model.

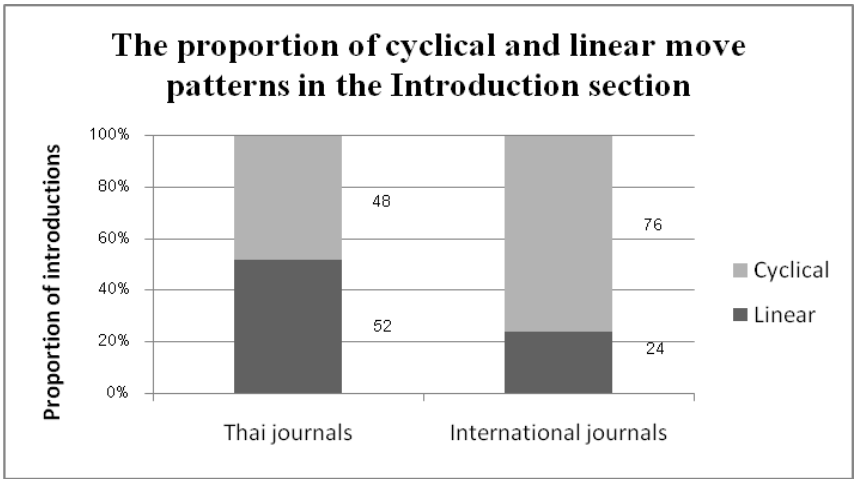


Figure 4.9 Comparison of proportion of cyclical and linear move patterns in the Introduction section in the two corpora

Although the introductions in Thai journals were written in a cyclical move pattern less often than those of international journals, the findings were different in terms of step patterns. As mentioned in 4.1.2, this study focuses on step patterns found in *Move 1*. The step patterns identified from *Move 1* used as the opening move tend to be more cyclical in the Thai journal corpus, as shown in Figure 4.10.

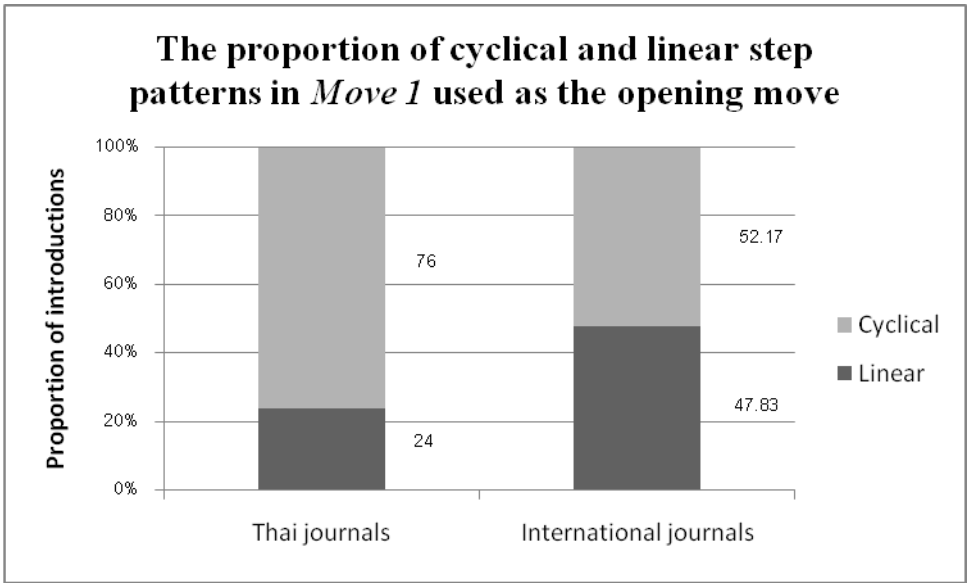


Figure 4.10 Comparison of proportion of cyclical and linear step patterns in *Move 1* used as the opening move in the two corpora

The findings imply that the introductions in international journals are more cyclical at the move level, whereas the introductions in Thai journals are more cyclical at the step level.

4.3.3 Sequence of moves

In this study, the sequence of moves is described in terms of the opening move and the closing move.

4.3.3.1 Opening move

It is apparent that *Move 1 Presenting background information* was used as the opening move in both corpora (Figure 4.11). However, 8% of the introductions in the international journals began with *Move 2 Preparing for the present study*. The examples below show the use of *Move 2* as the opening move in the first sentence of the introductions.

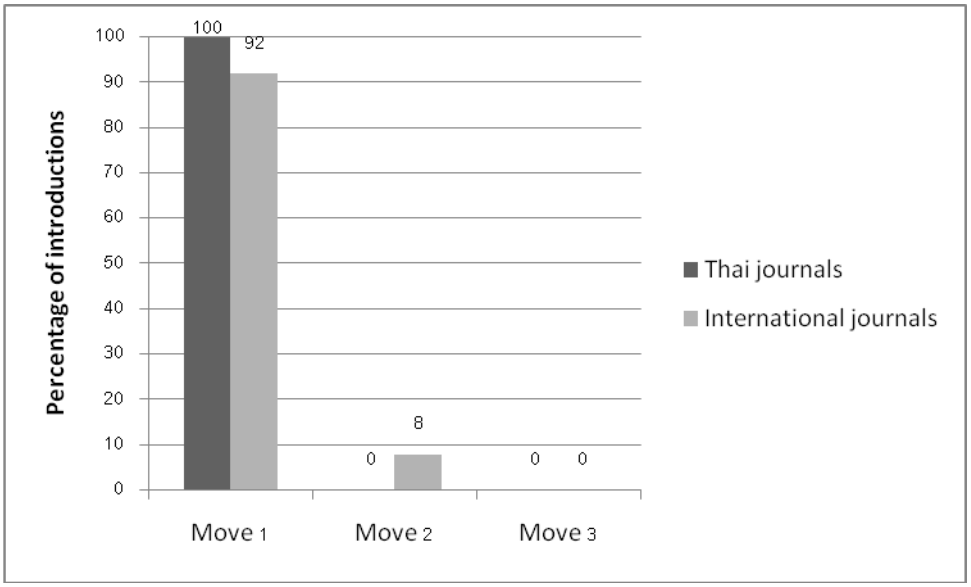


Figure 4.11 Comparison of the opening moves in the two corpora

In the decades after Jerome Conn's initial description of the condition [R1], the prevalence of primary hyper aldosteronism — increased aldosterone secretion from the adrenal glands — has remained an unresolved issue [R2,3].

(*Step A Indicating gap* of *Move 2*, I4)

The benefit of screening for prostate cancer with serum prostate-specific-antigen (PSA) testing, digital rectal examination, or any other screening test is unknown.

(*Step A Indicating gap* of *Move 2*, I4)

This variation of the opening move may suggest that it is acceptable to use moves other than *Move 1*as the opening move if it is logical and suited to the research topic.

4.3.3.2 Closing move

For the closing move, *Move 3 Introducing the present study* was most often used in both Thai journals and international journals, as expected (Figure 4.12). However, there are some variations between the two corpora. Eight percent of international journals employed *Move 1 Presenting background information* as the closing move, and 4% of Thai journals employed *Move 2 Preparing for the present study* as the closing move.

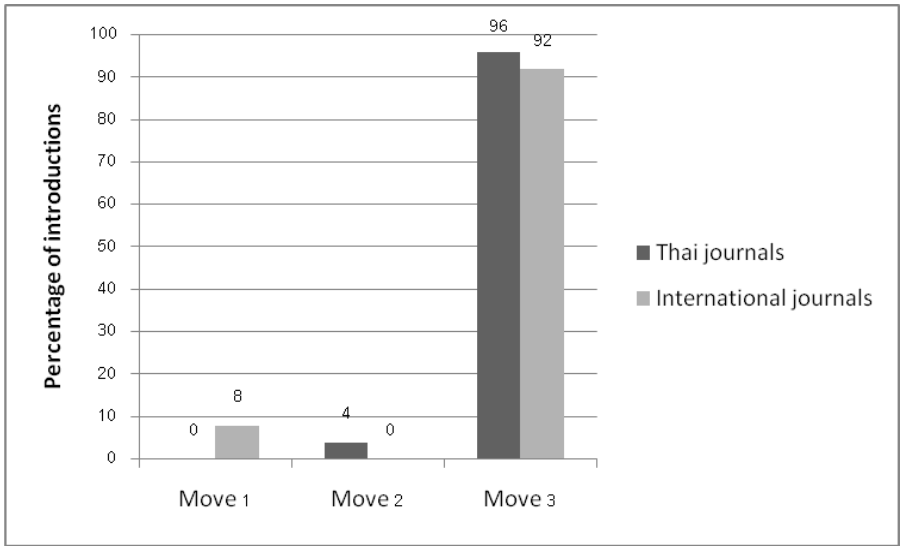


Figure 4.12 Comparison of the closing moves in the two corpora

The examples below show the use of *Move 1* and *Move 2* as the closing move.

> *Gatifloxacin is a quinolone antibiotic with bactericidal activity against C. pneumoniae and has been shown to prevent atherosclerosis in an animal model [R19].*
>
> (*Step C Referring to previous research* of *Move 1*, I11)

> *This exercise can improve body functional ability, enhance flexibility, strength, the tolerance of muscle and joints, improve mobility and blood circulation of the flexed and extended muscles and joints, and can rejuvenate the mind and body as a whole. [R4] This exercise program can be practiced in a group, which can help them to relieve loneliness by having interrelationship with each other. On the other hand, the elders can make a good social contribution by means of this exercise to promote their self health care; this includes the enhancement of their quality of life and happiness in the remaining time of their life with a minimum burden to their caregiver, family, and community and to the nation as a whole.*
>
> (*Step B Giving positive justification* of *Move* 2,T21)

4.3.4 Move analysis model

The move analysis models of the Introduction section in Thai journals (Figure 4.2) and international journals (Figure 4.4) are combined in Figure 4.13 for comparison. We can see that the macrostructures of these two models are similar, but there are some differences in their steps.

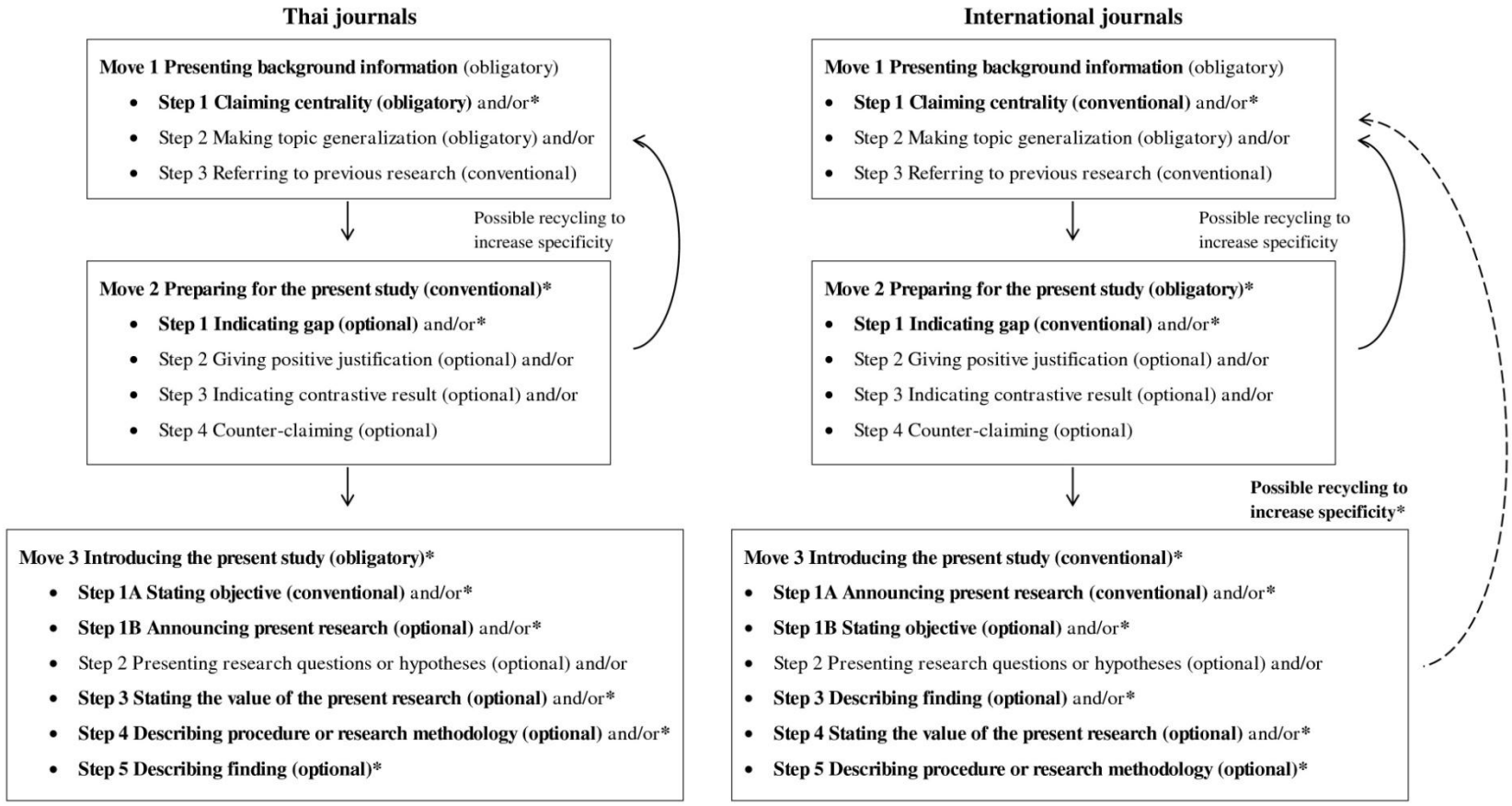


Figure 4.13 Comparison of move analysis models from the two corpora

Move 1 Presenting background information, in both Thai and international journal corpora, is obligatory. All steps in this move are usually employed. Some steps are obligatory, and some are conventional.

Move 2 Preparing for the present study shows several differences. This move is obligatory in the international corpus, but it is conventional in the Thai corpus. Moreover, the focus in the use of steps differs in the two corpora. The authors of Thai journals stress the employment of *Step A Indicating gap, Step B Giving positive justification*, and *Step C Indicating contrastive result*, while the writers of international journals emphasize the use of *Step A Indicating gap* and *Step D Counter-claiming*. Moreover, in the Thai journal corpus, all four steps in this move are optional, while *Step 1 Indicating gap* is, notably, a conventional step in the international corpus.

Unlike *Move 2*, *Move 3 Introducing the present study* is an obligatory move in the Thai corpus, but it is a conventional move in the international corpus. Additionally, the authors of these two types of journals focus on different steps. The writers of Thai medical journals primarily focus on *Stating objective*, while the authors of international medical journals focus mainly on *Announcing present research*. Other steps are optional.

In terms of move patterns, the introductions in the international journals are commonly cyclical, while the introductions in the Thai journals tend to be more linear.

Regarding move recycling, as mentioned in 4.1.3 and 4.2.3, it is possible to have *Move 1* recycling after *Move 2* employment in the Thai journals model. However, in the international journals model, *Move 1 recycling* after *Move 3* is also possible. This indicates the more cyclical move patterns in the international medical journal corpus.

4.4 Summary

To sum up, in the Thai medical journal corpus and the international medical journal corpus, three moves in the analytical model were identified. Three steps were identified in *Move 1 Presenting background information*, four steps were identified in *Move 2 Preparing for the present study*, and six steps were identified in *Move 3 Introducing the present study* of the two corpora. The features of each corpus in terms of frequency of occurrence and patterns of moves and steps were described. In addition, the move

analysis was proposed. Lastly, the findings from both corpora were compared in terms of move and step occurrences, patterns of moves and steps, sequence of moves, and move analysis model. The next section will present the discussion and the implications derived from these findings.

CHAPTER 5 DISCUSSION AND IMPLICATIONS

The previous chapters presented the findings of Research Questions 1, 2 and 3. This chapter aims to discuss the main findings and suggest implications arising from conducting this research study. The information will be presented as follows:

5.1 Summary of the findings
    5.1.1 Move occurrence
    5.1.2 Step occurrence
    5.1.3 Move patterns
5.2 Pedagogical implications
5.3 Suggestions for further studies
5.4 Conclusion

5.1 Summary of the findings

The main purpose of this study was to compare the moves and steps of the Introduction section in medical research articles published in Thai journals with those in international journals. The similarities and differences of these two corpora were discussed under three topics: move occurrence, step occurrence and move patterns.

5.1.1 Move occurrence

From the results in Table 4.11, it was found that the number of moves and steps identified in both corpora are the same. There were three moves in the Introduction section: *Move 1 Presenting background information, Move 2 Preparing for the present study* and *Move 3 Introducing the present study*.

All three moves in both corpora are required for the Introduction section, as they are either obligatory (100%) or conventional (60-99%). None of them is optional. This supports the findings from the move analyses by Kanoksilapatham (2007), Loi (2010), Sheldon (2011), and Amnuai and Wannaruk (2013). Thus, these three moves are crucially important in the Introduction section. *Move 1 Presenting background information* is the most essential move, as it is considered obligatory in both corpora.

From these findings, the perceptions of the macrostructures of writers whether in Thai or international journals are similar in that an introduction of a medical research article should have three moves: *Move 1 Presenting background information*, *Move 2 Preparing for the present study*, and *Move 3 Introducing the present study*.

5.1.2 Step occurrence

In *Move 1 Presenting background information*, there were three steps: *Step A Claiming centrality, Step B Making topic generalization(s)* and *Step C Referring to previous research*. Four steps in *Move 2 Preparing for the present study* include *Step A Indicating gap, Step B Giving positive justification, Step C Indicating contrastive result,* and *Step D Counter-claiming*. *Move 3 Introducing the present study* has six steps: *Step A Stating objective, Step B Announcing present research, Step C Presenting research questions or hypotheses, Step D Describing procedure or research methodology, Step E Describing finding,* and *Step F Stating the value of the present research.*

Regarding the step occurrence, in *Move 1 Presenting background information,* there are some similarities. First, *Step B Making topic generalization(s)* is very important in both Thai and international journals as it is an obligatory step. Second, *Step C Referring to previous research* is given less importance as it is a conventional step with relatively low frequencies in both corpora, compared with other steps in this move. However, the authors of Thai journals (72%) did not employ this step as much as those of international journals (84%). Referring to previous studies shows the researcher's awareness and knowledge in the related field. To publish in international journals, this step could be more necessary. For the difference between two corpora, the authors of Thai journals focus on *Step A Claiming centrality* more than those of international journals (making it an obligatory step and a conventional step, respectively).

Another interesting issue is the step employment in *Move 2 Preparing for the present study*. As mentioned earlier, some authors of Thai journals were likely to omit this move. All four steps in this move are only optional in the Thai corpus, whereas *Step A Indicating gap* is conventional in the international corpus. It is seemingly considered necessary to indicate gaps in the Introduction section of a research article submitted to an international journal.

The authors of Thai journals and international journals focus on different steps when writing *Move 2*. The authors of Thai journals focus on using *Step A Indicating gap, Step B Giving positive justification*, and *Step C Indicating contrastive result*, while the authors of international journals stress the use of *Step A Indicating gap* and *Step D Counter-claiming*. The greater employment of *Step A Indicating gap* (68%) and *Step D Counter-claiming* (40%) in the international corpus suggests that the writers of international journals prefer writing about other research studies by criticising them, while the authors of Thai journals tend to use *Step B Giving positive justification* (32%) in similar percentages as *Step A Indicating gap* (44%) and *Step C Indicating contrastive* (28%). *Step B* can be seen as an alternative strategy for Thai researchers. As the authors of Thai journals tend to avoid criticising other studies, they choose to write about other studies in a positive way instead. Additionally, *Step B Giving positive justification* was used in 32% of the Thai corpus, while it was used in 12% of the international corpus. The Western world's attitude towards criticism seems to be regarded as inappropriate among Thai researchers (Kanoksilapatham, 2007; Amnuai and Wannaruk, 2013). These findings confirm the influence of culture in writing.

In *Move 3 Introducing the present study*, the main difference between the two corpora is that the authors of Thai journals tend to use *Step A Stating objective*, and the authors of international journals tend to use *Step B Announcing present research*. This indicates that the writers of Thai journals prefer to state the research purpose directly rather than describe what they set out to do, whereas the authors of international journals tend to use *Step B Announcing present research.* The intense competition for international publication may be the reason for these step differences. It may be acceptable to write in a direct way, using expressions such as "This study aims to…", and "The objective of this research is…". However, describing the present research with essential information packed into one sentence seems more appropriate to persuade the reviewers and readers of international journals. The example below illustrates this phenomenon.

> *We undertook a large-scale, multi-year, population-based cohort study with a comprehensive analysis of sepsis, propensity-based matching to minimise confounding, and tracer analyses to assess the specificity of the findings.*
>
> (*Step B Announcing present research* of *Move 3*, I2)

The above findings show that if the authors of Thai journals cannot critically point out the need of their research area in *Move 2*, as they tend to avoid *Step A Indicating gap* and *Step D Counter-claiming*, what they write in *Move 3* will be made direct and superficial by plainly stating their objective.

When writing a research article to publish in an international journal, a writer should be critical-minded. The author is required to directly criticize other researchers' work by using *Step A Indicating gap* and *Step D Counter-claiming* in *Move 2*, so the arguments in this move are clear. When the author shifts to *Move 3 Introducing the present study*, the author can explicitly state what they set out to do by using *Step B Announcing present research*. All these strategies have proven successful in persuading the audience to agree that the present research is worth investigating.

5.1.3 Move patterns

Most of the research article introductions in both corpora start with *Move 1 Presenting background information*, end with *Move 3 Introducing the present study*, and have *Move 2 Preparing for the present study* somewhere between these moves (M1>M2>M3 with possible move recycling). This is consistent with Swales's 2004 CARS model. The move analysis models of the two corpora are shown in Figure 4.13.

The most striking difference of the move patterns between the two corpora is that the introductions in the international corpus are clearly more cyclical, while those of the Thai corpus tend to be linear (Figure 4.9). This finding is consistent with the results from the comparative move analysis by Loi (2010). There is a higher degree of cyclicity of moves in English introductions than in Chinese introductions. Although the authors of Thai journals used the linear pattern (52%) in a little higher percentage compared to the cyclical pattern (48%), this shows that authors of Thai medical journals may feel that these two strategies, writing in linear and cyclical patterns, are practically equivalent.

Among the three moves, *Move 1 Presenting background information* is the most recycled move (see Tables 4.3 and 4.8). This supports the findings from Amnuai and Wannaruk's study (2013). This suggests that providing background information of the research field is essential in international journals, so *Move 1* is repeatedly employed with increasing specificity of data.

An interesting issue found within the cyclical group of the Thai corpus is that there was a higher percentage of step recycling in *Move 1* used as the opening move than that of the international corpus (76% vs. 52.17%). This implied that the authors of Thai journals tend to recycle steps (microstructure) within a move, whereas the authors of international journals are likely to recycle moves (macrostructure). A diagram of cyclical patterns at different level in the Thai corpus and the international corpus is shown in Figure 5.1.

Move recycling helps the writers of international journals introduce their study more deeply and helps their audience understand their present research step-by-step. The area of research is divided into sub-areas, and each time the writers provide background information in that sub-area, the need to investigate in that sub-area is also expressed. This strategy is also beneficial in that when the writers shift between the moves, the transition signals change, and this leads the audience to comprehend the stance of the authors. For example, when the audience see the words 'however' and 'although', they anticipate that there will be information about gaps, contrastive results or counter-claims.

For the authors of Thai journals, having step recycling within *Move 1* makes *Move 1* a long text segment, compared with other moves. The length of *Move 1* could exhaust the audience when reading their articles. Although the Introduction should be informative, it should be as short as possible with clarity (Zeiger, 1991). Thus, the authors of Thai journals should keep in mind that this strategy, which seems acceptable in local journals, may be inappropriate in international journals.

The closer look into the move cyclicity also led to the adaptation of the proposed move analysis model of the international corpus, as illustrated in Figure 4.13. There is a possibility of recycling *Move 1 Presenting background information* after the use of *Move 3 Introducing the present study*. This is an addition to Swales's 2004 revised CARS model, which has only *Move 1* recycling after *Move 2* employment.

In conclusion, all of these main findings allow us to better understand the similarities and differences of moves and steps in the Introduction sections between the Thai medical journal corpus and international medical journal corpus.

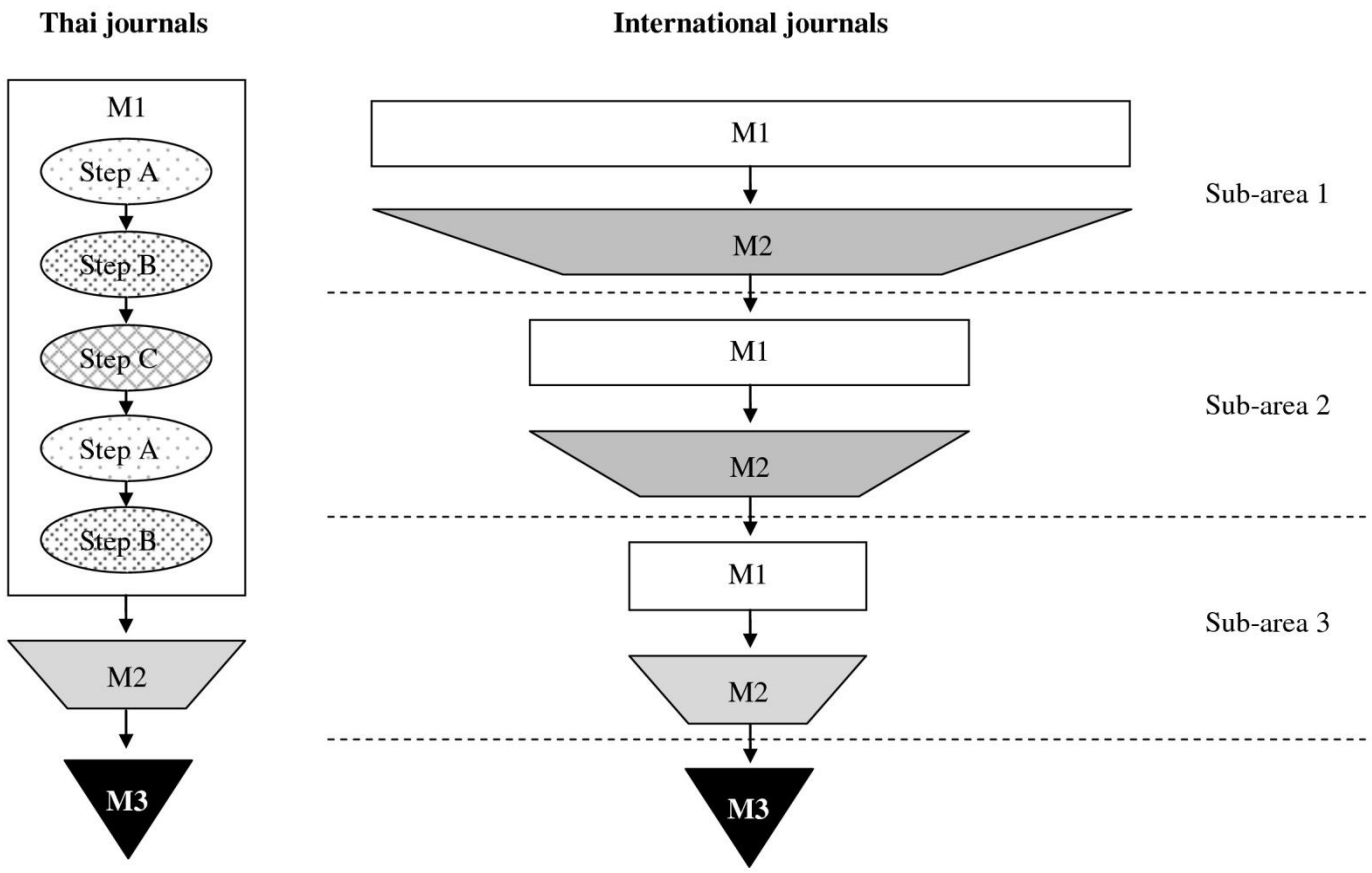


Figure 5.1 Diagram of cyclical patterns in Thai journals compared to international journals

5.2 Pedagogical implications

The results of this move analysis have pedagogical implications concerning English research writing.

Firstly, in teaching medical professionals to write the Introduction section of a research article, the main components should be stated: *Move 1 Presenting background information*, *Move 2 Preparing for the present study*, and *Move 3 Introducing the present study*. These moves are required in both corpora. Secondly, the concept of move patterns should be introduced. A teacher should describe the linear M1>M2>M3 pattern first, and then tell the students that move recycling can occur, resulting in cyclical patterns. Third, regarding the cyclical pattern, it is crucial to raise awareness of how to write introductions appropriate for different journals. To publish in a Thai journal, both step recycling (microstructure) and move recycling (macrostructure) are acceptable. However, to publish in an international journal, a writer should recycle the moves (macrostructure) as shown in Figure 5.1. This helps the writer introduce the topic deeply step-by-step, and, at the same time, in an audience-friendly way.

Furthermore, step preferences should also be taught. A step serves as a focus differently in the two corpora, especially in *Move 2 Preparing for the present study* and *Move 3 Introducing the present study*. For example, an introduction giving positive justification *(Step B)* in *Move 2 Preparing for the present study* may be appropriate for Thai journals. However, in the view of reviewers of international journals, this kind of introduction may not be as persuasive as other introductions indicating gaps and criticizing other research studies. Thus, the two strategies, *Step A Indicating gap* and *Step D Counter-claiming*, should be utilized when writing an article for international journals. This displays the author's critical thinking and emphasizes the need to conduct a study in the niche area.

In *Move 3 Introducing the present study*, *Stating objective* is acceptable in Thai journals, but authors should *announce the present research* if they aim to publish in international journals, because *Announcing present research* provides a clearer picture of what the researcher set out to do than *Stating objective.*

Finally, English for Specific Purposes (ESP) teachers may use the models and some expressions from the identified moves and steps to prepare their research writing

lessons. According to Crane (2006), knowledge of both genre and generic structure is a useful teaching resource for developing reading and writing skills of L1 and L2 learners. Genre structure reflects the beliefs and norms of the discourse community. This may be problematic for newcomers in the field, such as medical students or novice researchers. Thus, applying the generic structure of the Introduction section from this study into the lessons, in the form of contents and exercises, would facilitate learner's comprehension and production to achieve communicative goals.

5.3 Suggestions for further studies

This study has shed some light on the generic organization of the Introduction section of medical research articles published in Thai journals and international journals. Nevertheless, there are some suggestions for future research.

First, future studies might compare moves and steps in entire research articles, including the Methods, Results, and Discussion sections. This would provide a broader perspective of how medical research articles are written. It would be useful if we could understand all the components in every section of a research article, and the results from the move analysis could be applied to teaching for an entire research paper, not limited to an Introduction.

Second, it would be interesting to explore issues relating to the differences between the two corpora. These issues include native language, educational background (studying in an international school or training abroad), language improvement (learning English courses or consulting language specialists), and publishing experience. For example, future research may compare the rhetoric organization of research articles in international journals written by Thai authors and native English authors to see whether the language of authors affects writing patterns.

Third, an expansion might be done through exploring linguistic features in each move and step. After move and step identification, specific linguistic features, such as tenses, voices, relative clauses, and modifiers, might be analysed to reveal their distinct linguistic features. The results could also be used to support the description of moves and steps.

Finally, it would be beneficial to investigate the rhetorical structure in other genres of the medical field, both written and spoken genres. For instance, future move analyses may be done in case reports, grant proposals, ward round discussions and conference presentations. This would provide comprehensive understanding of the rhetorical organization of the medical discourse community.

5.4 Conclusion

The results of this study show that the introductions of research articles in Thai medical journals and international journals share some similarities, but differ to some degree. Although the move analysis models of these two kinds of journals are consistent with the three-move models of Swales (1990, 2004), there are some disparities that illustrate the influence of culture and context upon the rhetorical organization, and these differences should be addressed in the process of writing a research article.

One final caveat is that Thai doctors should be aware of the differences in the rhetorical organization of different target journals. Thai physicians and medical researchers work hard in conducting research, and several high-impact studies have been accomplished. However, the number of publications is not satisfactory. The problem is not about the production, but it is about presenting the research in the proper form for publication. Research starts from previous studies, and when the new research is finished, its results should be published to extend knowledge in the field. Nowadays, in this globalized world, any researchers can stay local, yet go global in their research field. The norms of writing for Thai journals should not be a factor that hinders the opportunity of Thai researchers to publish internationally. Thus, the knowledge of structural organization of a research article would be an effective solution to the problem of disseminating research to international journals.

Hopefully, the findings from this research will prove valuable for medical researchers who want to comprehend how to write an Introduction section appropriate for their target journals, for linguistic researchers who are interested in move analysis, and for ESP instructors who teach research writing.

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