COMPARATIVE ANALYSIS OF MOVE-STEP STRUCTURES OF ENGLISH MEDICAL SCIENCE RESEARCH ARTICLES WRITTEN BY CHINESE RESEARCHERS BETWEEN HIGH AND LOW IMPACT FACTOR JOURNALS

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A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Arts in English Language Studies

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การวิเคราะห์เชิงเปรียบเทียบโครงสร้างอัตถภาคของบทความวิจัยสาขาวิทยาศาสตร์การแพทย์ที่เขียนโดยนักวิจัยชาวจีนระหว่างวารสารที่มีดัชนีผลกระทบการอ้างอิงสูงและต่ำ

นางสาวแหยนหลิง เมิ่ง

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาศิลปศาสตรมหาบัณฑิต
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แหยนหลิง เมิ่ง : การวิเคราะห์เชิงเปรียบเทียบโครงสร้างอัตถภาคของบทความวิจัยสาขาวิทยาศาสตร์การแพทย์ที่เขียนโดยนักวิจัยชาวจีนระหว่างวารสารที่มีดัชนีผลกระทบการอ้างอิงสูงและต่ำ (COMPARATIVE ANALYSIS OF MOVE-STEP STRUCTURES OF ENGLISH MEDICAL SCIENCE RESEARCH ARTICLES WRITTEN BY CHINESE RESEARCHERS BETWEEN HIGH AND LOW IMPACT FACTOR JOURNALS) อาจารย์ที่ปรึกษา : ผู้ช่วยศาสตราจารย์ ดร.อิศรา ประมูลศุข, 187 หน้า

ในช่วงไม่กี่ปีที่ผ่านมา บทความวิจัยภาษาอังกฤษสาขาวิทยาศาสตร์การแพทย์มีบทบาทสำคัญในการก้าวหน้าของความรู้ทางวิทยาศาสตร์การแพทย์ในหมู่นักวิชาการทั่วโลก นักวิจัยสาขาวิทยาศาสตร์การแพทย์รุ่นใหม่มีความยากลำบากมากเกี่ยวกับการเขียนงานประเภทนี้ อย่างไรก็ตามจนถึงทุกวันนี้ยังไม่มีงานวิจัยใดที่ทำเกี่ยวกับการวิเคราะห์ บทคัดย่อ บทนำ วิธีการทดลอง ผลการทดลอง และการอภิปรายผลของบทความวิจัยสาขาวิทยาศาสตร์การแพทย์ที่เขียนโดยนักวิจัยชาวจีนอย่างสมบูรณ์ และยิ่งไปกว่านั้น ความแตกต่างของโครงสร้างอัตถภาคในบทความวิจัยสาขาวิทยาศาสตร์การแพทย์ภาษาอังกฤษที่เผยแพร่ในวารสารที่มีดัชนีผลกระทบการอ้างอิงสูงและวารสารที่มีดัชนีผลกระทบอ้างอิงต่ำยังไม่เป็นที่รับรู้ ดังนั้น งานวิจัยนี้มุ่งหมายที่จะศึกษาโครงสร้างอัตถภาคของบทคัดย่อ บทนำ วิธีการทดลอง ผลการทดลอง และการอภิปรายผลในบทความวิจัยสาขาวิทยาศาสตร์การแพทย์ที่เขียนโดยนักวิจัยชาวจีนที่มหาวิทยาลัยการแพทย์ซุนยี่ที่เผยแพร่ในวารสารที่มีดัชนีผลกระทบการอ้างอิงสูงและวารสารที่มีดัชนีผลกระทบอ้างอิงต่ำเป็นประการที่หนึ่ง ประการที่สอง เพื่อศึกษาความแตกต่างของส่วนประกอบเหล่านั้นในบทความวิจัยสาขาวิทยาศาสตร์การแพทย์ระหว่างวารสารที่มีดัชนีผลกระทบการอ้างอิงสูงและวารสารที่มีดัชนีผลกระทบอ้างอิงต่ำ การศึกษาวิเคราะห์บทความวิจัยสาขาวิทยาศาสตร์การแพทย์ที่เขียนโดยนักวิจัยชาวจีนที่มหาวิทยาลัยการแพทย์ซุนยี่ จากปี 2550 ถึง 2558 จำนวน 30 ฉบับ ที่เลือกมาสร้างเป็นกลุ่มข้อมูลเป้าหมายของงานวิจัยนี้ โดยแบ่งเป็นบทความวิจัย 15 ฉบับที่เผยแพร่ในวารสารที่มีดัชนีผลกระทบการอ้างอิงสูง และบทความวิจัย 15 ฉบับในวารสารที่มีดัชนีผลกระทบอ้างอิงต่ำ โครงสร้างอัตถภาคที่เสนอโดยแอนเดอร์สันและแมคลีน (1997) ได้นำมาใช้สำหรับการวิเคราะห์โครงสร้างอัตถภาคบทคัดย่อ และโครงสร้างอัตถภาคที่เสนอโดย ดร.บุษบา กนกศิลปะธรรม (2005) ได้นำมาใช้วิเคราะห์บทนำ วิธีการทดลอง ผลการทดลอง และการอภิปรายผล ผลการวิจัยแสดงให้เห็นว่ามีโครงสร้างของข้อมูลพื้นฐาน วัตถุประสงค์ วิธีการทดลอง การทดลอง และการสรุปผลการทดลองที่พบบ่อยในบทคัดย่อของทั้งสองกลุ่มข้อมูล และไม่มีความแตกต่างที่ชัดเจนในทั้งสองกลุ่มข้อมูล ยิ่งไปกว่านั้น โครงสร้างอัตถภาคแบบซ้อนกันบางประเภทถูกพบในบทคัดย่ออีกด้วย สำหรับบทนำ

วิธีการทดลอง และการอภิปรายผล มีทั้งหมด 16 อัตถภาคที่ถูกพบในทั้งสองกลุ่มข้อมูล อย่างไรก็ตามมีความแตกต่างที่ชัดเจนบางประเภทต่อความถี่อัตถภาคในบทนำ วิธีการทดลอง ผลการทดลอง และการอภิปรายผลของทั้งสองกลุ่มข้อมูล โดยสรุป ผลการทดลองของงานวิจัยนี้อาจจะเสนอข้อคิดเกี่ยวกับการสอนที่ใช้ได้จริงสำหรับนักวิจัยรุ่นใหม่และอาจารย์ในด้านวิทยาศาสตร์การแพทย์ และในตอนท้ายได้มีการอภิปรายถึงข้อจำกัดของงานวิจัยนี้ไว้ด้วย

สาขาวิชาภาษาต่างประเทศ ลายมือชื่อนักศึกษา _____

ปีการศึกษา 2559 ลายมือชื่ออาจารย์ที่ปรึกษา _____

YANLING MENG : COMPARATIVE ANALYSIS OF MOVE-STEP STRUCTURES OF ENGLISH MEDICAL SCIENCE RESEARCH ARTICLES WRITTEN BY CHINESE RESEARCHERS BETWEEN HIGH AND LOW IMPACT FACTOR JOURNALS.
THESIS ADVISOR : ASST. PROF. ISSRA PRAMOOLSOOK, Ph.D., 198 PP.

COMPARATIVE ANALYSIS/MOVE-STEP STRUCTURES ANALYSIS/ ENGLISH MEDICAL SCIENCE RESEARCH ARTICLES/IMPACT FACTOR

In recent years, medical science research articles (MSRAs) in English play the indispensable roles in advancing scientific knowledge of medical science among scholars worldwide. Novice medical science researchers have great difficulties with writing this genre. However, so far, there is no research that conducts the analysis of the complete Abstract (A), Introduction (I), Methods (M), Results (R) and Discussion (D) sections of the English MSRAs written by Chinese researchers published in international medical science journals and yet, the variations on the move-step structures in English MSRAs published in the high impact factor (HIF) journals and those in the low impact factor (LIF) journals remain unknown. Therefore, the present study aims to investigate 1) the moves, steps, and their structures of the Abstract, Introduction, Methods, Results, and Discussion in MSRAs written by Chinese researchers at Zunyi Medical University (ZMU) published in the HIF journals and the LIF journals, and 2) to investigate the variations of those elements of MSRAs between the HIF journals and the LIF journals. A total of 30 MSRAs written by Chinese researchers at ZMU published from 2007 to 2015 were selected to create the target

corpora of the present investigation, including 15 RAs published in the top highest impact factor journals and 15 RAs published in the bottom lowest impact factor journals. The frameworks of Anderson and Maclean's (1997) and Kanoksilapatham's (2005) were adopted for the move-step structure analysis of the Abstract and the IMRD sections, respectively. The results demonstrated that there were 5 moves of *Background* (*B*), *Purpose* (*P*), *Methods* (*M*), *Results* (*R*), and *Conclusion* (*C*) in the Abstract in both corpora. All the five moves were conventional moves in both corpora, and there was no distinctive difference between the two corpora. In addition, some move embedments were also found in the Abstract. For the IMRD sections, 16 moves were found in both corpora. However, some distinctive differences regarding the move frequency of the IMRD sections in the two corpora were revealed. In conclusion, the findings of the present study might propose practical pedagogical implications for both the novice medical science researchers and teachers, and finally the limitations of the present study were discussed.

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Student's Signature Jantong Mong

Advisor's Signature

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LIST OF ABBREVIATIONS

BM	=	Bachelor of Medicine
BMSS	=	Bachelor Medical Science Students
CARS	=	Create a Research Space
CLT	=	Communicative Language Teaching
CNKI	=	China National Knowledge Infrastructure
DM	=	Doctor of Medicine
DMC	=	Dalian Medical College
ELT	=	English Language Teaching
ENS	=	English Native Speaker
ESP	=	English for Specific Purposes
HIF	=	High Impact Factor
IF	=	Impact Factor
IMRD	=	Introduction-Methods-Results-Discussion
LIF	=	Low Impact Factor
M	=	Move
MM	=	Master of Medicine
MMSS	=	Master Medical Science Students
MOE	=	Ministry of Education

LIST OF ABBREVIATIONS (Continued)

MSRAs	=	Medical Science Research Articles
NNS	=	Non-native Speaker
NS	=	Native Speaker
RA	=	Research Article
S	=	Step
SFL	=	Systemic Functional Linguistics
ZMU	=	Zunyi Medical University

CHAPTER 1

INTRODUCTION

This chapter gives a brief introduction to the present study which aims to identify the moves, steps and their structures of the Abstract (A), Introduction (I), Methods (M), Results (R), and Discussion (D) sections in medical science research articles (MSRAs) written by Chinese researchers at Zunyi Medical University (ZMU). In addition, the researcher aims to identify the variations of move-step structures between MSRAs in high impact factor (HIF) journals and low impact factor (LIF) journals. The findings are expected to help novice researchers or student writers in ZMU write MSRAs effectively. It starts with the background of the study. Then, it presents the statement of problems, the rationale of the study, the purposes of the study, the research questions, the significance of the study, and the scope of the study. It will end with definitions of key terms in the present study.

1.1 Background to the Present Study

1.1.1 The Importance of English Language Teaching in China

As English rapidly develops more complex relationships between communities of speakers around the world (Sharifian, 2009), and as a result of the globalization, it plays an indispensable role in international communication.

Consequently, the global or international language status of English has been established (Crystal, 1997). In the last few decades, the spread and status of English have an unprecedented impact on the People's Republic of China. China is a big country with a population of over 1.3 billion and has 5000 years of civilizations. Cheng (2011) states that in 2003, China already had the largest English-learning population in the world. In 2010, the total number of people who had learned English reached about 400 million (Wei & Su, 2012). With the open-door policy that started in 1978, China has a fast development in economy, politics, and culture, which leads to its active participation in international affairs such as hosting the APEC meeting in 2001, Beijing Olympic Games in 2008, Shanghai and World Expo in 2010, and China's entry into the World Trade Organization. In order to increase the prestige and status of China, there is a need to contact with the outside world. There is no doubt that English is regarded to have a crucial role for China's modernization and development (Adamson & Morris, 1997). Due to the importance of English, there is definitely an increasing demand for English language teaching (ELT).

1.1.2 The Development of ELT in China

As stated previously, ELT is of great importance in China, thus, it is necessary to have a brief review of the history of ELT in China.

Wang (1986) points out that ELT in China actually was initiated by Chinese officials in the Qing Dynasty in 19th century. Since the open-door policy, ELT in China has gone through several stages. Zhang (2003) states that in 1978, English

became one of the test subjects on the National College Entrance Examination. In 2001, English was regarded as a compulsory and a main school subject in China, which was issued by the Ministry of Education (MOE, 2001).

According to Wang (2007), the development of ELT in China has gone through four major phases in the last two decades. The first phase is the Restoration Phase (1978-1985). During this phase, in 1980 MOE issued the first English Syllabus at tertiary level. This syllabus mainly focuses on the grammar teaching. The second phase is the Rapid Development Phase (1986-1992). During this period, there was a great reform in English language teaching in which Communicative Language Teaching (CLT) was introduced in the Chinese context (Hu, 2002). Thirdly, the Reform Phase (1993-2000) focused on the function of English. Meanwhile, MOE issued the new College English Teaching Syllabus in 1999, which aims to enhance students' practical ability in English communication. The last phase is the Innovation Phase (2000 onwards). In order to improve students' comprehensive English abilities: listening, speaking, reading, and writing, MOE issued College English Curriculum Requirements (Revision) in 2004. The College English Curriculum Requirements is drawn up to provide colleges and universities with the guideline for English instruction to non-English major students.

This section gives a brief introduction of ELT development in China. The following section will discuss ELT in university context, focusing on ELT for medical science majors in ZMU.

1.1.3 ELT in Universities in China

ELT in China at the tertiary level is divided into two separate sections: English education for English majors and for non-English majors. The college English is for the non-English major students, all of whom are required to take a general English course for two years (Luo, 2007). There is a huge population of non-English major students enrolling in English courses each year. These students major in a variety of disciplines such as medical science, engineering, business, management and so on.

For all universities, non-English major students are required to take English courses for two years. During the two years, they need to take English courses for around 240 teaching hours (Li, 2010). In addition, in order to improve the effectiveness of teaching and learning, they are required to take a nationwide, standardized English proficiency test termed College English Test Band 4 (CET-4). Passing CET-4 is the basic requirement for bachelor students to get their degree, and CET-4 is normally taken at the end of each term (there are two terms a year in China). Besides, after passing CET-4, they are expected to take College English Test Band 6 (CET-6) which is better for them to get a good job in the future.

In order to improve students' communicative competence, in 1999 the MOE adjusted the curriculum. This curriculum focuses on the student-centered teaching approach instead of teacher-centered approach. On the other hand, the English major students are required to take English courses from 2200 to 2400 hours for four years. Similar to non-English major students, Cheng (2008) states that English major

students need to pass a national test termed Test for English Major-4 (TEM-4) to get their degree. (as cited in Jeffrey & Adamson, 2011). Students are expected to pass the Test for English Major-8 (TEM-8) to improve their English language proficiency and enhance the competitiveness in job hunting.

1.1.4 The Context of the Present Study

Zunyi Medical University (ZMU), whose predecessor is Dalian Medical College (DMC), with the approval of Chinese Ministry of Education (MOE), was founded in 1947. In 1969, the State Council decided to move DMC to Zunyi to support the development of the Southwest of China and renamed it as Zunyi Medical University.

ZMU is a key medical science university at the provincial level and located in Zunyi, which lies in the north of Guizhou, the southwest of China. ZMU has 68 years of history, and it has developed into a highly accredited multi-disciplinary and multi-specialty medical education institution. For the historical and geographical reasons, the economy and education in Guizhou province are backward, and therefore, the teaching and learning of English there would be more challenging and demanding compared with that in other developed cities in China.

As statistics released by the School of Foreign Languages of ZMU in 2015 shows, ZMU is a relatively medium-sized university with a student population totally about 18,000. It has 16,500 bachelor medical science students (BMSS) and 1,500 master medical science students (MMSS). ZMU offers 14 programs for BMSS, and

37 programs for MMSS. According to Wu et al., (2014), there are three levels of medical degrees: Bachelor of Medicine (BM), Master of Medicine (MM) and Doctor of Medicine (DM). ZMU provides English as a Foreign Language program for both English major students who are studying at the School of Foreign Languages and non-English major students who are studying at the medical science schools. There are 56 faculty members, 47 of which are master degree holders, 2 are Ph.D. degree holders, and 20 have the experience of studying abroad. All the teachers focus on undergraduate courses for English major, non-English major and postgraduate courses.

For the non-English major bachelor students, they are required to take English courses in the first and second years in ZMU. The total learning hours are 216 hours (each year has 18 weeks, and each week offers 6 hours of English lessons). The objective of the course is to enhance students' comprehensive English ability, which could be helpful for their future examinations and job hunting. There are around 60 students in one class, so teaching and learning are not effective. The four-volume textbook named *New Horizon College English* for this course is designed by an outstanding Professor Zhengshu Tang (2003) in China which is published by Foreign Language Teaching and Learning Press. This textbook focuses on integrated skills of speaking, listening, reading, writing, and translation. Unfortunately, in the College English course, there is no specific textbook for writing. Writing exercises are the last part of each lesson, and the content is about the practical writing such as letters, notes,

and announcements. The students just follow the samples and models that the book offers. Besides, most English teachers are highly concerned about grammar correction and test-taking skills rather than helping students to develop language skills (You, 2004). Because of the big class size, there is insufficient time for writing practice and the teachers pay little attention to writing, which leads to students' low English writing proficiency.

For MMSS, they are required to take English course only in the first term of the first year with two weeks (each week with 1.5 hours). Therefore, the total English teaching and learning time is 3 hours. To publish RAs in English is a requirement for graduation of master degree and Ph.D degree in China. Li and Flowerdew (2009) state that international publication has become a requirement for the hiring, promotion, and tenure of academic staff and also for Ph.D. degree candidates in China, but unfortunately there is no specific writing class for MMSS. The writing of MSRAs is very complex and the students have little experience in writing RAs. Moreover, if they want to get their work published internationally, the researchers are required to write it in English. Thus, the absence of teaching how to write MSRAs in English could be a big drawback for these courses offered to the students at ZMU. Due to their inexperience in writing MSRAs in English, low English writing proficiency, and no specific text-book to guide them, the students are not confident to write the English MSRAs. All of these factors contribute to the great challenge for researchers to write MSRAs. However, there is very few studies focus on the move-step structure analysis

of MSRAs. In addition, there is no research conduct the contrastive analysis of move-step structures of the complete AIMRD sections of MSRAs publish in the HIF journals and the LIF journals. In order to fill in the gaps, the present study will investigate the contrastive analysis of move-step structure of MSRAs written by Chinese researchers from the HIF and the LIF journals.

1.2 Statement of Problems

As Suntara (2013) states, RAs is the dominant form of professional paper whose communicative purpose is mainly to share new findings with other members of the authors' discourse community. Writing RAs that are acceptable for publication in a scholarly journal is a challenge to novice writers, especially for non-native speakers. They have to follow a particular pattern of organization accepted by members of that professional community. As Garfield (2000) suggests, researchers are evaluated by the number and quality of their publications, so they are under pressure to publish. The medical science researchers in China have to publish their RAs in English if they want to publish the results of their work internationally. After their works are published internationally, Chinese medical science can spread all over the world. Furthermore, Kanoksilapatham's research (2005) indicates that RAs in English were used to advance scientific knowledge. In fact, over eighty percent of journal articles published internationally were written in English (Hamel, 2007). In that case, the ability to publish RAs internationally is crucial for academic and professional success in

science and technology. However, writing RAs in English is one of the most daunting tasks for researchers. If the researchers cannot follow the conventional styles of RAs, their work might be rejected to be published internationally.

Unfortunately, the students in ZMU have little knowledge about how to write MSRAs in English. The novice researchers in ZMU have problems with getting their work published internationally possibly because of their low English proficiency level. Chinese researchers as foreign language learners feel great challenges to publish RAs in English. In 1998, Chen-lu Tsou, the President of the Chinese Biochemical Society commented on the fact that a large number of Chinese scientists have not published internationally yet. He concluded that the poor English could be the biggest difficulty that prevents Chinese scientists from attempting to publish their RAs at the international level. Apart from that, Flowerdew (1999) interviewed Chinese scholars in Hong Kong and found out that the Introduction section and the Discussion section of RAs are particularly difficult for them to write. Adams-Smith (1983) argues that the phenomenon of bad writing amongst medical practitioners is a long-standing one (as cited in Nwogu, 1997). Hemminki (1982) finds that most clinical trial reports by medical professionals tend to be poorly organized or structured. (as cited in Nwogu, 1997). Nwogu (1997) states that most RAs writers are familiar with the format of RAs, but they lack the awareness that there exists an internal ordering of the information presented in each section of the RAs, which accounts for the difficulty to most writers. Most researchers in ZMU are struggling with composing their MSRAs. One possible

reason might be that little knowledge of this genre, particularly the move-step structure in each section, which has seldom been shown to the students, so they are unfamiliar with the structure of this genre. Thus, there is a need to investigate the moves, steps and their structures of MSRAs written by Chinese researchers at ZMU. Meanwhile, to the best of my knowledge, very little research has been conducted on the moves, steps and their structures of complete AIMRD sections of MSRAs. With this insight, the present study aims to analyze the moves, steps, and structures of each of the AIMRD sections of MSRAs written by ZMU researchers. The findings from this investigation might provide medical science researchers in ZMU with a model to help them write MSRAs in English effectively. ZMU is one of the best medical universities in China, which publishes many MSRAs each year. As stated previously, the English level of medical students at ZMU is low, therefore there is a need to help them to be familiar with the moves, steps and their structures of MSRAs.

1.3 Rationale of the Study

As far back as 2005, Kanoksilapatham points out that RAs in English play the indispensable roles in advancing scientific knowledge among scholars worldwide. Shi (2010) states that due to the globalization and increasing international research cooperation, the ability to read and/or write RAs in English is vital for academic and professional success in science and technology. Moreover, the ability to write academic papers effectively is based on both linguistic ability and an awareness of the

rhetorical structure used in academic writing as accepted by the discourse community (Berkenkotter, Huckin, and Ackeman, 1991, quoted in Zhu, 2004).

Flowerdew (1999) defines RAs as one genre of academic writing, representing the preferred medium of exchanging and advancing knowledge among members of the academic community. At more advanced levels of education, writing RAs are crucial for members of the academic community. As a result, publishing RAs in international journals becomes a threshold for the hiring, promotion, and tenure of academic staff and for Ph.D. degrees candidates in China (Li & Flowerdew, 2009). Meanwhile, publishing their research findings also mean that they have a voice in the international academic community（Shi, 2010). With this in mind, corpus-based genre analysis would be an appropriate method of establishing a clear picture of the RAs genre, because analyzing the move-step structure of RAs will help researchers have a clear schema about RAs, thus they can understand this genre. Isik Tas (2010) states that genre analysis is one of the current trends that have received considerable attention in academic writing.

Much research has been done on the organizational patterns of the different sections of RAs using the move-based approach. Among these studies, some focus on the Abstract (e.g. Weissberg and Buker, 1990; Anderson and Maclean, 1997; Lorés, 2004; Swales and Feak, 2004; Tseng, 2011; Zheng and Zheng, 2012; Juan and Tao, 2013), the Introduction section (e.g. Swales, 1990; Taylor and Tingguang, 1991; Jogthong, 2001; Samraj, 2002; Kanoksilapatham, 2012), the Methods section (Bruce,

1983; Lim, 2006; Peacock, 2011), the Results section (e.g. Thompson, 1993; Brett, 1994; Williams, 1999), the Discussion section (e.g. Holmes, 1997; Fallahi and Erzi, 2003; Yang and Allison, 2003), whereas other studies analyze all the four sections (the Introduction, the Methods, the Results, and the Discussion) or the "IMRD" pattern (e.g. Bruce, 1983; Nwogu, 1997; Kanoksilapatham, 2005; ElMalik and Nesi, 2008; Li and Ge, 2009; Huang and He, 2010; Shi, 2010; 2014; Huang, 2013; Qian, 2014; Amnuai and Wannaruk, 2016). With this insight, the present study aims to analyze the move-step structure of each of the AIMRD section of MSRAs in order to help novice researchers, non-English speaker researchers, or student writers to write MSRAs effectively.

To date, very few researchers have conducted the analysis of MSRAs. Anderson and Maclean (1997) analyzed 80 medical abstracts. Nwogu (1997) analyzed the structure and function of medical RAs written by native speakers. In his study, Nwogu analyzed 30 texts, and found that there are 11 moves in this corpus, consisting of three from each of the Introduction and the Methods sections, two from the Results section, and four from the Discussion section. Williams (1999) analyzed the rhetorical structure in the Results section of MSRAs. Juan and Tao (2013) conducted a study which focused on a comparison of the macro-genre structure and the micro-linguistic features between the English abstracts in the Lancet and the ones in the Chinese Medical Journal. Huang (2013) focused on move structural analysis, and used Skelton's (1994) and Nwogu's (1997) studies as model to identify and analyze

potential moves of total 5 medical RAs. Meanwhile, Jalali and Moini (2014) conducted an analysis of the structure of lexical bundles in Introduction section of MSRAs. So far, very few studies analyzed the complete IMRD sections of MSRAs, and there is no research that conducts the analysis of the complete AIMRD section of MSRAs written by Chinese researchers. Therefore, there is a need to fill in this research gap. The present study will also compare two sets of corpus, 15 MSRAs with the top highest impact factor journals, and 15 with the bottom lowest impact factor journals, both of which were written by Chinese researchers at ZMU in order to identify the variations of MSRAs between the HIF journals and the LIF journals, so that the course designers can follow this model to help researchers in medical science write MSRAs more effectively. Since RAs published in prestigious international journals are considered as good quality RAs (Amnuai, 2012), through analyzing the move-step structure in those MSRAs would help researchers meet the requirements of the international medical science research community. In addition, the contrastive analysis will help researchers at ZMU understand the variations of move-step structure of MSRAs from the HIF journals and LIF journals, thus, this could help Chinese medical science researchers publish their RAs in international journals. Yet, the variations on the move-step structures in English RAs published in the HIF journals and those published in the LIF journals remain unknown. Therefore, there is a need to fill the gap as well.

The impact factor of a journal is the average number of citations received per paper published in that journal during the previous two years. The impact factor is calculated by dividing the number of citations in the Journal Citation Report (JCR) year by the total number of articles published in the two previous years. For example, if a journal has an impact factor of 5 in 2016, it means that its papers published in 2014 and 2015 received 5 citations each on average in 2016. The 2016 impact factor of a journal would be calculated as follows:

2016 impact factor = A/B

A = the number of times that all items published in that journal in 2014 and 2015 were cited by indexed publications during 2016.

B = the total number of "citable items" published by that journal in 2014 and 2015.

The impact factor is a measurement to show the relative importance of a journal within certain fields. The journals with higher impact factors are believed to have higher quality and well-structured than those with lower ones.

1.4 Purposes of the Study

As mentioned above, RAs plays an important role in academic and professional success in science and technology. However, students in ZMU are not informed of the structure of RAs, thus they are unfamiliar with this genre. The major purpose of this study is to identify the moves, steps and their structures of AIMRD sections in MSRAs with the HIF journals and the LIF journals written by Chinese researchers at

ZMU. Besides, this study will compare the differences in terms of moves, steps, and their structures of those elements of MSRAs between the HIF journals and the LIF journals as well. The findings might help novice researchers or student writers at ZMU to write MSRAs effectively. Moreover, it is important to note that all of the journals selected are written by Chinese researchers and at least one of the authors is from ZMU.

1.5 Research Questions

In order to accomplish the objectives stated previously, the present study addresses the following research questions:

1) What are the move, steps, and their structures of the Abstract, Introduction, Methods, Results, and Discussion in MSRAs written by Chinese researchers at ZMU published in the HIF journals and the LIF journals?

2) What are the variations in terms of moves, steps, and their structures of the Abstract, Introduction, Methods, Results, and Discussion of MSRAs between the HIF journals and the LIF journals?

1.6 The Significance of the Study

This study is significant because by analyzing the MSRAs produced by Chinese researchers at ZMU using a selected framework, perhaps a certain rhetorical structure of MSRAs can be identified, and it may offer a valuable resource in the form of a

rhetorical model for assisting writing instructors to help their students produce effective MSRAs. The results from the study could increase students' awareness of rhetorical elements of MSRAs. It might remind textbooks designers and writing instructors of the existing gap between what they provide for learners and what students need to know about MSRAs. Thus, it can provide an idea for them on the development of curriculum materials and activities for writing classes. Besides, the frameworks to be identified will provide valuable models for those who attempt to write MSRAs for publication internationally in the field of medical science to follow. Most Chinese researchers and novice researchers learn how to write a research paper by reading and imitating other researchers' papers. In that case, it would be of great help to use the results of the present study to teach them how to write MSRAs in English, in terms of moves, steps, and their structures. Furthermore, identifying the variations of RAs between those in the HIF journals and the LIF journals might help Chinese researchers increase the awareness of the different move-step structures between the two sets of corpus. This could help Chinese researchers better understand how to make a piece of writing more effective and appropriate. Investigating the variations of the moves, steps, and structures of MSRAs between the HIF journals and the LIF journals might help researchers better understand the moves, steps, and their structures of the two corpora and publish their MSRAs internationally.

Finally, the move-step structure analysis framework might shed some light on the MSRAs writing for medical science researchers at ZMU and researchers in other

universities around China, or even researchers in universities in other countries with similar EFL contexts. Accordingly, much emphasis will be put on this particular genre, thus, a genre-based approach to teaching writing may be greatly promoted in the Chinese context.

1.7 The Scope of the Study

1) This study will be carried out to identify moves, steps and their structures in English MSRAs published internationally written by the Chinese researchers, and at least one author is from ZMU.

2) Only RAs with the AIMRD format will be selected from international journals for the investigation.

3) In this study, only 15 RAs with the top highest impact factor journals and 15 RAs with bottom lowest impact factor journals will be selected.

1.8 Definitions of Key Terms in the Present Study

Rhetorical structures

Rhetorical structures are regarded as rhetorical organizations which consist of moves and steps in terms of writing academic research articles (Kanoksilapatham, 2005).

Move

According to Dudley-Evans and St. John (1998, p. 89), "move means a unit that relates both the writer's purpose and the content that s/he wishes to communicate".

Step

According to Dudley-Evans and St. John (1998, p. 89), "step means a lower level unit than a move that provides a detailed perspective on the options open to the writer in setting out the moves".

Research articles

Research articles are the published articles that aim to report a study conducted by the writer(s) and to disseminate the knowledge gained from the study.

Impact factor

The journal impact factor is the average number of times articles from the journal published in the past two years have been cited in the Journal Citation Report (JCR) year.

Medical science

The medical science means the science of dealing with the maintenance of health and the prevention and treatment of disease, such as bone, vascular pharmacology, neurobiology and neurochemistry.

1.9 Summary

This chapter gives an overview of the present study, including the rationale of the study, the statement of the problem, the purposes of the study, the research questions of the study, the significance of the study, the scope of the study, and the definitions of key terms in the present study. Some issues regarding MSRAs genres and move-step structure are mentioned. In order to have a clear picture of these themes, detailed descriptions are provided in Chapter 2.

CHAPTER 2

REVIEW OF LITERATURE

This chapter provides a review of literature in relation to the present study, which consists of four parts. Part one presents a brief discussion on genre and genre studies regarding definitions of genre and genre studies in three traditions. Part two describes RAs from the perspectives of definitions and characteristics. Part three places emphasis on previous studies on the move-step structure of RAs from two perspectives: studies of individual sections of RAs and studies of the whole research articles. The last part focuses on the previous studies on RAs written by Chinese researchers.

2.1 Genre and Genre Studies

2.1.1 Definitions of Genre

The main focus of the present study is the genres of the AIMRD secions as they appear in MSRAs. The previous studies of RAs have offered valuable frameworks for the research, teaching and learning of writing in various educational contexts. Several definitions of genre have been proposed by different researchers from various perspectives and various disciplines. Swales (1990) provides a comprehensive definition of genre in his book:

> *"A genre comprises a class of communicative events, the members of which share some set of communicative purposes. These purposes are recognized by the expert members of the parent discourse, and thereby constitute the rationale for the genre. This rationale shapes the schematic structure of the discourse and influences and constraints choice of content and style."* (p. 58)

This definition of genre is regarded as the most comprehensive and influential one because it provides an overall picture of what a genre is. It plays a crucial role in the English for Specific Purposes (ESP) approach of genre study. The key point of this definition is the concept of genre as a class of communicative events, and the discourse community shares some sets of communicative purposes. The communicative purposes of a particular genre are recognized by professional members of the parent discourse community.

Apart from that, Bhatia (1993) proposes that genre is an instance of a successful achievement of specific communicative purposes using conventionalized knowledge of linguistic and discourse resources. Similarly, Hyland (2003) defines genre as abstract, socially recognized ways of using language for particular purposes. That is to say, genre is a way to achieve the specific communicative purposes by using language in particular contexts. Hyland (2003) further states that the members of a community can identify the similarities in the texts they use and are able to comprehend or even write the texts by using conventionalized knowledge and communicative practices.

Martin (1984) gives a brief but clear definition of genre that it is a staged, goal-oriented, purposeful activity in which speakers engage as members of our culture. Twenty years later, Martin (2009) gives a further explanation to the original definition, which identifies genre as:

> (i) *staged: because it usually takes us more than one phase of meaning to work through a genre,*
> (ii) *goal-oriented: because unfolding phases are designed to accomplish something and we feel a sense of frustration or incompleteness if we are stopped,*
> (iii) *social: because we undertake genres interactively with others* (p.13).

According to the definitions and characteristics of genre presented above, it can be simply regarded as a social process in which members of a community carry out communicative events to achieve communicative purposes through shared rhetorical structures and linguistic features.

2.1.2 Genre in the Three Traditions

According to Paltridge (2007), the attention to the notion of genre in the field of English language teaching increased in the previous decades. There are three main approaches in analysis of genres: the English for Specific Purposes, the New Rhetoric Approach, and the Australian Approach. Each approach is described in details in the following sections.

2.1.2.1 The ESP Approach

Although English for Specific Purposes (ESP) has emerged since the 1960s and ESP researchers have used genre analysis as a research and pedagogical tool since the 1980s, it is Swales' (1990) ground-breaking book *Genre Analysis: English in Academic and Research Settings* that provides a comprehensive theory and establishes the methodology for the ESP approach to genre analysis and teaching. In particular, Swales' (1990, 2004) CARS (Create a Research Space) models for RA Introduction has become a standard and most frequently used model for move analysis of the Introduction section.

Researchers in ESP hold the belief that genre works as a tool for analyzing and teaching the language for the people whose first language is not English in academic and professional settings (Bhatia, 1993). Among ESP theorists, Swales (1990) and Bhatia (1993) are the most prominent proponents of the ESP approach. The ESP approach aims to aid non-English speakers to increase their realization of global organizational patterns of a range of academic writings through analyzing the structural moves. A genre in the ESP approach deals with a class of communicative events including research articles, dissertations, research reports, seminar presentations, university lectures, and business letters, etc.

Pedagogically, researchers working in the ESP approach usually tend to emphasize at the tertiary level and beyond to help students write the genres required in their academic or professional settings.

2.1.2.2 The New Rhetoric Approach

The New Rhetoric Approach is originated in North America. Experts and practitioners in this approach work with rhetorical tradition, which mainly underlines rhetoric, composition studies, and professional writing in an English L1 context at the tertiary level. Instead of analyzing the substance or form, Miller (1984), one of the most influential members of the New Rhetoric group, argues that genre should place more stress on the actions used to accomplish discourse community's purposes.

Many scholars in the New Rhetoric studies tend to use ethnographic approach rather than linguistic methods in analysis of texts. Hence, in genre studies of this approach, researchers usually apply participant observation, interviews, and descriptions of physical settings as well as analysis of texts as methods in their research (Hyland, 2004). Since the New Rhetoric emphasizes the dynamic quality of genres (Freedman & Medway, 1994) researchers in this tradition strongly disagree with the explicit instruction of genres since genres are evolving through a dynamic process of interaction in a certain context. However, the environment of the classroom is unauthentic, in that case, it cannot compare with the actual rhetorical event that has the quality of the complex nature of negotiations and audiences (Hyland, 2004).

2.1.2.3 The Australian Approach

Australian genre theory as one tradition in genre studies is grounded in Systemic Functional Linguistics (SFL), which is developed by Michael Halliday.

According to Hyon (1996), SFL deals with the relationship between language and its function in social settings. The forms of language are shaped by key features of the context of situation which can be described in terms of register variables: field, tenor and mode (Halliday & Hasan, 1985; Halliday, 1994). These three elements determine the register of language, thus, Halliday's central construct is for registering or for analyzing language instead of genre. The Australian Approach works with primary and secondary school genres and deals with migrant students who are learning English as a second language.

Similar to Halliday, Jim R. Martin, a prominent scholar of the Australian approach, has developed the theories of genre under the SFL, establishing the link among form, function, and context. The Australian School also places focus on teaching the discourse conventions of school and workplace genres to equip students with linguistic knowledge for social success (Hyon, 1996), aiming to help the students from non-English speaking background who lack exposure to a range of texts required in school as well as provide access to linguistic and social resources for the adults with limited educational background.

Essentially, these three traditions of genre have some overlaps as well as distinctions. All the three traditions share the purposes to aid students to become more successful readers and writers of academic and workplace texts (Hyon, 1996). The proponents of both the ESP and the Australian School hold the belief that the structures and features of the text should be taught explicitly by introducing and

analyzing the models of genres, while the New Rhetoric Approach does not offer explicit instructional frameworks for teaching students about the language features and functions of academic and professional genres. In terms of education context, the New Rhetoric Approach emphasizes university composition in L1 context at tertiary level while the ESP approach places stress on non-English speakers at university level for academic and professional writing. However, the Australian Approach places stress solely on primary and secondary school genres and deals with migrant students who are learning English as a second language.

The present study will conduct genre analysis of MSRAs composed by Chinese researchers at ZMU. The ESP approach is concerned about academic and professional writing for non-English speakers at university level, such as research articles, dissertations, research reports and seminar presentations. It aims to help nonnative speakers to familiarize with functions and linguistic conventions. In the present study, MSRAs were written by nonnative speakers in an academic setting, therefore, the purpose of the present study is consistent with the aim of the ESP approach. Thus, this study will use the ESP approach as a guideline to analyze the move-step structures of MSRAs, and it hopes that the findings might be useful for the novice writers, especially in the field of medical science.

2.1.3 Contrastive Rhetoric

The concept of contrastive rhetoric is directly relevant to the investigation of academic writing across language and cultures (Amnuai, 2012). Contrastive rhetoric

(CR) is defined as "an area of research in second language acquisition that identifies problems in composition encountered by second language writers and, by referring to the rhetorical strategies of the first language, attempts to explain them" (Connor, 1996, p. 5). Obviously, the main idea of CR is to to help second language writers understand the interrelationship of L1 and L2 writing patterns and strategies.

Kaplan's (1966) initiated the work of CR in the field of applied linguistics. In this study, he observed that certain ESL students from various linguistic backgrounds employ different recognizable rhetorical movements.

Research into CR is often closely related to genre-specific studies, for example, research articles (Connor, 1996), with the purpose of helping NNES researchers read, write and interact with research that is predominantly written in English (Connor, 1996). There are some researchers investigate the CR about cultural variations such as Li (2010) and Shi (2014). Li (2010) compared move structures of the Introduction section between English and Chinese social science RAs, based on Swales' (1990) CARS model. The results showed that both English and Chinese RAs were similar in terms of the presence of moves. But they varied in choice of steps and the discrepancies can be found in three moves. Shi (2014) investigated moves and lexical bundles of English agricultural science RAs published in China and internationally. The findings indicated that the Chinese and international RAs were similar in terms of their move structures. However, due to the discrepancies between the two corpora, the frequency of moves and steps used and the structures in

each section are different. This study shows the cultural variations in terms of journals.

Apart from the cultural variations, Qian (2014) investigated the disciplinary variations of move-step structure between Management and Marketing RAs. The findings revealed that the RAs in the two subdiciplines have their particular move-step structure. The diversity suggests that disciplinary variations play a key role to determine move structure of RAs.

In the present study, the researcher will conduct the contrastive analysis of move-step structure of English MSRAs written by Chinese researchers published in the international journals between HIF journals and LIF journals. Investigating the variations of the moves, steps, and structures of MSRAs between HIF journals and LIF journals might help researchers better understand the moves, steps, and their structures of the two corpora and publish their MSRAs internationally.

2.2 Research Articles as a Genre

2.2.1 Definitions and Characteristics of Research Articles

RAs emerged historically more than three hundred years ago (Swales, 1990). At the very beginning, scientists used letters to communicate with each other, and later the information used in the letter developed into RAs. Flowerdew (1999) defines RAs as one genre of academic writing that represents the preferred medium of exchanging and advancing knowledge among members of the academic community. At more advanced

levels of education, reading and writing RAs are indispensable for members of the academic community. In the international world of scholarship and research, English plays a dominant role. For non-native speakers, English is an important vehicle to bring their work to the target discourse communities. Kanoksilapatham (2005) indicates that RAs in English were used to advance scientific knowledge. In fact, almost a decade ago, over eighty percent of RAs published internationally were written in English (Hamel, 2007). For this pressing demand, the ability to publish RAs internationally is crucial for academic and professional success in science and technology.

RAs have a dynamic relationship with all the other public research-process genres, such as abstract, conference presentation, grant proposal, thesis, and dissertation (Swales, 1990). These genres are related to the RAs in different degrees, most of them can be derived from the RAs. The standard format of RAs consists of four components: the Introduction, the Methods, the Results, and the Discussion. RAs are divided into a number of rhetorical sections and the communicative function is different from one section to another. That is to say, each section has its own communicative purposes. The main function of RAs is informative and persuasive. The researchers attempt to inform what the study is about, and try to convince the readers to accept the findings of their study. Several researchers have investigated the RAs genre in different perspectives, including RAs structure, social construction and historical evolution. Martínez (2003) summarized the reasons why RAs has attracted the greatest attention among other genres, as follows. First, they have been widely

published annually and they are used to help researchers and postgraduate students succeed in the construction of texts for publication. Second, with the rapid development of research internationally, more and more researchers are eager to publish their findings and want their work to be widely read and frequently cited (Flowerdew, 2013). Finally, RAs can enhance researchers' academic development. Suntara (2013) points out that RAs is the dominant form of professional paper whose communicative purpose is mainly to share new findings with other members of the authors' discourse community. Then, other researchers can evaluate and criticize their work, and in this way, their research skills are improved.

The present study focuses on move-step structure of MSRAs written by Chinese researchers that are published in international journals. Identifying their move-step structure is useful for researchers to gain a better understanding of the RAs genre, as well as for less experienced writers who need assistance when writing for publications to better meet the international scientific community's expectations and demands. Therefore, identifying the move-step structure of RAs is not only for the purpose of having a clear picture of the genre of RAs, but also for improving academic writing. Apart from that, different journals might have different requirements for the move-step structure of RAs. The RAs in higher impact factors journals might have more complex structures, whereas the ones in lower impact factors journals could be not well structured like the higher ones. The next section will have a detail discussion about the relationship between RAs and their impact factors.

2.2.2 Research Article and Impact Factor

The impact factor is a measurement to show the relative importance of a journal within certain fields. The journals with higher impact factors are believed to be more important than those with lower ones.

However, there is a debate on the validity of the impact factor as a measure of the importance of a journal or article. The impact factor and citation analysis in general are affected by the editorial policies, academic factor and celebrity effect. As for the editorial policy, some journal editors set their submission policy that only invites the senior scientists to publish citable papers to increase the journal impact factor. The next one is academic factor. Due to the economic and history factors, different disciplines have different development pace. For example, some popular disciplines' articles will be cited more frequently than those in the unpopular disciplines'. Therefore, the popular ones will have higher impact factor than the unpopular ones. However, it does not mean the scientific value of the popular disciplines' articles is better than the unpopular ones. The last one is the celebrity effect. In order to make their articles more powerful, even researchers have more suitable references to cite, they still use the celebrity's articles as reference. Thus, it is important to note that the impact factor is a journal metric and should not be used to assess individual researchers or institutions.

Different RAs have different impact factors and different journals have different rhetorical requirements that affect the move-step structure of RAs.

However, there is no previous study that compares the differences of move-step structures between RAs published in high impact factor journals and low impact factor journals. Therefore, it is the hypothesis of this present study that the RAs with different impact factors might have variations in terms of move-step structure. Therefore, it is the intention of the present research.

2.3 Previous Studies of Move Analysis of Research Articles

Recently, a number of studies have been done in the area of writing in academic and research settings for specific purposes. RAs, the key channel for the exchange of information has received a great deal of attention in genre analysis. A lot of researchers have made an effort to report the discourse structure of RAs from individual sections to a complete IMRD structure. Hence, this section will summarize some prominent studies on move-based analyses of RAs.

Swales (1990) states that moves and steps are usually a useful tool for researchers to accomplish *communicative purposes* of individual sections (IMRD) of RAs. According to Nwogu (1997), "Move means 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" (p. 122), while "step means a lower level unit than a move that provides a detailed perspective on the options open to the writer in setting out the moves" (Dudley-Evans and St. John, 1998, p.89).

The present study focuses on move-step structures of RAs AIMRD sections. With the purpose to deal with the problem for non-native speakers in the field of medical science, the following sections provide a review of the previous studies on move-step structure of the five rhetorical components above.

2.3.1 Move Analysis of Research Article Abstract

Bhatia (1993) suggested that an abstract is a description or summary of the much longer report that offers readers a condensed version of the full article. Besides, Huckin (2006) defined abstract as the miniature of the whole RAs. It is constantly written at the beginning in RAs or academic papers. Therefore, abstract is the first part that a reader will read to determine whether the research is worth further reading or not. Hence, move structures of abstract were studied and analyzed in different fields of study in order to facilitate novice writers as a guideline to write it in their own paper. According to Weissberg and Buker (1990) and Hyland (2000), abstract contains four or five moves (*PMRC* or *IPMRC*): *Introduction, Purpose, Methods, Results,* and *Conclusion.* Introduction sometimes was optional. Swales and Feak (2004) also stated that there were five moves which a writer should apply in an abstract article: *Background, Aim, Methods, Results,* and *Conclusion (BAMRC).* All of the scholars above suggested that there were at least four or five moves which were required to write in RAs abstract.

Applying Weissberg and Buker's (1990) model as the framework, Anderson and Maclean (1997) studied eighty medical abstracts, which were drawn from four

fields of medicine (clinical medicine, surgery, epidemiology and basic sciences). In order to avoid the differences between British and North American journals, in each field, the researchers selected 10 from a British journal and 10 from a North American journal. The results indicated that the majority of the abstracts were found to be in consistence with the Weissberg and Buker's (1990) results that *Background (B)*, *Purpose (P)*, *Method (M)*, and *Conclusion (C)* frequently occurred, but a considerable number differed. The most salient difference was the method embedding, including the Methods embedded in the Purpose section and the Results section.

Following Weissberg and Buker's (1997) study, Anderson and Maclean (1997) studied eighty medical RAs abstracts which revealed the frequent moves of *Background (B), Purpose ((P), Methods (M), Results (R), and Conclusion (C).* Several reasons for their framework to be adopted in the present study are explained as follows. First, the field of their study is medicine which is relevant to that of the current study, and this relevance helps avoid the disciplinary variations. Second, this framework provides a very detailed move structure. This model helps researchers have a deep understanding about the distinction of move boundaries between the *Purpose* and the *Methods*, the *Results* and the *Conclusion.* Third, the corpus in their study is randomly selected from four fields of international medicine journals. Thus, their corpus is representative. Due to the above reasons, Anderson and Maclean's (1997) model is regarded as an appropriate framework for abstract analysis in the present study.

Lorés (2004) analyzed 36 RAs abstracts in linguistics journals and focused on two parts: rhetorical organization and thematic structure. The results showed that most of the RA abstracts applied the *IMRD* structure *(Introduction, Methods, Results,* and *Discussion)* (61.1%), while the CARS structure was used for 30.5%, and the combinatory was used for 8.4%.

However, different disciplines may adopt different move structures in their abstracts. For example, Tseng (2011) conducted an analysis of move structures and verb-tenses on 90 RAs abstracts in TESOL, Applied Linguistics, and Language Learning. The results showed that most of researchers tended to use a four-move model in their abstracts: *Background, Aim, Methods,* and *Results (BAMR)* instead of the five-move structure: *Background, Aim, Methods, Results,* and *Conclusion (BAMRC)*. Juan and Tao (2013) conducted a study which focused on a comparison of the macro-genre structure and the micro-linguistic features between the English abstracts in *the Lancet* and the ones in *the Chinese Medical Journal. The Lancet* is a world's leading independent general medical journal with an impact factor of 45.2 (2015). *The Chinese Medical Journal (CMJ)* is a local Chinese journal with impact factor of 1.053 (2015). The *CMJ* is published monthly in English by the Chinese Medical Association, and is a peer reviewed general medical journal for all doctors, researchers, and health workers. The results showed that Move 1 (*Research background*) is nearly absent (98%) in the abstracts written by Chinese writers, with only "*Objective*" (Move 2) being the first part; while in the abstracts written by

English native speakers, each abstract begins with *the Statement of the research background* (Move 1), with *the Aim of the research* (Move 2) being presented afterwards.

2.3.2 Move Analysis of Research Article Introduction

The Introduction section is located at the beginning of the RAs after the Abstract. The Introduction section is the first section writers have to start with. Both native and non-native writers have difficulty in writing this section. The communicative purposes of introduction are quite clear: to create a research space, to make claims for the centrality or significance of the research, and to show how the research gap will be filled. During the past two decades, some genre analysts were aware that writing RAs Introduction section is a problem for academic writers, so they have tried to find an approach to figure out the move-step structure of this genre. Swales (1990) states that writing a RAs Introduction section is troublesome to almost all academic writers since they have more difficulty with getting started on academic writing than they have with its continuation. Given importance of the Introduction section to the whole RAs and the difficulties writers may have, it has obtained the most attention compared to other sections in RAs. Many scholars and genre practitioners have shown their increasing interest in the study of this section. The most pioneering and influential work in the field of genre analysis is Swales (1981). The original purpose of his model was used to analyze the Introduction of RAs with the attempt to facilitate reading and writing RAs for non-native speakers

and help them to publish their articles in English. In Swales' (1981) study, he selected 16 RAs from each of the disciplines of physics, medicine, and social sciences. After analyzing the RAs, Swales proposed four distinct moves from the three different fields: Move 1: *Establishing a territory;* Move 2: *Summarizing previous research;* Move 3: *Establishing a niche;* and Move 4: *Occupying the niche.*

Even though Swales' (1981) model attracted great attention, the Introduction sections in the original corpus were short, when other researchers attempted to apply Swales (1981) model into their analysis of longer Introductions, some problems occurred. For example, Crookes (1986) examined the structure of twenty-four Introductions from hard and soft sciences by using this model, and found that soft sciences tended to have longer Introductions which lead to the recycling of Move 2: *Literature review* and Move 3: *Preparing for present research niche*. Apart from that, Crookes (1986) found that it is difficult to separate Move 1: *Establishing the field* and Move 2: *Literature review.*

In order to correct the problems of his 1981 model, Swales (1990) modified the model by merging the first two moves and he called it the Create a Research Space (CARS) model. This revised model consists of three moves. Table 2.1 below shows the sequences of moves and steps in the CARS model, which are largely predicable in RA Introduction section.

Table 2.1 The CARS Model by Swales (1990, p.141)

Move 1	Establishing territory Step 1 Claiming centrality and / or Step 2 Making topic generalization(s) and / or Step 3 Reviewing items of previous research
Move 2	Establishing a niche Step 1 A Counter-claiming or Step 1 B Indicating a gap or Step 1 C Question-raising or Step 1 D Continuing a tradition
Move 3	Occupying the niche Step 1 A Outlining purposes or Step 1 B Announcing present research Step 2 Announcing principal findings Step 3 Indicating RA structure

There are three moves in Swales (1990) model: Move 1: *Establishing a territory*; Move 2: *Establishing a niche*; and Move 3: *Occupying the niche*. These three obligatory moves play significant roles in RAs. The functions of Move 1 are to state the importance of the study, make general statements about the study, and review the previous studies. Move 2 is accomplished by pointing out the weaknesses or limitations of previous studies or raising questions about the existing research. The main function of Move 3 is to fill the gap(s).

Swales' (1990) move model was empirically investigated and it has validated the schematic structure of various RAs in different disciplines. Comments made by some experts (e.g. Bhatia, 1993; Samraj, 2002) have reflected the defect of Swales' model. For example, there was a problem in distinguishing one move from another move because the review of literature can be found in all three moves, rather than

Move 1 only, and there are no steps in the CARS model for dealing with the definition of terms or examples to illustrate difficult concepts. Accordingly, disciplinary variations need to be considered when applying this Swales' model.

Due to the criticism of its limitations, the CARS model was revised. This new CARS model (2004) is adequately applicable for the variations of the Introduction section in diverse research fields. Swales' model (2004) still consists of three moves: Move 1: *Establishing a territory*, Move 2: *Establishing a niche*, and Move 3: *Presenting the present work*. The most significant changes in the revised model are in Move 1 and Move 3. The number of steps in Move 1 has been reduced to only one: '*Topic generalizations of increasing specificity*'. *Review of literature* is not restricted to Move 1 Step 3, but it occurs throughout the Introduction section. In Move 2, only 2 steps remain with a new optional step called '*Presenting positive justification*'**.** The last move is renamed as '*Presenting the present work*' with seven steps.

Apart from the influential study done by Swales (1990), the Introduction section has been frequently analyzed from various disciplines. Another area of study, which is growing in importance, is to test the CARS model for cultural and disciplinary variations. Jogthong (2001) analyzed RAs Introduction section written in Thai by Thai academic writers. Forty RAs Introductions are selected from Thai journals in education and medical fields to build the corpus for her study. Swales' (1990) CARS model was used as a framework to analyze the rhetorical organization as well as the linguistic features of RAs Introduction section. Three moves and ten

steps were identified. The results of the study show that the move pattern of the RAs Introduction section follows Swales' (1990) framework, but the specific steps in the Introduction section were less consistent with the model. The findings also indicated that the Thai writers avoided criticizing and evaluating the works of others and they did not reveal the findings of their research and the RAs structure in the Introduction section. The Thai writers ended their RAs Introduction section by indicating implications of their research and left them for their readers to evaluate. Jogthong (2001) explained these differences in terms of Thai culture in which such a claim is considered too assertive and culturally unacceptable.

Similar to Jogthong's study, Samraj (2002) analyzed the rhetorical structure of RAs Introduction section from two related disciplines: Wildlife Behavior and Conservation Biology, by using Swales' (1990) CARS model. Twelve RAs, all published in 1995, were randomly selected from two journals in two disciplines: Conservative Biology and Animal Behavior. The results of this study revealed that there were disciplinary variations in the structures of the genre between these two related disciplines. Samraj (2002) suggested that the reason for these differences might be because Conservation Biology is a newly emerging field which lacks a substantial body of established research to draw on as in other fields with a longer history. In addition, based on her research findings, Samraj (2002) found that *the review of literature* can be found not only in Move 1 but also in all the three Moves but it serves different rhetorical functions in each move: presenting background

information in Move 1, Step 2, elaborating on the gap in research in Move 2, Step 1, and displaying of the goal of the study in Move 3, Step 1. These results suggested that a deeper exploration of Swales' (1990) model is needed to explain the structures found in the Introduction section.

Except from the interdisciplinary variations mentioned above, intradisciplinary variations were also found by using the CARS model. A recent study on RAs Introduction section is carried out by Kanoksilapatham (2012) in which a contrastive study on the rhetorical structure of RAs Introduction section in three engineering subdisciplines (civil engineering, software engineering, and biomedical engineering). This study attempted to identify the generic structures and variations of the Introduction section in three subdisciplines. Her corpus consisted of 180 Introduction which were selected from five top journals from each subdicipline. Besides, 12 experimental RAs with the IMRD conventional pattern were selected from each journal to make up 60 RAs in each subdiscipline.

The results showed that all three moves occurred frequently in three subdisciplines, the sequence of Moves 1-3 was predominant across these three subdisciplines, and Moves 1 and 2 were found to be cyclical, especially in longer Introduction. A number of major differences at the step level were identified across the three subdisciplines. The use of some steps in Moves 1-3 differed in one subdiscipline from the others. Due to the disciplinary variations, some steps occurred more frequently in a certain subdiscipline than in the others. Kanosilapatham (2012)

proposed that the awareness of certain conventions in the academic genre helps the novice scholars to publish successfully in their field.

In summary, RAs Introduction section has attracted much attention of scholars and genre practitioners. Swales' CARS models (1981, 1990, and 2004) have been widely applied to the Introduction section analysis in both academic and in professional genres. Furthermore, the CARS model has been used as an analytical framework of RAs Introduction section in a variety of disciplines. Apart from that, the CARS model firstly generated for the Introduction section has been extended to other sections of RAs. This will be discussed later in the following sections.

2.3.3 Move Analysis of Research Article Methods

The location of the Methods section is traditionally between the Introduction and the Results sections in RAs. Investigations into the Methods section are important in that the communicative purposes of the Methods section are to present how data were collected, how the procedures were carried out for the experiment, and how data analysis was conducted with the function of showing the reader the research activities of the study being reported. Apart from that, Lim (2006) claims that writers may also use the Methods section to convince the readers of the reliability and validity of results reported in the Results section. However, very few previous researchers, e.g. Wood; 1982; Lim, 2006; Peacock, 2011, have examined the individual section of the Methods, and there appeared to be few studies of move structure in contrast to studies of the Introduction.

Wood (1982) might be the first researcher to identify the move structure of the Methods section. A corpus of 10 RAs from chemistry was analyzed and three moves were found, including Move 1: *Describing the sample*, Move 2: *Describing an apparatus*, and Move 3: *Describing experimental procedures*. As noted by Wood (1982), Moves *Describing an apparatus* and *Describing experimental procedures* were optional in that they were unnecessary to show information about the instruments and the experimental procedure if they were commonly used in their discipline.

Lim (2006) analyzed the communicative functions of the Methods section in Management RAs as reflected in its rhetorical moves and constituent steps. A total of 20 RAs were selected from two high-status management journals: *Journal of Management* and *Academy of Management Journal*. The analysis was conducted in two perspectives. One is rhetorical structure investigation, and the other was linguistic features identification. The relationship between these two aspects was investigated as well. He identified 3 moves and 12 steps in the Methods section. The three Moves include: *Describing the data collection procedures*, *Delineating procedure/s for measuring variables*, and *Elucidating data analysis procedure/s*. The findings also revealed the pedagogical significance of the relation between linguistic features and language content. It recommended that writing courses should be tailored to fit the needs of students who have difficulties in linking linguistic features with communicative functions of their academic writing.

The latest research is conducted by Peacock (2011) which reports a communicative move structure of 288 RAs Methods across eight disciplines: physics, biology, chemistry, environmental science, business, language and linguistics, law, and public and social administration. Peacock (2011) only identifies what elements are included in the Methods section rather than applying any model with detailed description of rhetorical structures, which are proposed by previous researchers. The results revealed that seven different moves in the majority of the RAs are presented in this order: *Overview, Location, Research aims/questions/hypotheses, Subjects/materials, Procedure, Limitations,* and *Data analysis*. These findings added more knowledge of genre conventions to academic writing, therefore improving the understanding of the schematic structure of the Methods section and helping teachers or course designers prepare discipline-specific courses for students.

In summary, these findings also showed that great variation in moves and move structures occurs between individual disciplines, and interdisciplinary differences exist in the overall move frequency across science and non-science disciplines. It seems that there is no uniform structure for the Methods section. Thus, there is a need to carry out a discipline-specific teaching of move structure of the Methods section.

2.3.4 Move Analysis of Research Article Results

The Results section is conventionally the third section of the RAs with the IMRD pattern, the place where new findings are not only highlighted but also

interpreted and commented upon by authors(Brett, 1994). Hyland (1998) claims that the Results section plays the vital role in RAs since it conveys new knowledge through the presentation, explanation and interpretation of data to persuade readers of the validity of the scientific facts which underlie a particular knowledge.

Among the previous research, Brett's (1994) study is likely the most influential model in studying the Results section. By applying Swales' (1990) model, Brett (1994) examined the Results section of 20 sociology RAs, and identified 3 major moves: metatextual, presentation, and comment moves. He described each of the three moves in terms of function, lexis, and grammatical form. Under each major move, 13 sub-moves were discovered as follows. First, the metatextual move consisted of a *Pointer* and *the Structure of section*. Second, the presentation move included *Procedure, Hypothesis restated* and *Statement of data*. Third, the comment moves covered *Comparison of finding with the literature, Evaluation, Further research suggested, Implications* and *Summarizing*. In addition, the results indicated that the occurrence of the three organizational categories is cyclical, and the most frequent pattern is *Pointer* (metatextual) followed by *Statement of Finding (Presentation)*, and *Substantiation of the Finding (Presentation)*. Brett's model (1994) has been proved to be an adequate basic model of the rhetorical structures of the Results section for interdisciplinary genre analysis (Williams, 1999). Thus, many researchers, such as Williams (1999); Yang and Allison (2003); Atai and Falah (2005) adopted his framework as a reference to identify the move of the Results section in other disciplines.

In order to test how Brett's (1994) model might be used pedagogically with undergraduate students of medicine, Williams (1999) analyzed 8 medical RAs Results section in each of 8 disciplines (4 clinic and 4 experimental) by using a modified version of the rhetorical categories proposed by Brett (1994). Ten moves are identified in Williams' (1999) study, including Move 1: *Pointer*, Move 2: *Structure of section*, Move 3: *Procedural*, Move 4: *Statement of finding/result*, Move 5: *Substantiating finding*, Move 6: *Non-validation of finding*, Move 7: *Explanation of finding*, Move 8: *Comparison of findings with literature*, Move 9: *Evaluation of finding or Hypotheses*, and Move 10: *Implications of finding*.

The analysis revealed that the *Statement of Finding* Move represented 77% of sentences and occurred in both cyclical and linear patterns. The type of report and the subject matter were found to influence the organization and pattern of presentation. Although eight articles belonged to the same discipline of medical science, they were mixed by different genres, such as a clinical report and an experimental study. With some further refinements to the modifications, they confirmed the existence of disciplinary variation. Due to the small size of samples in William's (1999) corpus, the results remain to be substantiated.

Yang and Allison (2003) explored the possible relationships among the Results, the Discussion, the Conclusion, and the Pedagogic Implications sections of 20 RAs from the field of applied linguistics. They proposed a six-move model for the Results sections as follows: Move 1: *Preparatory information*, Move 2: *Reporting*

results, Move 3: *Commenting on results*, Move 4: *Summarizing results*, Move 5: *Evaluating the study*, and Move 6: *Deductions from the research*. In addition to moves and steps, the Results section tended to have a highly cyclical structure, and not only reported results but also briefly commented on results, which is consistent with Brett (1994) and William (1999). Moves 1-3 were dominant and Move 3 was obligatory in their corpus.

In view of the limitations of William's (1999) investigation, Atai and Falah (2005) examined the differences between the generic structure of the Results and the Discussion sections of applied linguistics RAs written by English native speakers (ENS) and Persian native speakers (PNS). Their corpus included 80 articles (40 from international and 40 from Iranian journals). These texts were analyzed using Brett's (1994) model. Six moves were found: Move 1.1: *Pointer*, Move 2.1: *Procedure*, Move 2.2: *Hypothesis restated*, Move 2.3: *Statement of data*, Move 3.1: *Comparison with literature*, and Move 3.2: *Evaluation*. It is worth claiming that both of the Moves 1.1: *Pointer* and 2.3: *Statement of data* was obligatory. Meanwhile, four of the Moves found by Brett (1944) were absent, including Move 1.2: *Structure of section*, Move 3.3: *Further research suggested*, Move 3.4: *Implications* and Move 3.5: *Summarizing*. The study reveals that there is no distinct difference was found in terms of the move structure between ENS and PNS writers.

In summary, both hard science and soft science not only report results but also make comments on results, such as interpreting results and explaining results. It shows that there is a uniform structure in the Results section.

2.3.5 Move Analysis of Research Article Discussion

The Discussion section is conventionally the last section of RAs with the IMRD format. The communicative purpose of the Discussion section is to comment on the results by interpreting, accounting, and comparing with previous work (Amnuai and Wannaruk, 2013). For this reason, the Discussion section is regarded as the most important section and it is the section students have the greatest difficulty with (Dudley-Evans 1994).

Previous research studies have shown that there are some significant variations in the structural organization in corpora of RAs Discussion section. As early as 1988, Hopkins & Dudley-Evans examined the cyclical organization of the Discussion section in master's theses of biology and conference proceeding papers in agricultural science. In their study, 11 Moves were identified, including Move 1: *Background information*, Move 2: *Statement of results*, Move 3: *(Un)expected outcomes*, Move 4: *Reference to previous research*, Move 5: *Explanation of unexpected results*, Move 6: *Exemplification*, Move 7: *Deduction*, Move 8: *Hypothesis*, Move 9: *Reference to previous research*, Move 10: *Recommendation*, and Move 11: *Justification*. Particularly, the results suggested that only Move 2 was an obligatory move.

Later, Dudley-Evans (1994) modified his previous work and proposed a 9-move sequence: Move 1: *Information move* (background about theory/research aims/methodology), Move 2: *Statement of results* (either a numerical value or

reference to a graph or table), Move 3: *Findings* (same as statement of results, but without a reference to a graph or table), Move 4: *(Un)expected outcomes* (a comment on whether the result is expected or not), Move 5: *Reference to previous research*, Move 6: *Explanation* (reasons for unexpected results), Move 7: *Claim* (a generalization arising from the results: contribution to research), Move 8: *Limitations*, and Move 9: *Recommendations* (suggestions for further research). In contrast to the findings of Hopkins and Dudley-Evans' (1988) study, Dudley-Evans (1994) carefully pointed out that the moves identified in the Discussion involved a series of move cycles combining two or more of these nine moves, and he created a three-part framework as follows: I. Introduction with Moves 1, or 1+5, or 2/3; II. Evaluation with the "key move cycles" of 2/3+5, 7+5, or 5+7, and III. Conclusion with Moves 3+7, or 9.

Using Hopkins and Dudley-Evans's (1988) model as the framework, Holmes (1997) analyzed structure of the Discussion section in social science. Thirty articles were selected for analysis, 10 each from the disciplines of history, political science, and sociology RAs. The results revealed that there is no move completely obligatory. The most common moves are Move 6: *Generalization,* and Move 2: *Statement of Results.* Another important finding is that the significant disciplinary variations in the Discussion section. With regard to Move 2: *Statement of Results,* which was favored by sociologists, Move 6: *Generalization,* which was especially prominent in political science texts, Move 7: *Recommendation,* which was much more evidence in

sociology texts than in the other two disciplines and Move 8: *Outlining Parallel or Subsequent Developments,* which occurred only in history articles.

Peacock (2002) explored disciplinary variations in the Discussion section in seven fields, physics, biology, environmental science, business, language and linguistics, public and social administration, and law. Thirty six RAs were chosen from each of the disciplines, which make up the total corpus of 252 RAs. The Discussion sections were analyzed by using Dudley-Evans' (1994) model. This study explored two types of differences. One is interdisciplinary variations, and the other is the differences between native speakers (NS) and non-native speakers (NNS). Two types of differences were found in the number and type of moves and move cycles. In terms of interdisciplinary, move cycles are much more frequent than average in language and linguistics, and in law; and considerably less frequent in physics and in environmental science. Concerning NS/NNS variations, interestingly, Move 7: *Claim*, Move 8: *Limitation* and Move 9: *Recommendations were* revealed to occur much less in the Discussion section written by NNS authors in both of the two sciences (physics and biology) and in all three humanities ((business, language and linguistics, and public and social administration), respectively. There are considerably fewer move cycles in papers by NNS authors in biology, environmental science, and business; and more in physics and in language and linguistics Discussion section.

Following Yang and Allison's (2003) model, Amnuai and Wannaruk (2013) conducted an investigation into move structures of the Discussion section written in

English but published in local Thai and international journals. Their corpus consists of 60 English texts in applied linguistics, including thirty from local Thai journals and thirty from international journals, respectively. Seven moves were identified from the two corpora. The finding showed that there was no compulsory move found in any Discussion, and the most frequent move in both sets of data was Move 4: *Commenting on results*. This may be due to the fact that the main function of the Discussion section of a RA is to comment on the results by interpreting, accounting, and comparing them with previous work. It is noticeable that the salient differences between the two corpora were found in Move 6: *Evaluating the study* and Move 7: *Deductions from the research*. It seems that Thai writers preferred to generalize their study (Move 7) more than their international counterparts. On the other hand, international writers appeared to evaluate their study (Move 6) more frequently than Thai writers.

In conclusion, the move analysis of the Discussion section of RAs has received great attention. Although this section has been examined for disciplinary variations and cultural/language variations, a uniform of move structure still has not been agreed upon yet. Therefore, more research is needed to provide better insights into the rhetorical structure of the Discussion section in a wider variety of disciplines.

Table 2.2 Previous Studies of Move Analysis of Each Section

Focus	Studies
Abstract	Anderson and Maclean (1997); Lorés (2004); Tseng (2011); Juan & Tao (2013)
Introduction	Swales (1990); Jogthong (2001); Samraj (2002); Kanoksilapatham (2012)
Methods	Wood (1982); Lim (2006); Peacock (2011)
Results	Brett's (1994) ; Williams (1999); Yang and Allison (2003); Atai and Falah (2005)
Discussion	Hopkins & Dudley-Evans (1988); Dudley-Evans (1994); Holmes (1997); Peacock (2002); Amnuai and Wannaruk (2013)

2.3.6 Move Analysis of the Whole Research Article

Previous studies seem to lay stress on the structure of individual sections of RAs, while the number of studies focusing on a complete section of (I-M-R-D) is very small. As we all know, it is very useful to understand the complete move structure of RAs as a whole entity. However, to the best of my knowledge, only ten research studies focus on the move structure of all four sections of RAs. These include four studies in medical science (Nwogu, 1997; ElMalik & Nesi, 2008; Li & Ge, 2009; Huang, 2013), one in computer science (Posteguillo, 1999), one in biochemistry (Kanoksilapatham, 2005); one in applied linguistics (Amnuai, 2012), one in management and marketing (Qian, 2014), and two in agricultural sciences (Shi, 2010;

2014). Since Amnuai (2012) and Qian (2014) belong to soft sciences, thus the researcher will not review these two studies.

Nwogu (1997) is a pioneering work on exploring the rhetorical structure of the whole MSRAs of the complete IMRD sections. Following Swales' (1990) model, Nwogu (1997) analyzed fifteen RAs with complete IMRD sections. Based on his findings, an eleven-move structure was identified. The Introduction section contains Move 1: *Presenting background information*; Move 2: *Reviewing related research* and Move 3: *Presenting new research*. The Methods section consists of three moves as well: Move 4: *Describing data-collection procedure*; Move 5: *Describing experimental procedures*; Move 6: *Describing data-analysis procedures*; Move 7: *Indicating consistent observation* and Move 8: *Indicating non-consistent observation* are two constituent moves in the Results section. The Discussion section comprises Move 9: *Highlighting overall research outcome*; Move 10: *Explaining specific research outcome*; and Move 11: *Stating research conclusions*. He claimed that his eleven moves were developed concisely and unambiguously, particularly the Methods and Results sections which he found reliable and consistent in their usage in the medical field. Nwogu (1997) suggested that the findings of the study might help the authors of experimental research to get a better understanding of how the overall research rhetorical patterns were organized.

Applying Swales' (1990) model as a framework for the Introduction section, taking Brett's (1994) model as reference in the Results section and following Swales'

(1990) model as a framework for the Discussion section, Posteguillo (1999) investigated the rhetorical structure of RAs in the field of computer science. Forty RAs from three different academic journals were analyzed and 14 moves were found. However, the results indicated that the structure of computer science articles seems to be different from the IMRD pattern. In his study, he analyzed the Introduction, the Results and the Conclusions sections only, because the Methods section is embedded in the Introduction section. The section following the Introduction section is conventionally termed the "Methods" but computer engineers use the term "Preliminaries," "Algorithms," or "Analysis of a Problem" instead. In addition, although Swales (1990) has claimed that Move 1, Step 3: *Reviewing items of previous research* in his CARS model was an obligatory step, it was found to be an optional step in Posteguillo's (1999) study. There was frequent use of Move 3, Step 2: *Announcing the principal findings*. Also, *Indicating RA Structure* (Move 3, Step 3) was an obligatory move in computer science. He explained that this could be due to the fact that computer science was a relatively new academic discipline at that time so RAs in computer science still lacked a standard structure and that the IMRD pattern could not be completely applied.

Following Swales' (1990) model, Kanoksilapatham (2005) conducted an investigation on the rhetorical structure of complete biochemistry RAs. Sixty biochemistry RAs were selected from top five journals in biochemistry, and twelve articles were randomly selected from each of these journals. Fifteen moves were

identified. The Introduction section contains three moves: Move 1: *Announcing the importance of the field;* Move 2: Preparing for the present study; and Move 3: *Introducing the present study*. The Methods section includes four moves: Move 4: *Describing the materials;* Move 5: *Describing experimental procedures*; Move 6: *Detailing equipment*; and Move 7: *Describing statistical procedure;* The Results section includes four moves: Move 8: *Stating procedure;* Move 9: *Justifying procedures;* Move 10: *Stating results;* and Move 11: *Stating comments on results*. In addition, four moves for the Discussion section: Move 12: *Contextualizing the study*; Move 13: *Consolidating results*; Move 14: *Stating limitations of the study;* and Move 15: *Suggesting further research.* It is worth noting that Move 2: *Preparing for the present study* did not occur in some articles and this might be due to the scientists assume that the reader understand that the work presented is conducted in the same manner as previous studies. Another distinct finding is that Move 9: *Justifying procedures or methodology* was identified while it was not reported in move structures in other disciplines. The findings of this study not only empower native and non-native scientists to better understand published RAs but also facilitate them to become proficient academic readers and writers.

Following Nwogu's (1997) model for reference, ElMalik and Nesi (2008) examined the cultural variations of MSRAs between British and Sudanese. Twenty RAs were examined: 10 by British and 10 by Sudanese writers. The findings showed that Move 1 was obligatory in both the British and Sudanese articles; Move 11: *Stating*

research conclusions occurred in all the British articles, but only in seven Sudanese articles. Furthermore, clear differences were noted in the linguistic features to realize the rhetorical move functions. For example, Sudanese researchers made greater use of the passive than the British writers did. The British researchers preferred to employ nominalization as an alternative means to express authorial disinterestedness. The findings of this study might shed some light on informing the content of academic writing courses in Sudanese medical schools.

Adopting Nwogu's (1997) framework, Li and Ge (2009) compared the English-medium medical RAs in twenty-five RAs published between 1985 and 1989, with twenty-five RAs published between 2000 and 2004. These fifty RAs were chosen from the five English medical journals. The results revealed that Moves 1 and 6 switched from optional to obligatory, while Move 9 switched from obligatory to optional. With regard to verb tense, the frequency of the past simple tense significantly increased in Move 3 as well as the present simple tense in Move 10. However, the frequency of the present perfect tense greatly decreased in both Move 3 and Move 10. The findings of this study may help medical science writers better understand the changes or development of MSRAs over time both structurally and linguistically.

Huang (2013) focused on move structural analysis, and used Skelton's (1994) and Nwogu's (1997) studies as model to identify and analyze potential moves of total 5 medical RAs published between 2005 and 2013 selected from the electronic

archives of the *Lancet*. Twelve moves and 16 steps were identified in these RAs: 4 moves in the Introduction section, 4 moves in the Methods section, 1 move in the Results section and 3 moves in the Discussion section. Out of the 12 moves identified, 11 moves were obligatory and only Move 2: *Present past research and point out missing information* is optional. However, it should be noted that several steps within each move did not always accomplish the rhetorical purpose that each move presented. For example, in Step 8b: *Software used* whose frequency is limited ว 20% occurred in all five of the MSRAs.

Shi (2014) investigated moves and lexical bundles of English agricultural science RAs published in China and internationally. In her study, two corpora of 45 local and 45 international RAs in agricultural science were analyzed applying Kanoksilapatham's (2005) model as a framework. The findings indicated that the Chinese and international RAs were similar in terms of their move structures. Sixteen moves were identified in each corpus: three for the Introduction section, five for the Methods section, four for the Results section and four for the Discussion section. However, due to the discrepancies between the two corpora, the frequency of moves and steps used and the structures in each section are different. Comparing with those from previous studies, the move structure of agricultural science RAs seemed to have its own distinct format. The diversity suggests that disciplinary variations play a key role to determine move structure of RAs.

All studies reviewed in this section regarding move-based analyses were carried out by different researchers in various fields. Table 2.2 below provides a summary of these studies.

Table 2.3 Previous Studies on the Move Structure of Complete IMRD Sections

Author(s)	Year	Discipline(s)	No. of RAs	Findings
Nwogu	1997	Medical Science	15	11 moves
Posteguillo	1999	Computer Science	40	14 moves
Kanoksilapatham	2005	Biochemistry	60	15 moves
Elmalik & Nesi	2008	Medical Science	20	11 moves
Li & Ge	2009	Medical Science	50	11 moves
Shi	2010	Agricultural Science	30	16 moves
Amnuai	2012	Apply Linguistic	60	20 moves
Huang	2013	Medical Science	5	12 moves
Qian	2014	Management and Marketing	64	26 moves
Shi	2014	Agricultural Science	45	16 moves

The above sections provide a clear picture about move analysis of RAs in different disciplines by different researchers. The following section will discuss about the previous studies of RAs written by Chinese researchers that is related to the present context.

2.4 Previous Studies on the Move Analysis of RAs Written by Chinese Researchers

2.4.1 Move Analysis of Medical Science Research Articles Written by Chinese Researchers

By applying Swales' (1990) model as a framework, Huang and He (2010) explored the differences in the Methods section written in English and Chinese in two disciplines: applied linguistics and medical science. Their corpus consisted of 60 experimental RAs with 15 RAs from each aspect: international medical and applied linguistic journals and local medical and applied linguistic journals. The findings indicated that the variations between the field and language community would influence the writing of the Methods of RAs.

Juan and Tao (2013) conducted a study, which focused on a comparison of the macro-genre structure and the micro-linguistic features between the English abstracts in *the Lancet* and the ones in *the Chinese Medical Journal*. One hundred English abstracts were selected, with 50 being randomly sampled from each journal. All of the articles were published between May, 2012 and July, 2012.

At the macro-level, the results showed that each abstract comprised 4 parts both in RAs written by Chinese and English native speakers. Parts 3 and 4 were almost about the same content respectively stating the "*Methods*" (Move 3), "*Results or Findings*" (Move 4). It was shown that Move 1: *Research background* is nearly absent (98%) in the abstracts written by Chinese writers, with only "*Objective*"

(Move 2) being the first part; while in the abstracts written by English native speakers, each abstract begins with *the Statement of the research background* (Move 1), with *the Aim of the research* (Move 2) being presented afterwards. Moreover, at the micro-level, Chinese writers tend to overuse (37%) passive structures and avoid the use of first-person pronouns, which is inconsistent with their counterparts' preference to the active voice and the first-person pronouns.

2.4.2 Move Analysis of Research Articles Written by Chinese Researchers in Other Disciplines

Taylor and Tingguang's (1991) examined the rhetorical organization of English RAs Introductions written in three ways: in Chinese, in English by Chinese writers and in English by English L1 writers. This study was the first published study to explore language variations between Chinese and English with the focus on investigating the social-cultural differences. In this study, 31 RAs were selected from hard science (mineral processing, geophysics, and materials engineering). The results indicated that twenty RAs Introductions written by Chinese writers both in English and Chinese are different from their English counterparts in three perspectives. First, the twenty articles written by Chinese writers were shorter than those of their English counterparts. Second, Chinese writers tended to have fewer citation. Third, with regard to the Chinese writers prefer non-threatening and face saving strategies, they seemed reluctant to expose the names of previous researchers who criticize others' work. In that case, establishing a niche is not straightforward in Chinese like it is in English.

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Zheng and Zheng (2012) investigated the generic structures of 60 abstracts from English teaching and learning journals written by Chinese and English native writers, respectively. The results showed that, first, English natives tended to write longer abstracts than Chinese counterparts; second, the move structure of the abstract written by English natives appeared to be more complete than that written by Chinese writers; third, English natives tended to give more information of the background, whereas Chinese writers focused more on the explanations of the results.

In summary, from the above research, the researcher concludes that in the micro-level, Chinese researchers tend to overuse passive structures and avoid use first-person pronouns. In the macro-level, the disciplinary variation exist that the *Background* is nearly absent in the Abstract written by Chinese researchers.

2.5 Summary

This chapter offers a review of literature mainly from four aspects: genre and genre studies, the characteristics of RAs, the relationship between RAs and impact factor and previous studies of move analysis on RAs. The methodology of identifying move-step structure is presented in Chapter 3.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter describes in detail the methodology used in the present study. It conducts move analysis on the created corpus of MSRAs published in HIF journals and LIF journals before contrastive analysis between these two sets of data to find out the move-step structure variations between HIF journals and LIF journals. This chapter starts with the data collection, and this process includes the corpus size, corpus identification, and corpus management. Then, a detailed description of data analysis that covers the selection of frameworks for move analysis, the method of move identification, and inter-coder reliability will follow. Finally, this chapter ends with the description of a pilot study.

3.1 Research Design

To address the research questions of the present study, move-step structure analysis and contrastive analysis were carried out. Figure 3.1 illustrated the procedures of the research design in the present study. In the first stage, the move-step structure identification was conducted on MSRAs published in HIF journals and LIF journals. In addition, the present study would analyze five sections: Abstract, the Introduction, the Methods, the Results, and the Discussion sections. The selection of

analytical frameworks for each section would be discussed later in this chapter. In the second stage, the findings from the analysis of the move-step structures of the two corpora would be compared by using contrastive analysis to investigate whether variations really exist.

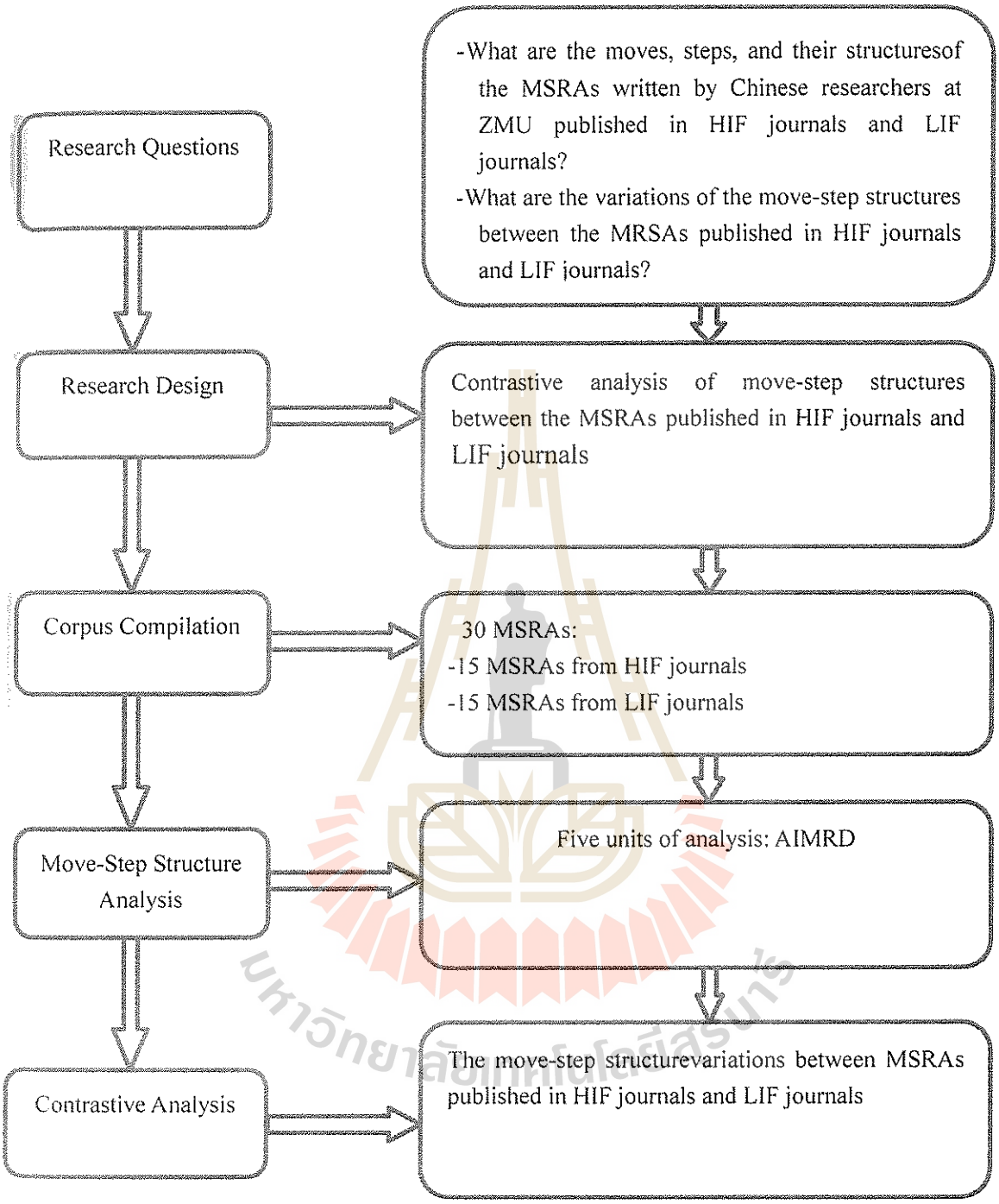

Figure 3.1 Flow Chart of Research Methodology

3.2 Data Collection

3.2.1 Corpus Size

The objectives of this study are to identify the move-step structure of each of the Abstract, Introduction, Methods, Results, and Discussion (AIMRD) section in MSRAs written by Chinese researchers at ZMU. In addition, this study also investigates how the move-step structures identified vary between the HIF journals and the LIF journals. In order to achieve these objectives, the MSRAs written by Chinese researchers at ZMU published in the HIF journals and LIF journals international journals were selected to create two sets of corpus.

In the present study, a total of 30 MSRAs written by Chinese researchers at ZMU were selected to create the target corpus of the present investigation, including 15 RAs published in the top highest impact factor journals and 15 RAs published in the bottom lowest impact factor journals. According to the previous studies in a similar nature, the sample size often ranged from 15 to 60 RAs (e.g. Nwogu, 1997; Posteguillo, 1999; Kanoksilapatham, 2005; Shi, 2010; 2014; Qian, 2014). Nwogu (1997) finally analyzed 15 RAs after the preliminary analysis of 30 articles. In order to explore the move structure of RAs in agricultural science, Shi (2010) analyzed 30 RAs. Despite the large corpus of 60 RAs in Kanoksilapatham (2005), she investigated the rhetorical structures of the IMRD sections without touching the Abstract. In contrast, in the present study, the researcher carried out move-step structure analysis of AIMRD sections in MSRAs written by Chinese researchers at ZMU and also

conducted contrastive analysis to identify variations in move-step structures of MSRAs between HIF journals and LIF journals.

3.2.2 Corpus Identification

3.2.2.1 Selection of Journals

Based on the criteria of reputation, representativeness and accessibility (Nwogu, 1997), a total of 25 international medical science journals were selected from China National Knowledge Infrastructure (CNKI), which is the world's largest database of research content from China (www.cnki.net) (Tang, 2007). In addition, these journals were confirmed as journals in medical science field by two medical science experts at ZMU.

First, in terms of reputation, these selected journals are accepted by prestigious international journals. This fact to a certain extent would help ensure these articles are written in good language and the quality of research reported is highly acceptable. Second, all the journals could be obtained from online database. In the present study, in order to investigate the variations of the move-step structures of MSRAs between HIF journals and LIF journals, 25 international medical science journals were selected according to their impact factor (IF) presented in the year 2014. The IF of these journals ranged from 5.013 to 0.181. Details of the corpus together with their IF and the name of journals for move analysis was shown in Appendices A and B.

3.2.2.2 Selection of Research Articles

Altogether, the corpus used in the present study is 30 MSRAs. During the corpus selection, the researcher went through all the MSRAs available on CNKI, based on the criteria above, only 50 MSRAs meet the requirements. After that the researcher purposively selected 30 MSRAs from the 50 MSRAs, which including 15 RAs from the top highest IF journals and 15 RAs from bottom lowest IF journals. In addition, due to the limitation of the number of RAs that meet the criteria, some RAs were selected from the same journals. Then, 15 MSRAs were selected from the 12 top highest impact factor journals, and 15 MSRAs were selected from the bottom lowest impact factor journals.

To choose these RAs, the following criteria were taken into consideration. First of all, in order to make the corpus comparable, 15 articles were purposefully selected from the top highest IF journals and 15 from the bottom lowest IF journals. First, due to the limited number of MSRAs written by Chinese researchers at ZMU published in international journals, the years of their publication were extended from 2007 to 2015. Second, the authors of the MSRAs were restricted to Chinese writers only and at least one author must come from ZMU. If the author(s) include(s) native speaker(s), those RAs would be discarded. Third, the selection was limited to only the articles with the AIMRD format. The structure of the articles needed to be controlled due to the fact that the structures may differ according to the type of articles (Ozturk, 2007). Since the majority of format of the selected MSRAs

is AIMRD (separate Results (R) and Discussion (D)), the corpus of the present study focused on the AIMRD sections. In spite of the growing frequency of the combined R and D sections in MSRAs, the researcher decided to analyze the articles with separate R and D sections. This was due to the reality that it is important for students to understand and be able to distinguish the distinct functions of R and D sections, even if they ultimately write a combined R and D section (Stoller & Robinson, 2013). Also, the Abstract to be analyzed is confined to only the "unstructured" format (the Abstract follow different move structure such as PMRC, BPMRC and BPRMC) because the "structured" format Abstract already showed the moves of the content, so there was no need to analyze. For these reasons, the selection of the articles was restricted to articles with the AIMRD format. Some articles are also selected if they satisfy one of the following criteria; a) articles with an unlabeled Abstract; b) articles with an unlabeled Introduction; c) articles having the Methods but labeled differently, such as the Methods & Materials). After this careful process of selection, 50 MSRAs met those criteria, then 30 MSRAs are purposively selected from the 50 MSRAs which included 15 RAs were chosen from the top highest IF journals and 15 RAs were chosen from the bottom lowest IF journals. (see Appendices C and D).

3.2.3 Corpus Management

In the present study, all the 30 RAs were purposesively selected from CNKI which were written by Chinese medical science researchers at ZMU. These RAs were firstly downloaded in pdf form and saved into a folder, after that the researcher

printed them out for analysis. The printed RAs were more convenient for the researcher to take note and record the move identification.

For the purposes of move identification and easier access, each article in the two corpora was referred to by the abbreviations H (RAs with HIF journal), and L (RAs with LIF journal). Each section was referred to by the abbreviations A (Abstract), I (Introduction), M (Methods), R (Results), D (Discussion) which was coded by a number (1-15). In the HIF corpus, the RAs were codified from the highest IF to the lowest IF. In the LIF corpus, the RAs were codified from lowest IF to highest IF. For example, the RAs in the second highest IF journal was referred to as H2. The RAs in the tenth lowest IF journal would be coded as L10. All the 30 RAs from each corpus were separately codified H1-H15 for the articles in HIF journals and L1-L15 for the articles in LIF journals. The coding in each section for RAs with HIF was: the Abstract (AH1-AH15); the Introduction section (IH1-IH15); the Methods section (MH1-MH15); the Results section (RH1-RH15); the Discussion section (DH1-DH15). The coding in each section for LIF was: the Abstract (AL1-AL15); the Introduction section (IL1-IL15); the Methods section (ML1-ML15); the Results section (RL1-RL15); the Discussion section: (DL1-DL15). For example, the Results section of the tenth HIF journal corpus was coded as RH10.

3.3 Data Analysis

3.3.1 Frameworks of Move-Step Analysis

Move identification was based on the models of two key previous studies. Anderson and Maclean's (1997) model was followed for analyzing the Abstract, while the IMRD sections were analyzed by adopting Nwogu's (1997) model.

Several reasons for Anderson and Maclean's (1997) framework to be adopted in the present study were explained as follows. First, the field of their study was medicine which was relevant to that of the current study, and this relevance helped avoid the disciplinary variations. Second, this framework provided a very detailed move structure. This model helped researchers have a deep understanding about the distinction of move boundaries between the Purpose and the Methods, the Results and the Conclusion. Third, the corpus in their study was randomly selected from four fields of international medicine journals. Thus, their corpus was representative. Due to the above reasons, Anderson and Maclean's (1997) model was regarded as an appropriate framework for abstract analysis in the present study.

The reasons for Nwogu's (1997) framework to be applied in the present study were explained as follows. First, it is a complete move analysis framework, which examines the pattern of IMRD. Second, the previous studies, as reviewed in Chapter 2, have clearly demonstrated a dependent relationship between move structures and academic disciplines. Nwogu's (1997) model focused on the rhetorical structure in the field of medical science which is relevant to the present study but

Kanoksilapatham's (2005) work focused on the rhetorical structure in the field of biochemistry. In order to avoid possible disciplinary variations, Nwogu's (1997) framework is therefore more appropriate. Third, several previous medical researchers applied Nwogu's (1997) work as model (eg. ElMalik & Nesi, 2008; Li & Ge. 2009; Huang, 2013), thus this fact increases the reliability of this model. Lastly, he claimed that his eleven moves were developed concisely and unambiguously, particularly the Methods and the Results sections which he found reliable and consistent in their usage in the medical field. The findings of his study might help the authors of experimental research to get a better understanding of the overall rhetorical structure of RAs. Based on the above reasons, the move structure obtained from Nwogu's (1997) investigation is proposed as the most relevant framework for the present study.

3.3.2 Move-Step Identification

The frequency of each move in each RAs was recorded in order to verify the extent to which a particular move is used. The criteria for justifying and classifying the frequency of each move was defined based on Kanoksilapatham's (2005) 60% cutting point. According to the criteria, a move is considered to be a conventional move if its frequency reaches 60% or more. If the frequency of occurrence of a move is below 60%, it is considered as an optional move. In addition, the researcher add a new criterion to Kanoksilapatham's (2005), that is, a move is regarded as an obligatory move if its frequency reaches 100%. In the process of move analysis, any

moves/steps not find in Kanoksilapatham's (2005) model and the previous MSRAs would be regarded as new moves/steps.

Swales (1990) states that moves and steps are usually a useful tool for researchers to accomplish communicative purposes of individual sections of RAs. A standard method with four-step procedure for identifying moves is suggested by Holmes (1997) and is summarized by Peacock (2011). The present study followed this four-step procedure of move identification. First, the researcher looked for organization and patterns, and identified moves and boundaries based on the conveyed specific communicative purposes. Second, move identification was based on sentence-level analysis. It is possible that a single sentence could be recognized as a move, or several sentences or even paragraphs could be identified as one move. Third, all sentences that share the same communicative purposes would be assigned to a move. Fourth, in order to avoid subjectivity in the process of move analysis, the inter-coder reliability would be guaranteed by using two coders who analyze the texts independently and then compare their results.

In addition, it is possible that one sentence contains more than one move. That is, one move is embedded in another one. In the case of move embedment, for the Abstract, the sentence is identified as two moves, whereas for the IMRD sections, the sentence is identified as only one move by the central communicative purposes. In the procedure of move analysis involves certain degree of subjectivity which might unavoidable (Holmes, 1997). Meanwhile, some move types may recur cyclical. In

this case, each appearance is counted as an individual instance of that move. Similarly, the rules to identify a move type will be the same as those employed to identify a step in a corpus.

3.3.3 The Inter-Coder Reliability of Move-Step Identification

3.3.3.1 Procedures of Inter-Coder Reliability of Move-Step Identification

During the procedures of identification of moves and steps, it could inevitably suffer from subjective analysis of the text due to human judgment. That would lead to low reliability. To ensure accuracy in the move analysis, the inter-coder reliability was conducted in the present study. Hence, three coders, i.e. the researcher, and two experts, participated in this study. One expert with expertise in genre analysis has a master's degree in English Language Studies. Currently, he is an English teacher in a university in China, and he has supervised a number of English major students in writing bachelor thesis. Another coder is a PhD degree holder who graduated from the School of Foreign Languages at Suranaree University of Technology. She has the academic background of applied linguistics and her research interest is genre analysis of RAs in Marketing and Management. In addition, she is an associate professor of EFL at a university in China, and she has many years of supervision experience in writing bachelor thesis. Therefore, both of these two proposed coders are regarded as academic specialists with sufficient knowledge and competence to provide reliable feedback on move analysis of RAs. According to

Kanoksilapatham (2003), she takes 25% of the entire corpus for assessment of inter-coder reliability. Based on this criterion, 8 RAs were randomly selected from 30 RAs (4 from HIF journals and 4 from LIF journals). In this study, these two coders worked separately, the coder who is a PhD degree holder analyzed 4 MSRAs from HIF journals; whereas the coder with a master degree analyzed 4 MSRAs from LIF journals. The percentage agreement rate was applied to measure the inter-coder reliability of move identification because it is popular and relatively easy to interpret. It can be computed by using the formula:

Agreement rate=A/(A+D) x 100

(where A = the number of agreements; D= the number of disagreements).

For example, if the two coders identify a total of 100 move units, but they only agree 80 times, the percentage agreement rate is 80%. It is worth noting that the satisfactory agreement level of the present study would be 70% following the proposed level by Kwan (2006), because this criteria has been accepted in some previous studies of the similar nature to this present study (e.g., Shi, 2014). In order to reach a high agreement percentage, differences and ambiguities in coding need to be discussed and negotiated between the coders until satisfactory percentage agreement is achieved.

3.3.3.2 Results of Inter-Coder Reliability of Move -Step Identification

Appendix E displayed the results of the inter-coder reliability analysis. In total, eight MSRAs were randomly drawn from the two corpora for checking the reliability of move identification, which reached 84.53% for the HIF journals and 85.24% for the LIF journals corpora, respectively. Although the percentage agreement varied slightly in the two corpora, all exceeded 70% in inter-coder reliability, demonstrating that the researcher can identify moves with a sufficient degree of accuracy. Any disagreement was discussed and negotiated. The re-coding of the disagreed moves is shown in the following excerpts.

Excerpt 1:

*The safety of long-term use of NSAIDs has, however, been questioned, and providing other potential anti-inflammatory treatments for AD remains essential. (*Move 1, Step 2*).* (IH1)

Before discussion, the expert classified this move as Move 2, Step 2: *Refer to the limitations of previous research.* Yet, the researcher considered it as Move 1, Step 2: *Reference to main research problem*. After discussion, the expert agreed with the researcher.

Excerpt 2:

These data suggested that TLR9 signaling could enhance tumor progression in vivo, which might be related to the enhanced proliferation and metastatic potential of tumor cells. (Move10, Step 2). (DH4)

At the beginning, the researcher classified this move as Move 10, Step 1: *Stating a specific outcome.* However, the expert considered it as Move 10, Step 2: *Interpreting the outcome.* After re-coding, the researcher agreed to classify this move is Move 10, Step 2: *Interpreting the outcomes.*

3.4 The Pilot Study

According to Last (2001), a pilot study is a small-scale test of the methods and procedures to be used on a large scale. Pilot study represents a fundamental phase of the research process, and the primary purpose of conducting a pilot study is to examine the feasibility of an approach that is intended to ultimately be used in a large scale study (Leon, Davis, & Kraemer, 2011). In order to insure the reliability and feasibility of the present study, a pilot study is necessary to be conducted. Ten MSRAs with complete AIMRD sections were used. Of these, five RAs were taken from HIF journals and the other five RAs were taken from five LIF journals. In Shi's (2010) study, she analyzed 30 RAs in the field of agriculture science, and 5 RAs were used in her pilot study. Amnuai (2012) studied 60 RAs in Apply Linguistics and only 10 RAs were used for her pilot study. Compare with the previous study, it was believed that such a number of RAs used in the present pilot study would provide an adequate sample for validating the coding scheme and for representing the move-step structures of the RAs used in the main study. In the pilot study, the researcher followed Anderson and Maclean's (1997) work for the Abstract and apply Nwogu's

(1997) framework for the IMRD sections. The criteria of move identification followed the procedures stated in 3.3.2.

3.4.1 Moves of the Abstracts

Based on appendix F, the analysis could conclude that all the five moves *BPMRC* were conventional moves in both corpora. Move 2, Move 4 and Move 5 were the most frequent moves, which were 100% present in both corpora. Move 1 was less frequent, showing up 60% and 80% in the LIF and HIF corpora, respectively. A distinct difference between the two corpora was that Move 3 occurred only 60% in the LIF corpus but 100% presented in HIF corpus, which suggested that the Abstract in HIF corpus tended to use Methods more frequently than the LIF corpus.

It is worth noting that there were two clearly different move patterns, *PRMC* and *BPMRMRC*. The *PRMC* presented move reversal of M4 (*R*) and M3 (*M*) (see Excerpt 3). The *MRMR* pattern was also found, which was consistent with Anderson and Maclean's (1997) work (see Excerpt 4).

Excerpt 3:

Escape latency and searching distance decreased, and the expressions of tumor necrosis factor-(TNF-), interleukin-1 (IL-1) and cyclooxygenase-2 (COX-2) of brain were significantly reduced as observed by real-time RT-PCR and immunohistochemistry (M4). *This study used ibuprofen (40 mg/kg body wt./day) as positive control* (M3). (AH3)

Excerpt 4:

Mice were pretreated with G. lucidum spore (0.1, 0.5, and 1.0 g/kg, po, for 7 days), and subsequently challenged with a hepatotoxic dose of Cd(II) (3.7 mg/kg, ip). Liver injury was evaluated 8 h later (M3). *G. lucidum spore protected against Cd(II)-induced liver injury in a dose-dependent manner, as evidenced by serum alanine aminotransferase, aspartate aminotransferase and histopathology* (M4). *To examine the mechanism of protection, subcellular distribution of Cd(II) was determined* (M3). *G. lucidum spore decreased Cd(II) accumulation in hepatic nuclei, mitochondria, and microsomes, but increased Cd(II) distribution to the cytosol, where Cd(II) is sequestered by metallothionein, a protein against Cd(II) toxicity. stress was also decreased by G. lucidum spore, as evidenced by decreased formation of malondialdehyde* (M4). (AH5)

3.4.2 Moves and Steps of the Introduction Sections

In the Introduction sections, three moves were found in both corpora, including Move 1: *Presenting Background Information*, Move 2: *Reviewing Related Research* and Move 3: *Presenting New Research.* Comparing between the two corpora, Move 1, Move 2 and Move 3 occurred 100% in all RAs. According to Kanoksilapatham's (2005) criteria, all moves found in this section are conventional. It is worth noting that there were two new steps that occurred: Move 2, Step 3: *Generalizations from previous studies* and Move 3, Step 3: *Presenting findings*. These two steps were not present in Nwogu's (1997) framework, but were found in

the Kanoksilapatham's (2005) framework. An important difference was that Move 2, Step 3 was conventional in the HIF corpus but optional in the LIF corpus. The following excerpts showed the new moves or steps.

Move 2, Step 3: ***Generalizations from previous studies.*** This step is used to generalize the conclusions, research gaps or limitations from previous studies.

Excerpt 5:

These events cannot be interpreted only by the mechanism at supraspinal levels, leading us to speculate that some underlying mechanisms involved in the spinal cord and/ or dorsal root ganglion (DRG) might play an important role in LA analgesia. (IH4)

Move 3, Step 3: ***Presenting findings.*** This step provides the main findings of the study.

Excerpt 6:

The results clearly demonstrated G. lucidum spore is effective in protecting against Cd(II) hepatotoxicity, probably through the induction of Metallothionein. (IH5)

3.4.3 Moves and Steps of the Methods Sections

The Methods sections are made of four moves, including Move 4: *Data collection procedure,* Move 5: *Describing experimental procedure,* Move 6: *Presenting equations describing the phenomena or models of the phenomena* and Move 7: *Detailing statistical procedures.* The results showed that Move 4, Move 5

and Move 7 were present 100% in both corpora, whereas Move 6 occurred only 40% and 20% in the HIF and LIF corpora, respectively. Meanwhile, Move 6 and Move 7 were new moves. Move 6 occurred in Shi's (2014) work. Move 7 occurred in Kanoksilapatham's (2005) work. In terms of steps, Move 4, Steps 1 and 3, and Move 5, Steps 1 and 4 were new steps, which corresponded with Kanoksilapatham's (2005) framework. In addition, Move 5, Step 2: *Identifying main research apparatus* is insufficient to explain the apparatus the researchers used in the MSRAs analysis, the authors describe apparatus with providing detailed information such as the name of the manufacture. However, this step is better explained by Move 6: *Detailing Equipment* in Kanoksilapatham's (2005) framework. The following excerpts were the new moves or steps.

Move 4, Step 1: *Listing materials.* This step explicitly lists the materials used in the study, such as animals, chemicals, and drugs.

Excerpt 7:

The nucleotide sequences of the primers used in this study were as follows:A caspase-3(NM_012922):sense50-CAGAGACTGCGGTATTGA-30,antisense50-AGC ATGGCGCAAAGT GACTG-30; B caspase-12(NM_130422): sense50-CTG GCCCTC ATCATCTGCAA-30, antisense50-TGGACGGCCAGCAAACTT-30. (MH2)

Move 4, Step 3: *Background of materials.* This step is used to provide background information about the materials such as features of the materials or selection criteria for the materials.

Excerpt 8:

All other chemicals were commercially available and of reagent grade. (MH5)

Move 5, Step 1: Documenting established procedures. The communicative purpose of this step is to recount an experiment procedure used by previous researchers.

Excerpt 9:

The ICH induction procedure was implemented by the method reported previously [8]. (MH1)

Move 5, Step 2: *Identifying main research apparatus.* This step is better explained by Move 6: *Detailing equipment* in Kanoksilapatham's (2005) framework.

Excerpt 10:

The Morris water maze and BI2000 image analysis system were made in Chengdu by Taimeng Co. (Chengdu, China). (MH3)

Excerpt 11:

After ether inhalation anesthesia, the brain was exposed and the hippocampus was carefully isolated under a microscope. (Nikon, Tokyo, Japan). (ML2)

Move 5, Step 4: *Providing background of procedures.* This step provides the justification for the choice of technique or procedure, the approval for the use of animals or comments on the whole experiment.

Excerpt 12:

The present study was performed with the approval of the ethics committee of he West China Hospital of Sichuan University and all the participants provided vritten informed consent. (ML1)

Move 6: *Presenting equations describing the phenomena or models of the henomena.* This move is used to predict measured variables such as equations or ormula.

Excerpt 13:

Calculation of intracellular calcium was made using the following quation:[Ca2+]i¼Kd[(R-Rmin)(Rmax-R)](Fmin/Fmax). [Kd is the dissociation onstantofFura-2forCa2+and was assumed to be 224nmol/lat37 1C (Grahamand urgoyne, 1994). (MH2)

Move 7: *Detailing statistical procedures.* This move is used to describe the atistical approaches to the analysis of data.

xcerpt 14:

Statistical analyses of the data were performed with the aid of analysis rograms in SPSS12.0 software. Statistical evaluation was performed using One-way nalysis of variance (ANOVA; p<0.05) using the program PRISM 4.0 (GraphPad oftware Inc., San Diego, CA, USA). (ML4)

3.4.4 Moves and Steps of the Results Sections

The Results sections were made of four moves, Move 8: *Stating procedures,* Move 9: *Justifying procedures,* Move 10: *Stating results* and Move 11: *Stating comments on results*. The results revealed that Move 8, Move 10 and Move 11 were conventional move in both corpora, whereas Move 9 occurred only 40% and 20% of the HIF and LIF corpora, respectively. It is noticeable that Move 8, Move 9 and Move 11 are new moves which were accounted for in Kanoksilapatham's (2005) framework. The following excerpts were the new moves or steps.

Move 8: ***Stating research procedures.*** The communicative purpose of the move is to remind readers of the information on the experimental procedures.

Excerpt 15:

In the first series of experiments, the effects of Dendrobium alkaloids alone on cell viability were determined using the MTT assay. (RH2)

Move 9: ***Justifying procedures or methodology.*** This move provides the rationale for the researchers' decision to use particular experimental methods or procedures. This move can be identified by the methods that people used before that can affect the choice of the methods used in the study being reported.

Excerpt 16:

It was revealed that functional inhibition of C5 and the C5a receptor has shown a neuroprotective effect against ischaemia–reperfusion injury in middle cerebral artery occlusion (MCAO) models [26,27]. (RH1)

Move 11: *Stating comments on the results* includes two steps, Step 1: *Making generalizations or interpretations of the results* and Step 2: *Evaluating current findings with previous studies.*

Move 11, Step 1: *Making generalizations or interpretations of the results* is used to interpret the results of the study.

Excerpt 17:

The data suggested that Rg1 could inhibit the VSMC proliferation induced by PDGF-BB through restricting the G0/G1-phase to S-phase progression in cell cycle. (RL5)

Move 11, Step 2: *Evaluating current findings with previous studies.* The communicative purpose of this step is to show the validity and reliability of the results which will help readers accept the findings.

Excerpt 18:

Furthermore, we found that the lung metastatic score of 95D cells but not 95C cells was significantly elevated in CpG ODN treated group compared with the control groups (Fig. 1c), which was consistent with our previous study in vitro [21]. (RL4)

3.4.5 Moves and Steps of the Discussion Sections

In the Discussion sections, there were four moves, Move 12: *Contextualizing the study,* Move 13: *Highlighting overall research outcome,* Move 14: *Explaining specific outcomes* and Move 15: *Stating research conclusions.* All the four moves

were conventional. Move 12 and Move 14 occurred 100% in both corpora, Move 13 was less frequent which occurred 60% in both corpora. Move 15 was present 80% in the HIF corpus but 100% in the LIF corpus. It is worth noting that Move 12 was a new move and Move 11, Steps 1 and 5 were new steps, which was consistent with Kanoksilapatham's (2005) work. In addition, Move 14, Step 6: *Limitation of the outcome* is better explained by Move 14: *Stating the limitations of the study* in Kanoksilapatham's (2005) framework. In some cases, the authors not only claim the limitation of the outcome but also claim the limitation of the methodology. Therefore, Nwogu's (1997) framework was insufficient to explain this step, whereas, Kanoksilapatham's Move 14: *Stating the limitations of the study* seems more appropriate to explain this step.

Move 12, Step 1: *Background information about the study* refers to the established knowledge or previous studies.

Excerpt 19:

LA has been known to possess almost equipotent analgesic activity to morphine, with no addiction, neural or cardiac toxicity at a wide range of concentration (Ameri, 1998; Ono and Satoh, 1988). (DH4)

Move 12, Step 2: *Detailing conclusions, claims, deductions or research gap based on analyses from previous studies* is used to generalize the conclusions or claim research gaps based on analysis from previous studies.

Excerpt 20:

LA was reported to inhibit formalin- and carrageenin-induced thermal hyperalgesia (Liu et al., 1987; Wang et al., 2009b). But it still remains unclear about the potential mechanism of LA exerting suppressive effect on hyperalgesia. (DH1)

Move 12, Step 3*: Restating the aims of the study.* The purpose of this step is to remind readers of the aims of the study.

Excerpt 21:

This study was designed to provide a novel insight into the treatment of ICH via complement and thrombin inhibition. (DH1)

Move 14, Step 1: *Restating the methodology.* This step is achieved by referring to the research procedures.

Excerpt 22:

In this study, C3–/– mice were utilized to explore the mechanism of the protective function and the role of the complement system in the ICH mouse model. (DH1)

Move 14, Step 4: *Evaluating current findings with previous studies.* The communicative purpose of this step is to convince readers of the credibility of the findings.

Excerpt 23:

Reduction of the MWT and TWL was detected in the CCI rats, as was consistent with the result of our previous study (Xiao et al., 2010). (DH4)

Move 14, Step 5: *Stating the value of the study.* This step is used to show the significance of the study.

Excerpt 24:

Thus, this study provides a mechanistic basis for icariin's use in the treatment of brain disorders. (DH3)

Move 14, Step 6: *Claiming the limitation of the outcome.* This step is better explained by Move 14: *Stating limitations of the present study* in Kanoksilapatham's (2005) framework which describes the limitations of the study about the findings or the methodology.

Excerpt 25:

However, anti-thrombin drugs used in mice and humans are different ICH situations, and there are still controversial results and conclusions regarding the function and usage of anti-thrombin drugs. (DH1)

Excerpt 26:

Our study did not take drug resistance into consideration, and it remained unclear whether CD147 in laryngeal carcinoma had correlation with drug resistance or not. (DL3)

Move analysis of the two corpora confirmed the hypothesis about the move-step structure variations of MSRAs between HIF journals and LIF journals because it revealed some similarities and differences in terms of move/step occurrence. That is, for Abstract, all the five moves (*BPMRC*) were conventional in both corpora. In terms of the IMRD sections, HIF or LIF RAs were found to have fifteen moves: three for the Introduction section, four for the Methods section, four for

the Results section and four for Discussion section. However, the variations between the two corpora had given rise to the choices of steps or move frequency. For example, Move 4 Step 2 was conventional in the HIF corpus but optional in the LIF corpus. Move 3 Step 2 was present 40% in HIF corpus but missing in the LIF corpus.

In summary, for the Abstract, most moves followed Anderson and Maclean's (1997) work, therefore, in the main study, the researcher would follow this model. For the IMRD sections, the results showed that there are 15 moves and 30 steps in total (see Appendix G). However, there were 6 new moves and 9 new steps found. Among these, five moves and nine steps were consistent with Kanoksilapatham's (2005) framework (see Appendix H), one move was consistent with Shi's (2014) work. Moreover, almost all the 11 moves in Nwogu's (1997) framework were found in Kanoksilapatham's (2005) framework. It indicated that Nwogu's (1997) framework was insufficient to apply in the present study, whereas Kanoksilapatham's (2005) framework tends to be more appropriate to apply in the present study. This might be due to the structural changes or development of MSRAs over time. Kanoksilapatham's (2005) framework was more updated, whereas Nwogu's (1997) was proposed almost 20 years ago, which was far from the years of the publication of the present corpus from 2007-2015. In addition, Kanoksilapatham's (2005) work also belongs to hard science. Due to the above reasons, the researcher decided to propose Kanoksilapatham's (2005) framework for the analysis in the main study.

3.5 Summary

To sum up, this chapter provides a detailed description of the research methodology used in the present study. In addition, criteria and justification for the selection of data and analytical frameworks and data analysis procedures have been provided. Apart from that, the inter-coder reliability of the move analysis identification was conducted by two experienced experts. Finally, a pilot study has been conducted on the move-step analysis for the complete AIMRD sections at the end of this chapter. The findings from the preliminary study have shown that the selected analysis framework is insufficient to apply in the present study, therefore, the researcher decided to change from Nwogu's (1997) model to Kanoksilapatham's (2005) framework. It has proved that the researcher is equipped with certain research skills and is capable of carrying out the proposed study. In Chapter 4, the Results and Discussion of the move analysis of this study will be presented.

CHAPTER 4

RESULTS

This chapter reports the results of the moves, steps and their structures on AIMRD sections of the English MSRAs. The results are going to answer the following research questions:

1) What are the moves, steps, and their structures of the Abstract, Introduction, Methods, Results, and Discussion in MSRAs written by Chinese researchers at Zunyi Medical University published in the HIF journals and the LIF journals?

2) What are the variations in terms of moves, steps, and their structures of the Abstract, Introduction, Methods, Results, and Discussion of MSRAs between the HIF journals and the LIF journals?

4.1 Moves, Steps and their Structures in High Impact Factor Journals and Low Impact Factor Journals Corpora

To answer the research questions, the move-step structure analysis and comparative analysis were conducted. Two sets of data were compiled, the HIF and the LIF journal corpora. Anderson and Maclean's (1997) and Kanoksilapatham's (2005) frameworks were applied as models for the move analysis of the Abstract and the IMRD sections, respectively. The criteria for justifying and classifying the

frequency of each move were based on Kanoksilapatham's (2005) 60% cutting-off point. In the present study the research adapted this criterion, that is, a move is considered to be an obligatory move if its frequency reaches 100%. A move is regarded as conventional move if its frequency reaches 60% to 99%. If the frequency of occurrence of a move is below 60%, it is considered as an optional move.

Tables 4.1 and 4.2 presented the move-step structure of English medical science research articles written by Chinese researchers in the HIF corpus and the LIF corpus.

Table 4.3 and Table 4.4 showed the moves in the Abstract of the HIF corpus and the LIF corpus. Table 4.5 and Table 4.6 presented the move embedding in the Abstract of the HIF corpus and the LIF corpus.

4.1.1 The Abstract

Table 4.1 Moves of the Abstracts in the HIF Corpus

Coding	M1 B	M2 P	M3 M	M4 R	M5 C
AH_1	1	1	1	1	1
AH_2	1	1	1	1	1
AH_3	/	1	1	1	1
AH_4	/	1	1	1	1
AH_5	1	1	/	1	1
AH6	1	1	1	1	1
AH7	1	1	1	1	1
AH8	1	1	1	1	1
AH9	1	/	1	1	1
AH10	1	1	1	1	1
AH11	/	1	1	1	1
AH12	1	1	1	1	1
AH13	/	1	1	1	1
AH14	1	1	1	1	1
AH15	1	1	1	1	1
Total Moves	11	14	14	15	15
Percentage	73.33%	93.33%	93.33%	100%	100%

Note:

1. M= move
2. AH= Abstract in high impact factor journal corpus
3. B=Background; P=Purpose; M=Methods; R=Results; C=Conclusion

Table 4.2 Moves of the Abstracts in the LIF Corpus

Coding	M1 B	M2 P	M3 M	M4 R	M5 C
AL1	/	1	1	1	1
AL2	1	1	/	1	1
AL3	/	1	1	1	1
AL4	1	1	1	1	1
AL5	1	1	1	1	1
AL6	/	1	1	1	1
AL7	1	1	1	1	1
AL8	/	1	1	1	1
AL9	1	1	1	1	1
AL10	1	/	1	1	1
AL11	/	1	1	1	1
AL12	1	1	1	1	1
AL13	/	1	1	1	1
AL14	1	1	/	1	1
AL15	1	1	1	1	1
Total Moves	**9**	**14**	**13**	**15**	**15**
Percentage	**60%**	**93.33%**	**86.67%**	**100%**	**100%**

Note:

1. M= move
2. AL= Abstract in low impact factor journal corpus
3. B=Background; P=Purpose; M=Methods; R=Results; C=Conclusion

Table 4.3 Move embedding of the Abstracts in the HIF Corpus

Coding	M/P	R/M
AH_1	1	/
AH_2	1	/
AH_3	/	/
AH_4	1	/
AH_5	/	/
AH6	/	/
AH7	/	/
AH8	/	/
AH9	/	/
AH10	1	/
AH11	1	1
AH12	/	/
AH13	1	1
AH14	1	1
AH15	1	1
Total Moves	8	4
Percentage	53.33%	26.67%

Note:

1. AH= Abstract in high impact factor journal corpus
2. P=Purpose; M=Methods; R=Results
3. M/P= Purpose embedded in the Methods; R/M= Methods embedded in the Results

Table 4.4 Move embedding of the Abstracts in the LIF Corpus

Coding	M/P	R/M
AL1	/	/
AL2	/	/
AL3	1	/
AL4	1	/
AL5	1	1
AL6	1	/
AL7	1	/
AL8	/	/
AL9	1	1
AL10	/	/
AL11	1	/
AL12	1	/
AL13	/	/
AL14	/	/
AL15	/	/
Total Moves	8	2
Percentage	**53.33%**	**13.33%**

Note:

1. AL= Abstract in low impact factor journal corpus
2. P=Purpose; M=Methods; R=Results
3. M/P= Purpose embedded in the Methods; R/M= Methods embedded in the Results;

Based on Tables 4.1 and 4.2, the analysis revealed that all the five moves *BPMRC* are conventional moves in both corpora. Move 4 and Move 5 were the most frequent moves, which were 100% present in both corpora. Move 1 was the least frequent move of the five moves, showing up 73.33% and 60% in the HIF corpus and the LIF corpus, respectively. Move 2 and Move 3 were frequently used in both corpora. Move 2 was found 93.33% in both corpora, and Move 3 was found 93.33% in the HIF corpus and 86.67% in the LIF corpus. However, some differences were also found between the two corpora. Move 1 occurred 73.33% in the LIF corpus but

60% in the HIF corpus, which suggested that the Abstract in HIF corpus tended to state the background more frequently than the LIF corpus. Another difference is the frequency of Move 3 in the HIF corpus (93.33%) is slightly higher than in the LIF corpus (86.67%), which indicated that the Abstract in the HIF corpus tended to present methods more often than the LIF corpus.

Excerpt 1:

(B) *Ginsenosides, the active components found in Panax ginseng, have been reported to inhibit the cardiac hypertrophy in rats.* **(P)** *This study aims to observe the potential effect of total ginsenosides (TG) on the hypertrophic vascular diseases.* **(M)** *The model of vascular neointimal hyperplasia was established by rubbing the endothelia of the common carotid artery with a balloon in male Sprague Dawley rats. TG (15 mg/kg/day, 45 mg/kg/day), L-arginine (L-arg) 200 mg/kg/day, and NG-nitro-L-arginine-methyl ester (L-NAME) 100 mg/ kg/day used with the same dose of L-arg or TG 45 mg/kg/day were given for 7 and 14 consecutive days after surgery.* **(R)** *TG and L-arg administrations significantly ameliorated the histopathology of injured carotid artery, which was abolished or blunted by L-NAME, an NOS inhibitor; TG and L-arg could also remarkably reduce the expression of proliferating cell nuclear antigen (PCNA), a proliferation marker of vascular smooth muscle cells (VSMCs), in neointima of the injured artery wall. Further study indicated that balloon injury caused a decreased superoxide dismutase (SOD) activity and elevated malondialdehyde (MDA) content in plasma, and reduced the cGMP level in the artery*

wall, which were reversed by TG. **(C)** *It was concluded that TG suppress the rat carotid artery neointimal hyperplasia induced by balloon injury, which may be involved in its antioxidative action and enhancing the inhibition effects of NO/cGMP on VSMC proliferation* (AH7)

Based on Tables 4.3 and 4.4, it is worth noting that evidence of move embedding was identified, which was consistent with Anderson and Maclean's (1997) work. In total, two types of move embedding were found, including *Purposes* embedded in *Methods* (*M/P*), and *Methods* embedded in *Results* (*R/M*). The frequency of these two types of move embedment was quite similar, indicating that both the HIF corpus and LIF corpus shared a common feature of move embedding in the Abstract.

Excerpt 2:

(B) *The medicinal fungus Ganoderma lucidum has been shown to have hepatoprotective effects. G. lucidum contains triterpenes and polysaccharides, and the Sporoderm-broken G. lucidum powder is particular beneficial.* **(M)** *This study utilized G. lucidum spore to examine its effect on [Cd(II)]-induced hepatotoxicity in mice and the mechanism of the protection. Mice were pretreated with G. lucidum spore (0.1, 0.5, and 1.0 g/kg, po, for 7 days), and subsequently challenged with a hepatotoxic dose of Cd(II) (3.7 mg/kg, ip). Liver injury was evaluated 8 h later. G. lucidum spore protected against Cd(II)-induced liver injury in a dose-dependent manner, as evidenced by serum alanine aminotransferase, aspartate*

aminotransferase and histopathology. **(M/P)** *To examine the mechanism of protection, subcellular distribution of Cd(II) was determined.* **(R)** *G. lucidum spore decreased Cd(II) accumulation in hepatic nuclei, mitochondria, and microsomes, but increased Cd(II) distribution to the cytosol, where Cd(II) is sequestered by metallothionein, a protein against Cd(II) toxicity.* **(R/M)** *Indeed, G. lucidum spore induced hepatic metallothionein-1 mRNA 8-fold, and also increased metallothionein protein as determined by the Cd(II)/hemoglobin assay.* **(R)** *Cd(II)-induced oxidative stress was also decreased by G. lucidum spore, as evidenced by decreased formation of malondialdehyde.* **(C)** *In summary, G. lucidum spore is effective in protection against Cd(II)-induced hepatotoxicity, and this effect is due, at least in part, to the induction of hepatic metallothionein to achieve beneficial effects.* (AH15)

4.1.2 The Introduction Section

In the Introduction sections, 3 moves and 10 steps were found in both corpora, including **Move 1: *Presenting background information,*** **Move 2: *Reviewing related research*** and **Move 3: *Presenting new research.*** Comparing between the two corpora, Move 1 and Move 3 occurred 100% in both corpora and the researcher defined them as obligatory moves. However, Move 2 occurred less frequently, which was present 80% in the HIF journal corpus, but only 53.33% in the LIF journal corpus. According to Kanoksilapatham's (2005) criteria, Move 2 was conventional move in the HIF corpus, but optional move in the LIF corpus. Table 4.5 displayed the moves and steps of MSRA Introduction sections.

Table 4.5 Moves and Steps of MSRA Introduction Sections

Move/Step	Frequency of Occurrence (%)	
	HIF Corpus (N=15)	LIF Corpus (N=15)
Introduction		
Move 1: Stating why the topic is worth investigating	**15 (100%)**	**15 (100%)**
Step 1: Claiming the importance of the topic	9 (60%)	7(46.67%)
Step 2: Making topic generalizations	15 (100%)	15(100%)
Step 3: Reviewing previous research	15 (100)	14 (93.33%)
*Step 4: Generalizations from previous studies	10 (66.67%)	3 (20%)
Move 2: Preparing for the present study	**12 (80%)**	**8 (53.33%)**
Step 1: Indicating a gap	12 (80)	6(40%)
Step 2: Raising a question	2 (13.33%)	2(13.33%)
Move 3: Introducing the present study	**15 (100%)**	**15 (100%)**
Step 1: Stating purpose(s)	14 (93.33%)	13 (86.67%)
Step 2: Describing procedures	6 (40%)	1 (6%)
Step 3: Presenting findings	4 (26.67%)	3(20%)
*Step 4: Stating the value of the present study	7(46.67%)	3(20%)

Note:

1. HIF= the high impact factor journal
2. LIF= the low impact factor journal
3. N=the total number of analyzed RA Methods sections in this study
4. %= the frequency of occurrence of a move/step
5. * = new move or step
6. M= move; S= step

Move 1: ***Stating why the topic is worth investigating.*** The major communicative purposes of this move are to present the background knowledge of the study being reported and to claim the importance and rationale of the present study. Move 1 contains 3 steps, including **Step 1:** ***Claiming the importance of the topic***; **Step 2:** ***Making topic generalizations*** and **Step 3:** ***Reviewing the previous research.*** Move 1 WAs obligatory move in both corpora. The realization of Move 1, Steps 1-3 were illustrated in the following excerpts.

Move 1, Step 1: ***Claiming the importance of the topic*** is used to state why the topic is important and worth conducting. This step was realized by the phrases such as *play an important role, have been known to play a role* and *play a major part* to show the importance of the topic. This step was found 60% and 46.67% in the HIF corpus and LIF corpus, respectively. Therefore, Move 1, Step 1 was conventional in the HIF corpus but optional move in the LIF corpus.

Excerpt 3:

Although the underlying cause of AD is very complex and far from fully understood, it is widely acknowledged that genetic risk factors ***play an important role*** *in the incidence of AD (Gatz et al., 2006; Rogaev et al., 1995; Sherrington et al..1995).* (IH2)

Move 1, Step 2: ***Making topic generalizations*** serves to present the general knowledge about the present study. This step was obligatory step in both corpora. It showed that the Chinese medical science researchers prefer to provide the general knowledge of the study being reported to indicate that the reported research is based on a thorough knowledge of the subject under study, which makes their RAs more convincing and persuasive in the first place. Clearly, the phrases such as *was widely used* and *has been regarded as* are the salient linguistic indicators to introduce this step.

Excerpt 4:

Lipopolysaccharide (LPS), a bacterial endotoxin, ***is widely used to*** *produce neuroinflammation, either by systemic injection, intraventricular microinjection or*

chronic infusion, or by incubation with brain cells (Hauss-Wegrzyniak et al., 1998; Kim et al., 2000; Kitazawa et al., 2005). (IH1)

Move 1, Step 3: ***Reviewing the previous research*** is to review the previous studies which are relevant to the study being reported. The function of Step 3 was realized by the reporting verbs such as *reported, proposed* and *described*. In addition, another key feature of this step is that citations always occur in this step. The frequency of this step was extremely high in both corpora, which was present 100% and 93.33% in HIF corpus and LIF corpus, respectively. Both the HIF and the LIF Introductions almost always have Move 1, Step 3: *Reviewing the previous studies*, which is possible to explain that Chinese medical science researchers prefer to convince readers of the importance of the topic by reviewing the previous research.

Excerpt 5:

It has been ***reported that*** ox-LDL induced ROS formation in ECs (Zmijewski et al., 2005; Cominacini et al., 1998, 2000, 2001), VSMCs (Chien et al., 2001) and bovine articular chondrocytes (Nishimura et al., 2004). (IH8)

Move 1, Step 4: ***Generalizations from previous studies*** is a new step. It offers the conclusions, research gaps or limitations from previous studies. The frequency of this step in the HIF corpus (66.67%) was greater than the LIF corpus (20%), which indicated that the HIF corpus was more likely to state the conclusions, research gaps or limitations from previous studies compared with the LIF corpus.

Excerpt 6:

These events cannot be interpreted only by the mechanism at supraspinal levels, leading us to speculate that some underlying mechanisms involved in the spinal cord and/ or dorsal root ganglion (DRG) might play an important role in LA analgesia. (IH14)

Move 2: *Preparing for the present study*. The communicative purposes of this move are to show the weakness of the previous studies and to assert that a particular research problem demands to be solved. Unlike Moves 1 and 3 which were present 100%, the occurrence of Move 2 was less frequent, being found with 80% in the HIF corpus and only 53.33% in the LIF corpus, respectively. In addition, the results also showed that this move was conventional in the HIF corpus but optional in the LIF corpus. The higher frequency of this move in the HIF corpus seemed to indicate that claiming research gaps in the MSRA Introduction is necessary. There are two strategies in Move 2, which are **Step 1: *Indicating a gap*** and **Step 2: *Raising a research problem.*** The realization of Move 2, Steps 1 and 2 is illustrated in Excerpts 7–8.

Move 2, Step 1: *Indicating a gap* states the insufficiency of the previous research in the area of the study being reported. The frequency of this step in the HIF corpus (80%) was two times greater than the LIF corpus (40%). Further analysis indicated that the HIF corpus probably needs to include a statement of indicating research gaps. The most distinct linguistic signals of this step contain the connector words such as *however, while* and *whereas* and the negative words such as *little, but, few* and *limited.*

Excerpt 7:

However, *it remains unknown about the detailed characteristics of CDR3 length repertoire in peripheral blood of healthy people.* (IH4)

Move 2, Step 2: ***Raising a research problem*** has the function to indicate a problem needing a solution and the demand for the investigation of the study being reported. This step is the least frequent step in the present study, which occurred only 13.33% in both corpora. The finding demonstrated that the Chinese medical science researchers of the HIF corpus tend to present the Introduction section without raising research problems. To achieve the function of this step, the linguistic indicators include the phrases *has been questioned* and *the more serious problems*.

Excerpt 8:

The safety of long-term use of NSAIDs, however, ***has been questioned****, and providing other potential anti-inflammatory treatments for AD remains essential.* (IH13)

Move 3: ***Introducing the present study.*** The communicative purpose of this move is to fill up the gaps or to announce the solution to the problem identified in Move 2. Move 3 was obligatory in both corpora. There are four steps to achieve this move, **Step 1:** ***Stating purposes;*** **Step 2:** ***Describing procedures***; **Step 3:** ***Presenting findings*** and **Step 4:** ***Stating the value of the present study***. The frequency of Move 3, Step 1 was 93.33% and 86.67% in the HIF and the LIF corpus, respectively, which was higher than that of Move 3, Steps 2, 3 and 4. It is possible that the major communicative purpose of Move 3 is to state the research purposes. In addition,

most Chinese researchers prefer to keep the methodology and research findings later in the Methodology and Results sections. It is worth noting that Move 4: *Stating the value of the present study* is a new step in these MSRAs.

Move 3, Step 1: *Stating purpose* is to state objectives of the study and this step is the major step in Move 3. The function of this step was realized by the linguistic indicators such as *purposes, aims, attempt,* and *objectives.*

Excerpt 9:

*This study was **aimed** at addressing the effects of Dendrobium alkaloids on rat primary cultured neurons subjected to oxygen-glucose deprivation/reperfusion (OGD/RP), in an attempt to find a new multifunctional cytoprotective agent to treat ischemic brain vascular diseases.* (IH11)

Move 3, Step 2: *Describing procedures* is to state the main procedural features of the study being reported. It is worth noting that the frequency of this step in the HIF corpus (40%) was higher than in the LIF corpus (6%). This phenomenon probably explained that the Introduction in the HIF corpus provides details that how the research activities were conducted to attract readers to read further. This step was marked by the linguistic indicators such as *used, applied, developed, examined, collected, measured* and *performed.*

Excerpt 10:

*We **developed** an A/R model using adult cardiomyocytes freshly isolated from rat to mimic the IR microenvironment in vivo.* (IH9)

Move 3, Step 3: ***Presenting findings*** has a function to show the selected findings of the study. However, this step occurred with a low frequency in both corpora. The possible explanation is that the Chinese medical science researchers prefer to leave the results in the later Results section, which could lead readers to be curious about what the results were and how the results were obtained and motivate them to read further. The communicative purpose of this step was achieved by the linguistic indicators such as *results* and *findings.*

Excerpt 11:

The ***results*** *clearly demonstrated G. lucidum spore is effective in protecting against Cd(II) hepatotoxicity, probably through the induction of Metallothionein.* (IH5).

Move 3, Step 4: ***Stating the value of the present study*** aims to state the contribution and significance of the research. It is worth noting that this step is a new step and occurred with higher frequency in the HIF corpus (46.67%) than in the LIF corpus (20%). The results revealed that the Introductions in the HIF tend to place more emphasis on highlighting their own research than in the LIF corpus. The identification of this step was realized by the use of the phrases such as *provide a novel insight into, provide basic data* and *provide scientific basis.*

Excerpt 12:

The results would ***provide the basic data*** *for investigating TCR gene recombination, and CDR3 pedigree drift in disease state.* (IH14)

4.1.3 The Methods Section

The Methods section was made of five moves, including **Move 4: *Describing materials*, Move 5: *Describing experimental procedures*, Move 6: *Detailing equipment*, Move 7: *Presenting equations*** and **Move 8: *Describing statistical procedures.*** The frequencies of Moves 5, 6, 7 and 8 were quite similar. That is, Move 5 was obligatory in both corpora. Move 6 and Move 8 were conventional in both corpora. A salient difference between the two corpora is that the occurrence of Move 7 is much less frequent, being found only 20% in the HIF corpus and 13.33% in the LIF corpus, respectively. Meanwhile, Move 7 is a new move, which was not found in Kanoksilapatham's (2005). It is worth noting that Move 4 was obligatory in HIF corpus but conventional in LIF corpus. In addition, Move 6 and Move 8 were conventional in the present study but optional in the discipline of biochemistry under Kanoksilapatham's (2005) investigation. Table 4.6 showed the moves and steps of MSRA Methods section.

Table 4.6 Moves and Steps of MSRA Methods Section

Move/Step	Frequency of Occurrence (%)	
	HIF (N=15)	LIF (N=15)
Methods		
Move 4: Describing materials	**15 (100%)**	**13 (86.67%)**
Step 1: Listing materials	7 (46.67%)	3 (20%)
Step 2: Detailing the source of the materials	15 (100%)	10 (66.67%)
Step 3: Providing the background of the materials	4 (26.67)	7 (46.67%)
Move 5: Describing experimental procedures	**15 (100%)**	**15 (100%)**
Step 1: Documenting established procedures	13 (86.67%)	8 (53.33%)
Step 2: Detailing procedures	15 (100%)	15 (100%)
Step 3: Providing the background of the procedures	10 (66.67%)	6 (40%)
Move 6: Detailing equipment	**13 (86.67%)**	**10 (66.67%)**
***Move 7: Presenting equations**	**3 (20%)**	**2 (13.33%)**
Move 8: Describing statistical procedures	**14 (93.33%)**	**12 (80%)**

Note:

1. HIF= the high impact factor journal
2. LIF= the low impact factor journal
3. N=the total number of analyzed RA Methods sections in this study
4. %= the frequency of occurrence of a move/step
5. * = new move or step
6. M= move; S= step

Move 4: *Describing materials.* Move 4 was obligatory in the HIF corpus but conventional in the LIF corpus, apparently indicating that it is important to list materials when the Chinese medical science researchers write the Methods section. The function of this move was achieved by three steps, including **Step 1: *Listing materials*, Step 2: *Detailing the source of the materials*** and **Step 3: *Providing the background of the***

materials. Steps 1 and 3 were much less frequent so they were optional in both corpora. However, the occurrence of Step 2 was much higher, being obligatory in the HIF corpus and conventional in the LIF corpus.

Move 4, Step 1: *Listing materials* explicitly lists the materials used in the study, such as *animals, chemicals, and drugs*. This step was optional in both corpora.

Excerpt 13:

The nucleotide sequences of the primers used in this study were as follows:A caspase-3(NM_012922):sense50-CAGAGACTGCGGTATTGA-30,antisense50-AGCAT GGCGCAAAGT GACTG-30; B caspase-12(NM_130422): sense50-CTG GCCCTC ATCATCTGCAA-30, antisense50-TGGACGGCCAGCAAACTT-30. (MH2)

Move 4, Step 2: *Detailing the source of the materials.* The major communicative purpose of this step is to provide the information about how the materials were obtained such as being purchased from a company or contribution by an institute or organization. The occurrence of Step 2 was much higher, being found obligatory and conventional in the HIF corpus and the LIF corpus, respectively. It could be indicated that the Chinese medical science researchers prefer to state where the materials were obtained from to show the good quality of their materials and to increase the validity and reliability of their research. In addition, it provides a guideline for the later researchers who want to replicate this experiment.

Excerpt 14:

Star anise and fennel samples were ***purchased*** *from Parkn-Shopsupermarket (Guangzhou, China).* (MH3)

Move 4, Step 3: ***Background of materials.*** This step is used to provide background information about the materials such as features of the materials or selection criteria for the materials.

Excerpt 15:

All other chemicals were commercially available and of reagent grade. (MH5)

Move 5: ***Describing experimental procedures.*** This move was obligatory in both corpora. Providing the details of the experimental procedures might help those readers who would like to know how the results came out, or the researchers who want to follow this procedure to conduct similar research. This move was present with three steps in both corpora, including **Step 1:** ***Documenting established procedures,*** **Step 2:** ***Detailing procedures*** and **Step 3:** ***Providing the background of the procedures.*** Step 2 was obligatory in both corpora. However, Steps 1 and 3 were conventional in the HIF corpus but optional in the LIF corpus.

Move 5, Step 1: ***Documenting established procedures.*** The communicative purpose of this step is to recount a well-established experiment procedure used by previous researchers. This step was prevalent in the HIF corpus, as 86.67% RAs in the HIF corpus included it, while only 53.33% of the LIF corpus did. The findings suggested that the Methods sections of MSRAs in the HIF corpus are more likely to

document the established procedures to increase the validity of the research than the LIF corpus.

Excerpt 16:

The ICH induction procedure was implemented by the method reported previously [8]. (MH1)

Move 5, Step 2: Detailing procedures. The function of this step is to provide the details of the experimental procedures. This step was obligatory in both corpora, which indicated that Chinese medical science researchers always state research procedures when they write Move 5.

Excerpt 17:

Confluenced ECs cells were exposed to different concentrations of ox-LDL (50, 100, 150 μg/ml) for 18 h and the morphological changes were first observed by an inverted microscopy. (ML2)

Move 5, Step 3: *Providing background of procedures.* This step provides the justification for the choice of technique or procedure, the approval for the use of animals or comments on the whole experiment. This step was conventional in the HIF corpus but optional in the LIF corpus, which probably showed that the Chinese medical science researchers of the HIF corpus prefer to offer the justification for the choice of the procedures more than those in the LIF corpus.

Excerpt 18:

The present study was performed with the approval of the ethics committee of the West China Hospital of Sichuan University and all the participants provided written informed consent. (ML1)

Move 6: *Detailing equipment.* This move provides detailed information of apparatus such as *the name of manufacture*. This move was conventional in both corpora (86.67%, 66.67%), while optional in biochemistry investigated by Kanoksilapatham's (2005) (10%). It is possible to show that disciplinary variations will affect the frequency of a certain move.

Excerpt 19:

After ether inhalation anesthesia, the brain was exposed and the hippocampus was carefully isolated under a microscope. (Nikon, Tokyo, Japan). (ML2)

Move 7: *Presenting equations.* This move is used to present equations used in calculating the data straightforwardly to the readers.

Excerpt 20:

Calculation of intracellular calcium was made using the following equation:[Ca2+]i¼Kd[(R-Rmin)(Rmax-R)](Fmin/Fmax). [Kd is the dissociation constantofFura-2forCa2+and was assumed to be 224nmol/lat37 1C (Grahamand Burgoyne, 1994). (MH2)

Move 8: *Detailing statistical procedures.* This move is used to describe the statistical approaches to the analysis of data. The presentation of this move was quite frequent in both corpora (93.33, 80%). However, this move infrequently occurred in the previous studies, which was found only 63.33% in the discipline of agriculture science (Shi, 2010) and 13.32% in the discipline of biochemistry (Kanoksilapatham, 2005). This result can indicate that the medical science researchers tend to present the statistical procedures more frequently than those in the agricultural science and biochemistry. That helps confirm that the disciplinary variations play an important role in move frequency.

Excerpt 21:

Statistical analyses of the data were performed with the aid of analysis programs in SPSS12.0 software. Statistical evaluation was performed using One-way analysis of variance (ANOVA; $p<0.05$) using the program PRISM 4.0 (GraphPad Software Inc., San Diego, CA, USA). (ML4)

4.1.4 The Results Section

The Results sections are made of four moves, **Move 9: *Stating procedures,*** **Move 10: *Justifying procedures,*** **Move 11: *Stating results*** and **Move 12: *Stating comments on results*.** The results revealed that Move 10 was optional in both corpora. Move 11 was obligatory in both corpora. Move 9 was obligatory in the HIF corpus but conventional in the LIF corpus. Move 12 was conventional in the HIF corpus but optional in the LIF corpus. Table 4.7 demonstrated the moves and steps of MSRA Results section.

Table 4.7 Moves and Steps of MSRA Results Section

Move/Step	Frequency of Occurrence (%)	
	HIF	LIF
Results		
Move 9: Stating procedures	**15 (100%)**	**12 (80%)**
Step 1: Describing purposes	8 (53.33%)	4 (26.67%)
Step 2: Listing procedures or methodological techniques	15 (100%)	11 (73.33%)
	5 (33.33%)	**4 (26.67%)**
Move 10: Justifying procedures or methodology	4 (26.67%)	3 (20%)
Step 1: Citing established knowledge of the procedure	2 (13.33%)	2 (13.33%)
Step 2: Referring to previous research	**15 (100%)**	**15 (100%)**
Move 11: Stating results	**13 (86.67%)**	**8 (53.33%)**
	12 (80%)	8 (53%)
Move 12: Stating comments on the results		
Step 1: Making generalizations or interpretations of the results	4 (26.67%)	1 (6%)
Step 2: Evaluating the current findings	6 (40%)	2(13.33%)
Step 3: Summarizing		

Note:

1. HIF= the high impact factor journal
2. LIF= the low impact factor journal
3. N=the total number of analyzed RA Results sections in this study
4. %= the frequency of occurrence of a move/step
5. M= move; S= step

Move 9: ***Stating research procedures.*** The communicative purpose of this move is to remind readers that how and why the data of the study was obtained. There are two steps in this move, including **Step 1:** ***Describing purposes*** and **Step 2:** ***Listing procedures or methodological techniques***. However, Step 2 was obligatory in the HIF corpus but conventional in the LIF corpus. The possible explanation is the

Results section in the HIF corpus seems to prefer to offer detailed experimental procedures to help those researchers who would like to replicate these methods more than the LIF corpus. It is interesting that procedures occurred again in the Results section and this issue will be discussed in the Discussion section.

Move 9, Step 1*: Describing purposes* states the research purposes of the study. Step 1 was optional in both corpora. This step was characterized by linguistic indicators such as *to examine, to investigate* and *to test.*

Excerpt 22:

We next investigated whether miR-126 silencing could influence the suppressive activity of Tregs. (RH5)

Move 9, Step 2*: Listing procedures or methodological techniques* provides procedures or methodology used in the study being reported. One interesting phenomenon is that Move 9, Step 1 often co-occurred with Move 9, Step 2.

Excerpts 23:

To investigate the possible role of miR-126 on CD4+Foxp3+ regulatory T cells (Tregs) **(Move 9, Step 1),** *we first detected the expression level of miR-126 in Tregs by Real-time PCR assay* **(Move 9, Step 2).** (RH8)

Excerpt 24:

In the first series of experiments, the effects of Dendrobium alkaloids alone on cell viability were determined using the MTT assay. (RH2)

Move 10: ***Justifying procedures or methodology.*** This move provides the rationale for the researchers' decision to use particular experimental methods or procedures. This move can be achieved by two steps, including **Step 1:** ***Citing established knowledge of the procedure*** and **Step 2:** ***Referring to previous research.*** This move was the least frequent move in the Results section, which was found in 33.33% and 26.67% of the HIF corpus and the LIF corpus, respectively.

Move 10, Step 1: ***Citing established knowledge of the procedure*** is to state the methods or procedures that Chinese medical science researchers used before, which will increase the credibility of the procedures and gain acceptance from the larger scientific community.

Excerpt 25:

AbPP is a type I transmembrane protein whose functions and metabolic processing have been implicated in the pathogenesis of AD. (RH1)

Step 2: ***Referring to previous research*** is to claim whether this method or procedure yielded successful results in the previous studies.

Excerpt 26:

It was revealed that functional inhibition of C5 and the C5a receptor has shown a neuroprotective effect against ischaemia–reperfusion injury in middle cerebral artery occlusion (MCAO) models [26, 27]. (RH1)

Move 11: ***Stating results.*** The communicative purpose of this move is to highlight the results obtained from the study. The occurrence of this move was 100%

in both corpora, indicating that the central theme of the Results section is to state the results of the study.

Excerpt 27:

The results of the haplotype distribution are shown in Table 3. Four haplotypes derived from rs2274567, rs3737002, and rs6691117 were found. Only the CR1 ''ATG'' haplotype showed had a 1.6-fold increased risk of LOAD (OR ¼ 1.610, 95 % CI = 1.158e2.239, p = 0.005). (RH2)

Move 12: ***Stating comments on the results*** included three steps, **Step 1:** ***Making generalizations or interpretations of the results*****,** **Step 2:** ***Evaluating current findings with previous studies*** and **Step 3:** ***Summarizing results.***

Move 12, Step 1: ***Making generalizations or interpretations of the results*** is used to interpret the results of the study. Move 12, Step 1 was conventional in the HIF corpus but optional in the LIF corpus. This step was signaled by the tentative statements or modal verbs such as *suggested, indicated, might* and *would.*

Excerpt 28:

The data ***suggested*** *that Rg1 could inhibit the VSMC proliferation induced by PDGF-BB through restricting the G0/G1-phase to S-phase progression in cell cycle.* (RL5)

Move 12, Step 2: ***Evaluating current findings with previous studies.*** The communicative purpose of this step is to show the validity and reliability of the results which will help readers accept the findings by revealing the similarities and

differences between the study being reported and previous studies. The frequency of Move 12, Step 2 was higher in the HIF corpus (26.67%) than in the LIF corpus (6%). Another distinct finding is that Move 12, Step 2 often co-occurred with Move 11.

Excerpt 29:

Moreover, the level of phosphorylation of Akt and phosphorylation of mTOR increased significantly in miR-126 ASO-transfected group compared with those in control group (Fig. 5A) **(Move 11)**, *indicating that miR-126 could regulate the activation of PI3K/Akt pathway in Tregs (***Move 12, Step 2).** (RH5)

Excerpt 30:

Furthermore, we found that the lung metastatic score of 95D cells but not 95C cells was significantly elevated in CpG ODN treated group compared with the control groups (Fig. 1c), which was consistent with our previous study in vitro [21]. (RL4)

Move 12, Step 3: ***Summarizing the results.*** The function of this step is to summarize the overall results of the study. The occurrence of Move 12, Step 3 was slightly more frequent in the HIF corpus (40%) than in the LIF corpus (13.33%). This step was marked by some summarizing and concluding words such as *taken together, in summary, it is conclude* and *in brief.*

Excerpt 31:

***Taken together**, these findings indicate that the inhibition of LPSinduced production of TNF-a and TNFR1 by SPRC or IBU is mediated, at least partly, by suppressing LPS-induced IjB-a degradation and thereafter activation of NF-jB.* (RH1)

4.1.5 The Discussion Section

In the Discussion sections, there are four moves, **Move 13:** ***Contextualizing the study,*** **Move 14:** ***Explaining specific outcomes*****, Move 15:** ***Stating limitations of the study*** and **Move 16:** ***Stating research conclusions.*** Move 13 and Move 14 occurred 100% in both corpora, while, Move 15 was less frequent, which was optional in both corpora. The occurrence of Move 16 was nearly obligatory in both corpora, which was present 100% in the HIF corpus and 93.33%% in the LIF corpus. Table 4.8 presented the moves and steps of MSRA Discussion sections.

Table 4.8 Moves and Steps of MSRA Discussion Sections

Move/Step	Frequency of Occurrence (%)	
	HIF	**LIF**
Discussion		
Move 13: Contextualizing the study	**15 (100%)**	**15 (100%)**
Step 1: Describing established knowledge	14(93.33%)	5 (33.33%)
Step 2: Presenting generalizations, claims, deductions, or research gaps	8 (53.33%)	7 (46.67%)
Step 3: Stating research aims	4 (26.67%)	3 (20%)
Move 14: Consolidating results	**15 (100%)**	**15 (100%)**
Step 1: Restating methodology (purposes, research questions, hypotheses restated, and procedures)	9 (60%)	5 (33.33%)
Step 2: Stating selected findings	15 (100%)	15 (100%)
Step 3: Evaluating current findings with previous studies	14 (93.33%)	9 (60%)
Step 4: Explaining differences in findings	4 (26.67%)	3 (20%)
Step 5: Making overt claims or generalizations	12 (80%)	12 (80%)
Step 6: Stating value of the present study	4 (26.67%)	3 (20%)
Move 15: Stating limitations of the study	**8 (53.33%)**	**3 (20%)**
Step 1: Limitations about the findings	4 (26.67%)	2 (13.33%)
Step 2: Limitations about the methodology	8(53.33%)	3 (20%)
Move 16: Stating research conclusions	**15 (100%)**	**14 (93.33%)**
Step 1: Implications	15 (100%)	14 (93.33%)
Step 2: Suggestions for further research	8 (53.33%)	8 (53.33%)

Note:

1. HIF= the high impact factor journal
2. LIF= the low impact factor journal
3. N=the total number of analyzed RA Discussion sections in this study
4. %= the frequency of occurrence of a move/step
6. M= move; S= step

Move 13: ***Contextualizing the study*** is to provide the information about the context of the study being reported. It includes **Step 1:** ***Describing established knowledge,*** **Step 2:** ***Presenting generalizations, claims, deductions, or research gaps*** and **Step 3:** ***Stating research aims.***

Move 13, Step 1: ***Describing established knowledge*** refers to the established knowledge or previous studies to help readers to have sufficient background knowledge to understand the Discussion section. A distinct difference is that Move 13, Step 1 was present more frequently in the HIF corpus (93.33%) than in the LIF corpus (33.33%). This difference likely implied that the Discussion sections in the HIF corpus prefer to present the background information of the study being reported than those in the LIF corpus.

Excerpt 32:

LA has been known to possess almost equipotent analgesic activity to morphine, with no addiction, neural or cardiac toxicity at a wide range of concentration (Ameri, 1998; Ono and Satoh, 1988). (DH4)

Move 13, Step 2: ***Detailing conclusions, claims, deductions or research gap*** is used to generalize the conclusions or claim research gaps based on analysis from previous studies. Move 13, Step 2 was optional in both corpora. In addition, this step was present more frequently in the HIF corpus (53.33%) than that in the LIF corpus (46.67%). It is possible to indicate that in the HIF corpus Chinese medical science researchers seemed more likely to generalize the conclusions or research gaps of previous studies than the LIF corpus.

Excerpt 33:

LA was reported to inhibit formalin- and carrageenin-induced thermal hyperalgesia (Liu et al., 1987; Wang et al., 2009b). But it still remains unclear about the potential mechanism of LA exerting suppressive effect on hyperalgesia. (DH1)

Move 13, Step 3*: Stating the aims of the study.* The purpose of this step is to remind readers of the aims of the study. The occurrence of this step was quite low, which was found only in 26.67% and 20% of the HIF corpus and LIF corpus.

Excerpt 34:

This study was designed to provide a novel insight into the treatment of ICH via complement and thrombin inhibition. (DH1)

Move 14: Consolidating results is to highlight the strengths of the study being reported and convince the readers that the research is successful. This move was realized by six steps, **Step 1: *Restating methodology*** (purposes, research questions, hypotheses restated, and procedures), **Step 2: *Stating selected findings*, Step 3: *Evaluating current findings with previous studies*, Step 4: *Explaining differences in findings*, Step 5: *Making overt claims or generalizations*** and **Step 6: *Stating value of the present study.*** Move 14, Step 2 was obligatory in both corpora. Move 14 Steps 3 and 5 were conventional in both corpora. Move 14, Steps 4 and 6 were optional in both corpora. It is worth noting that the frequency of Move 14, Step 3 was much higher in the HIF corpus (93.33%) than in the LIF corpus (60%). This finding indicated that the MSRAs in the HIF corpus tend to compare the results of the study

being reported with previous studies to convince the readers of the credibility of the results. Another salient difference is that Move 14, Step 1 was conventional in the HIF corpus but optional in the LIF corpus. The possible explanation is that the MSRAs in the HIF corpus prefer restating methodology before showing the selected findings than the LIF corpus.

Move 14, Step 1: ***Restating the methodology.*** This step is achieved by referring to the research procedures.

Excerpt 35:

In this study, C3–/– mice were utilized to explore the mechanism of the protective function and the role of the complement system in the ICH mouse model. (DH1)

Move 14, Step 2: ***Stating selected findings.*** This step is to highlight the selected findings of the study. The presentation of this step occurred 100% in both corpora. It indicates that stating selected findings is the central communicative purpose of the Discussion section.

Excerpt 36:

The study revealed that C5aR reached maximum expression 3 days after ICH induction (Fig. 1), in which a time– course of C5aR expression was localized and up-regulated on microglia (Fig. 2a). (DH10)

Move 14, Step 3: ***Evaluating current findings with previous studies.*** The communicative purpose of this step is to convince readers of the credibility of the

findings by comparing between the study being reported and previous studies. This step was realized by the phrases such as *be consistent with and be similar to* and *agree with.*

Excerpt 37:

Reduction of the MWT and TWL was detected in the CCI rats, as ***was consistent with*** *the result of our previous study (Xiao et al., 2010).* (DH4)

Move 14, Step 4: ***Explaining differences in findings.*** The function of this step is to explain the differences between two sets of data or the differences between the study being reported and previous studies. The occurrence of this step was quite low, which was found 26.67% and 20% in the HIF corpus and LIF corpus, respectively.

Excerpt 38:

Our study got similar results but had a relatively lower apoptosis rate. The possible explanation might be our doses used were much lower than theirs (100, 150, 200 μg/ml). (DH8)

Move 14, Step 5: ***Making overt claims or generalizations.*** This step functions to interpret and generalize the findings of the study. This step appeared to be important in MSRAs as the occurrence of this step was quite high, which was found 80% in both corpora. This step was signaled by the modal verbs such as *suggest, seem* and *indicate*.

Excerpt 39:

Our results ***suggest*** *that ox-LDL could not only increase O2 − production but also induce H2O2 formation.* (DH8)

Move 14, Step 5: ***Stating the value of the study.*** This step is used to show the significance and implications of the study. This step was marked by the key words such as *help, valuable, useful, significant* and *important* or the phrases included *provide a novel insight, provide a theoretical framework* and *provide a scientific data.*

Excerpt 40:

Furthermore, those data serve as a ***valuable*** *resource to* ***help*** *us describe novel gene expression profiles and ultimately classify genes.* (DR5)

Move 15: ***Stating limitations of the present study,*** which describes the limitations about the findings or the methodology of the study. There are two steps in this move: **Step 1:** ***Limitations about the findings*** and **Step 2:** ***Limitations about the methodology.*** Move 15, Steps 1 and 2 were optional step in both corpora. As for move frequency, it was found 53.33% in the HIF corpus but only 20% in the LIF corpus. This demonstrated that Chinese medical science researchers might avoid claiming the limitations of their studies.

Move 15, Step 1: ***Limitations about the findings.*** This step was present infrequently in both corpora.

Excerpt 41:

However, anti-thrombin drugs used in mice and humans are different ICH situations, and there are still controversial results and conclusions regarding the function and usage of anti-thrombin drugs. (DH1)

Move 15, Step 2: *Limitations about the methodology.* This step was optional in both corpora. The linguistic indicators of this step were *remain unclear, fail to* and *limited.*

Excerpt 42:

Our study did not take drug resistance into consideration, and it ***remained unclear*** *whether CD147 in laryngeal carcinoma had correlation with drug resistance or not.* (DL3)

Move 16: ***Stating research conclusions*** is the last Move in the MSRAs. The communicative purpose of this move is to summarize the researchers' views on the contributions which the study has made to the field, and it may also indicate a need for further research. This move was realized by **Step 1: *Indicating research implications*** and **Step 2: *Promoting further research.***

Move 16, Step 1: *Indicating research implications* presents the contribution to the study. Step 1 appeared to be important in MSRAs as it was observed in 100% of the HIF corpus and 93.33% of the LIF corpus.

Excerpt 43:

These data provided a novel insight on the functional role of miR-126 in Tregs and might help for the development of new therapeutic strategy based on Tregs for promoting Tcell immunity–related disease. (DH5)

Move 16, Step 2: *Promoting for further research* claims the need for future research based on the limitations or research findings of the present study.

Excerpt 44:

To help elucidate the substantial roles of CR1 polymorphisms in the etiology of LOAD, further studies are needed to investigate how these 2 SNPs influence the structure of the gene itself and to focus on the structure and function of the encoded protein in LOAD patients. (DH2)

4.2 The variations of the move-step structure between the HIF corpus and the LIF corpus

The results of both the HIF corpus and the LIF corpus were similar in terms of their move structures. In the Abstract section, five moves were found in both the HIF corpus and the LIF corpus including *Background*, *Purpose*, *Methods*, *Results* and *Discussion*. For the IMRD sections, 16 moves were found including three moves in the Introduction section, five moves in the Methods section, four moves in the Results section and four moves in the Discussion section. However, some differences regarding the move frequency of the IMRD sections in the two corpora were revealed.

For example, the move frequencies of some moves were different between the two corpora. That is, first, **Move 1, Step 1:** ***Claiming the importance of the topic***, **Move 1, Step 4:** ***Generalizations from previous studies***, **Move 2, Step 1:** ***Indicating a gap***, **Move 5, Step 1:** ***Documenting established procedures***, **Move 12:** ***Stating comment on results*** and **Move 13, Step 1:** ***Background information about the study*** were conventional in the HIF corpus but only optional in the LIF corpus. Second, **Move 4, Step 2:** ***Detailing the source of the materials*** and **Move 9:** ***Stating procedures*** were obligatory in the HIF corpus but conventional in the LIF corpus. Third, **Move 3, Step 2:** ***Describing procedures***, **Move 3, Step 4:** ***Stating the value of the present study***, **Move 5, Step 3:** ***Providing background*** and **Move 15:** ***Stating limitations of the present study*** were more frequently used in the HIF corpus than the LIF corpus.

These differences could be explained by different factors. Firstly, the MSRAs in the HIF corpus may find it more effective to attract the readers' attention through highlighting the importance of the topic than the LIF corpus, so **Move 1, Step 1:** ***Claiming the importance of the topic*** was conventional in the HIF corpus but optional in the LIF corpus. Secondly, since the MSRAs in the HIF corpus realized more the importance of stating the conclusions, research gaps or limitations from previous studies, **Move 1, Step 4:** ***Generalizations from previous studies*** was conventional in the HIF corpus but optional in the LIF corpus. Thirdly, it seemed that claiming research gaps is more necessary in the Introduction section of the HIF corpus, thus, **Move 2, Step 1:** ***Indicating a gap***, was conventional in the HIF corpus

but optional in the LIF corpus. Fourthly, providing brief information that how the research activities were conducted and placing more emphasis on highlighting the values of their own research to attract readers to read further and to attract the attention for the publication are considered significant by the MSRAs in the HIF corpus than in the LIF corpus, hence **Move 3, Step 2:** ***Describing procedures*** and **Move 3, Step 4:** ***Stating the value of the present study*** were more frequently used in the HIF corpus than the LIF corpus. Fifthly, the Chinese medical science researchers in the HIF corpus prefer to state where the materials used in the the experiments were obtained to show the good quality of their materials and to increase the validity and reliability of their research than the LIF corpus, so **Move 4:** ***Describing materials*** and **Move 4, Step 2:** ***Detailing the source of the materials*** were more frequently employed in the HIF corpus than the LIF corpus. Sixthly, in order to make their research more interesting to attract the attention for publication, the Chinese medical science researchers in the HIF corpus employed **Move 5, Step 1:** ***Documenting established procedures,*** **Move 5, Step 3:** ***Providing background of the procedures,*** **Move 12:** ***Stating comment on results*** and **Move 13, Step 1:** ***Background information about the study*** than those researchers in the LIF corpus. Next, since the authors in the HIF corpus find it necessary to remind the readers of the background information of the study which includes research purposes and methodologies before reporting results and making comments on the results, **Move 9:** ***Stating procedures*** was obligatory in the HIF corpus but conventional in the LIF corpus. Lastly, the

Chinese medical science researchers in the HIF corpus regarding highly stating the limitations of their studies to show their carefulness and honesty to the academic research, **Move 15*: Stating limitations of the present study*** was found more frequently used in the HIF corpus than the LIF corpus.

4.3 Summary

In summary, in total five moves were found in the Abstract section including *Background* (*B*), *Purpose* (*P*), *Methods* (*M*), *Results*(*R*) and *Discussion* (*D*) in both the HIF corpus and the LIF corpus. There are 16 moves in the IMRD sections. In the Introduction three moves were found including, **Move 1: *Stating why the topic is worth investigating***; ***Move 2: Preparing for the present study*** and **Move 3: *Introducing the present study*.** The Methods section contained five moves, **Move 4: *Describing materials*; Move 5: *Describing experimental procedures*; Move 6: *Detailing equipment*; Move 7: *Presenting equations*** and **Move 8: *Describing statistical procedures*.** The Results sections were made of four moves including, **Move 9: *Stating procedures*; Move 10: *Justifying procedures or methodology*; Move 11: *Stating results*** and **Move 12: *Stating comments on the results*.** There were four moves identified in the Discussion section, **Move 13: *Contextualizing the study*; Move 14: *Consolidating results*; Move 15: *Stating limitations of the study*** and **Move 16: *Stating research conclusions*.** Some interesting points were found in the present study regarding the similarities and differences of the move/step frequency

between the HIF corpus and the LIF corpus and between the present study and the previous studies. The detailed comments on and interpretations of those interesting points would be discussed in Chapter 5

CHAPTER 5

DISCUSSION AND CONCLUSION

This chapter consists of two parts: the Discussion and the Conclusion. In the Discussion part, the relationship between the results of the present study and those from previous studies and the variations of the move-step structures between the two corpora will be discussed. In the Conclusion part the researcher will discuss the Pedagogical Implications and the Limitations of the present study.

5.1 Discussion

5.1.1 The moves, steps, and their structures of the HIF corpus and the LIF corpus

One of the major purposes of this study is to identify the moves, steps and their structures of Abstract, Introduction, Methods, Results, and Discussion sections in MSRAs with the HIF journals and the LIF journals written by Chinese researchers at ZMU. The discussion and interpretation of results will be presented from the Abstract to the Discussion section.

The results of the Abstract in the present study showed that both the HIF corpus and the LIF corpus followed the *B P M R C* format, which was mostly consistent with previous studies (e.g. Weissberg and Buker, 1990; Anderson and

Maclean, 1997; Swales and Feak, 2004). Another similarity was that the three moves *PMR* were frequently used in the present study and previous studies such as in the field of applied linguistics under Santos's (1996) and Pho's (2008) investigations. They claimed that approximately 80% of writers used M 2 (P), M 3 (M), and M 4 (R).

However, some variations were also found. *B* was conventional (77.33% in the HIF corpus and 60% in the LIF corpus) in the present study and in the field of medical science (Anderson and Maclean, 1997) and obligatory in English MSRAs written by English native speakers (Juan and Tao, 2013), but optional in educational technology (Pho, 2008) and in applied linguistics (Santos, 1996). M 4 (*R)* was obligatory in both corpora in the present study but it was present 80% both in the field of applied linguistics under Santos's (1996) and Pho's (2008) investigations. *C* was present 100% in the present study but only 67% in applied linguistics and in educational technology (Pho, 2008) and 53% in applied linguistics (Santos, 1996), and absent in TESOL, applied linguistics and language learning (Tseng, 2011). Those results tend to indicate that the MSRA Abstracts prefer to use *B* and *C* than some disciplines in the soft science.

Move embedment was found both in the present study and Anderson and Maclean's (1997). In total, two types of move embedded were found, including *Purposes* embedded in *Methods* (*M/P*) and *Methods* embedded in *Results* (*R/M*). However, the move embedment was not reported in applied linguistics (Santos, 1996), educational technology (Pho, 2008), TESOL, applied linguistics and language

learning (Tseng, 2011). This result indicated that the medical science researchers are more likely to combine *Purposes* into *Methods* and *Methods* into *Results* when they write an abstract.

In the present study, the three moves found in the Introduction section were consistent with previous studies (e.g. Nwogu, 1997; Posteguillo, 1999; Kanoksilapatham, 2005; Shi, 2010; Shi, 2014). However, some differences were revealed in terms of the frequency of moves or steps and the choice of steps. The first of these substantial differences is the application of **Move 1: *Stating why the topic is worth investigating.*** In the present study, this move was present 100% in both corpora, but this move was present only 46.67% in Nwogu's (1997) and 44% in the corpus A (published from the year of 1985 to 1989) and 96% in the corpus B (published from the year of 2000 to 2004) in Li and Ge (2009). This result showed that the present day medical science researchers tend to provide more background information to show that the study being reported is based on well established knowledge, which increases the credibility of the research. The second salient difference is the employment of **Move 1, Step 1: *Claiming the importance of the topic.*** That is, this step was present 60% in the HIF corpus and 46.67% in the LIF corpus of the present study, but 100% in the field of agricultural science under Shi's (2010) investigation. It apparently indicated that the medical science researchers do not always claim the importance of the topic like the agricultural science did. The third significant difference is the application of **Move 1, Step 2: *Making topic***

generalizations and **Move 1, Step 3: *Reviewing previous studies.*** That is, Move 1, Step 2 was present 100% in both corpora but only 65.5% in computer science analyzed by Posteguillo (1999). **Move 1, Step 3: *Reviewing previous studies*** was present 100% in the HIF corpus and 93.33% in the LIF corpus but only 75% in computer science investigated by Posteguillo (1999). The results convinced that the medical science researchers prefer to generalize the topic knowledge of the study being reported and review the relevant previous research more than the computer science researchers do. The possible explanation for those two differences might be because the shorter history of computer science at that time, and before 1999 the computer science researchers had very few previous studies to review, thus, making the small occurrence of this step in past 1999. However, the computer science in recent years has more studies than before, therefore, it could be easier for the nowadays computer science researchers to review the previous studies. The fourth discrepancy is **Move 1, Step 4: *Generalizations from previous research.*** That is, this step was a new step in the present study which was found 66.67% in the HIF corpus and 20% in the LIF corpus. However, this step was absent in MSRAs analyzed by previous researchers (e.g. Nwogu, 1997; Li and Ge, 2009), in biochemistry (Kanksilapatham, 2005), and in agricultural science (Shi, 2010). Thus, this step is the typical step for MSRAs written by Chinese medical science researchers at ZMU. The fifth distinctive difference is **Move 3, Step 3: *Presenting findings.*** This step was present only 26.67% in the HIF corpus and 20% in the LIF

corpus and absent in educational psychology (Loi, 2010) and applied linguistics (Wannaruk and Amnuai, 2016). On the contrary, there is a frequent application of this step (70%) in computer science (Posteguillo, 1999). This finding showed that the present day RAs prefer to keep the findings and then present them in the later Results section. This could be because the present day readers read more quickly than before, and later sections are usually skipped. To withhold the findings in the later section is a strategy to force readers to go through the whole story of the RAs. By doing so, the readers can have a comprehensive understanding of how the results were obtained, and the results could be more convincing and persuasive. The last interesting point is **Move 3, Step 4:** ***Stating the value of the present study.*** This step is a new step which was present 46.67% in the HIF corpus and 20% in the LIF corpus but absent in previous medical science (Nwogu, 1997; Li and Ge, 2009), computer science (Posteguillo, 1999), biochemistry (Kanoksilapatham, 2005) and agriculture science (Shi, 2010). This clearly indicated that nowadays Chinese medical science researchers prefer to claim the contribution of the study being reported at the beginning of RAs to attract the public attention. In doing so, their RAs are more likely to be accepted by larger scientific communities.

Some differences were found in the Methods section. The first different point is **Move 4*: Describing materials.*** This move was frequently present in the present study, occurring 100% in the HIF corpus and 86.67% in the LIF corpus. That was consistent with previous studies. For instance, this move always occurred in

agricultural science RAs (Shi, 2014) and biochemistry RAs (Kanoksilapatham, 2005). This might be due to the fact that hard sciences usually deal with experiments, so Move 4 was frequently used. However, this move is often absent in soft science disciplines such as in management (Lim, 2006), applied linguistics and educational technology (Pho, 2008). This could be because research in soft science usually depends on the non-experimental methods (Shi, 2014). The second striking difference is **Move 6: *Detailing equipment.*** This move frequently occurred (86.67% in the HIF corpus; 66.67% in the LIF corpus) in the present study but only showed up 10% in the field of biochemistry (Kanoksilapatham, 2005). The possible explanation is that the medical science researchers prefer to show where the equipment was obtained from to increase the validity and reliability of their research. In addition, it provides a guideline for the later researchers who want to replicate this experiment in terms of the equipment used. The third discrepancy is **Move 7: *Presenting equations.*** In addition to in agricultural science (Shi, 2010; Shi, 2014), this move was a new move in the present study but it was absent in Nwogu (1997), Kanoksilapatham (2005) and Lim (2006). This result revealed that the present day medical science researchers and agricultural science researchers prefer to present equations straightforwardly to the readers than the previous medical science, the biochemistry, and the management researchers. This could be because the experiment in medical science field usually deals with patients and lab animals, so the researchers have to be more serious with the results. Providing the equations will help readers understand more clearly how the

numerical data were obtained. In addition, the later researchers who will do a similar experiment can apply this equation as well. The last salient difference is **Move 8:** ***Describing statistical procedures.*** This move frequently occurred in the present study (93.33% in the HIF corpus; 80% in the LIF corpus) but only 63.33% in agricultural science (Shi, 2010) and 13.32% in biochemistry (Kanoksilapatham, 2005). This could be due to the fact that the experiments in medical science usually involve patients and animals, which attribute to the uncertainty. To reduce the uncertainty and improve the accuracy of the medical science research, it is really necessary to apply the statistical procedures in medical science research. Another important reason for the frequently use of Move 8 is the technology advancement in the field of medical science which leads to the growing complexity of the methods and statistics used.

By comparing the Results section of the present study with previous studies, some similarities and differences were found. For the similarities, the previous studies showed that ***Move 11: Stating results*** and ***Move 12: Making comments on results*** are two common moves in the Results section (e.g. Nwogu, 1997; Posteguillo, 1999; Williams, 1999; Kanoksilapatham, 2005; Shi, 2010; Shi, 2014, Wannaruk and Amnuai, 2016). **Move 11:** ***Stating results*** was obligatory in the present study which agreed with previous studies (e.g. Nwogu, 1997; Kanoksilapatham, 2005; Shi, 2010; Shi, 2014, Wannaruk and Amnuai, 2016) and conventional (77.27%) in computer science (Posteguillo, 1999). **Move 12:** ***Stating comments on the results*** was conventional in the HIF corpus of the present study, which was consistent with previous studies (e.g. Shi, 2010; Kanoksilapatham, 2005; Shi, 2014; Wannaruk and Amnuai, 2016). These two results indicated that the major communicative purposes of

the Results section in both hard science and soft science are not only to report results but also comment on results. Besides, it also strongly suggested that these two strategies seem to be shared by RAs in the field of both hard science and soft science. However, some differences were also found. **Move 9: *Stating procedures*** was frequently present in the present study (100% in the HIF corpus; 80% in the LIF corpus) which was consistent with agricultural science (Shi, 2010; Shi, 2014) but absent in the MSRAs conducted by Nwogu (1997). This could be because the present day medical science researchers are more aware of the importance of careful restatement of the experimental procedures in that it can remind the readers the research aims and research methods to help readers have a good connection between the Methods section and the Results section. Therefore, the readers could understand well how those results were obtained. In addition, it can avoid the possible doubts about the results and the interpretations. **Move 10: *Justifying procedures or methodology*** can be claimed to be a unique feature of the Results section in medical science in the present study, biochemistry (Kanoksilapatham, 2005) and agricultural science (Shi, 2010; Shi, 2014). However, this move was absent in social science (Brett, 1994), the previous medical science (Nwogu, 1997; Williams, 1999), computer science (Posteguillo, 1999) and applied linguistics (Yang and Allison, 2003; Wannaruk and Amnuai, 2016). The possible explanation is that there are many established experimental procedures in the field of the present day medical science, biochemistry and agricultural science, therefore, it is very important to claim that the results were obtained from a justifiable method to increase the validity and credibility of those research results.

Moving on to the last section, the MSRAs Discussion section in this study was imilar and distinguished from previous studies in several noteworthy ways. Firstly, **Move 13:** ***Contextualizing the study*** was obligatory in both corpora of the present study but conventional in biochemistry (89.94%) (Kanoksilapatham, 2005), agricultural science (78% in the local Chinese corpus; 87% in the international corpus) (Shi, 2014), and optional in applied linguistics (Yang and Alison, 2003; Wannaruk and Amnuai, 2016) and computer science (13.23%) (Posteguillo, 1999). The higher frequency of this move in the present study indicated that the medical science researchers were more likely to find it necessary to present background information of the research being reported in the Discussion section to prepare readers with sufficient background information to help readers understand the Discussion well than researchers in biochemistry, agricultural science, applied linguistics and computer science. Secondly, **Move 13, Step 3:** ***Stating research aims*** was present in the current study. This step mirrors the purposes in **Move 3:** ***Presenting the present study*** in the Introduction section. However, this step was not found in Kanoksilapatham (2005). This result tended to indicate that the Chinese medical science researchers find it important to remind readers of the research aims. Thirdly, **Move 14:** ***Consolidating results*** was obligatory in the present study, biochemistry (Kanoksilapatham, 2005) and agricultural science (Shi, 2014). Three steps, i.e. **Move 14, Step 3:** ***Evaluating current findings with previous studies*****, Move 14, Step 4:** ***Explaining differences in findings*** and **Move 14, Step 5:** ***Making overt claims and generalizations of the***

findings were consistent with previous studies, such as in applied linguistics (Yang and Alison, 2003; Wannaruk and Amnuai, 2013), educational technology (Pho, 2008), agricultural science (Shi, 2010; Shi, 2014); biochemistry (Kanoksilapatham, 2005) and medical science (Basturkmen, 2012). This result could make a conclusion that the main function of the Discussion section of RAs is to comment on results by evaluating current findings with previous research and accounting and interpreting the results. Fourthly, **Move 14, Step 2: *Stating selected findings*** occurred with the highest frequency (100%) in both corpora. This finding corresponded with previous findings (Yang and Alison, 2003; Shi, 2010; Basturkmen, 2012; Shi, 2014; Wannaruk and Amnuai, 2016). This could be due to the fact that when researchers make comments and evaluations of the study, those comments must be related to the specific results. Fifthly, **Move 14, Step 6: *Stating value of the present study*** was absent in Shi (2010) and Kanoksiapatham (2005). It seemed that the Chinese medical science researchers preferred to emphasize the contribution of their own research than the agricultural science and biochemistry researchers. This could be because the Chinese medical science researchers try to attract the attention to the publication by stating the value of their own research. Lastly, **Move 16: *Stating research conclusions*** includes two steps, **Step 1: *Implications*** and **Step 2: *Suggestions for further research.*** This was consistent with the previous medical science research (Nwogu, 1997; Li and Ge, 2009). However, **Move 16, Step 1: *Implications*** was absent in Posteguillo (1999), Kanoksilapatham (2005), Shi (2010), Basturkmen (2012)

and Shi (2014). These results revealed that within the field of medical science the two steps are important elements in the Discussion of medical science which might not be as important as in other disciplines. **Move 16, Step 2: *Suggestions for further research*** was optional in the present study which was consistent with previous studies (e.g. Nowogu, 1997; Posteguillo, 1999; Yang and Alison, 2003; Kanoksilapatham, 2005; Shi, 2010; Basturkmen, 2012; Wannaruk and Amnuai, 2013; Shi, 2014). This could be due to the intense competition among researchers. The researchers are reluctant to show what directions the future research could take because they themselves want to conduct that research in the future and they would like to save the idea for their own research.

5.1.2 The variations of move-step structures between the HIF corpus and the LIF corpus

Based on the results reported above, both the HIF corpus and the LIF corpus consist of 16 moves, however, some similarities and differences regarding the move frequency of the RAs in the two corpora were found.

Based on Tables 4.1 and 4.2, the analysis could conclude that all the five moves *BPMRC* were conventional moves in both corpora and there was no distinctive difference between the two corpora. Only Move 1 (Background) and Move 3 (Methods) were slightly more frequent in the HIF corpus than the LIF corpus, which suggested that the Abstract in the HIF corpus tended to state the background and methods more frequently than the LIF corpus.

Noticeably, five issues found in the Introduction were worth mentioning. First, **Move 1, Step 1:** ***Claiming the importance of the topic*** was found 60% and 46.67% in the HIF corpus and the LIF corpus, respectively. This demonstrated that the HIF corpus seemed to favor this step more than the LIF corpus. This could be because the HIF corpus tended to interest readers through highlighting the importance of the topic more than the LIF corpus. Second, **Move 1, Step 4:** ***Generalizations from previous studies*** in the HIF corpus (66.67%) was far greater than the in LIF corpus (20%). The more frequent use of this move among the Chinese medical science researchers in the HIF corpus presumably indicated that the HIF corpus was more likely to state the conclusions, research gaps or limitations from previous studies when compared with the LIF corpus. Third, **Move 2, Step 1:** ***Indicating a gap*** was found with 80% in the HIF corpus which was two times greater than the in the LIF corpus (40%). The higher frequency of this move in the HIF corpus seemed to indicate that the Chinese medical science researchers in the HIF corpus prefer to make a research space to increase the competitiveness of their research. Fourth, **Move 3, Step 2:** ***Describing procedures*** was present 40% in the HIF corpus which was much higher than in the LIF corpus (6%). This phenomenon probably explained that the Introduction in the HIF corpus provides more detailed information that how the research activities were conducted to attract readers to read further than the LIF corpus does. Last, **Move 3, Step 4:** ***Stating the value of the present study*** was a new step, and this step occurred with higher frequency in the

HIF corpus (46.67%) than in the LIF corpus (20%). The results revealed that the Introductions in the HIF tend to place more emphasis on highlighting the values of their own research right in the Introduction than in the LIF corpus. One possible reason is the Chinese medical science researchers in the HIF corpus were more aware of the importance of stating the value of their own research to attract the attention of the publication.

There are four interesting points in the Methods section. First, **Move 4:** ***Describing materials*** was obligatory in the HIF corpus but conventional in the LIF corpus, apparently indicating that the Chinese medical science researchers showed greater preference for describing materials. This could be because the Chinese medical science researchers are aware that it is important to describe materials in the Methods section. Second, the occurrence of **Move 4, Step 2:** ***Detailing the source of the materials*** was obligatory in the HIF corpus but conventional in the LIF corpus. It could indicate that the Chinese medical science researchers in the HIF corpus prefer to state where the materials were obtained from to show the good quality of their materials and to increase the validity and reliability of their research. In addition, it provides a guideline for the later researchers who want to replicate this experiment. Third, **Move 5, Step 1:** ***Documenting established procedures*** was prevalent in the HIF corpus, as 86.67% RAs in the HIF corpus included it, while only 53.33% of the LIF corpus did. The findings suggested that the Methods section of MSRAs in the HIF corpus are more likely to document the established procedures to increase the

credibility and validity of the methods used in the reported research than in the LIF corpus. Last, **Move 5, Step 3:** ***Providing background of procedures*** was more frequently used in the HIF corpus than the LIF corpus. Presumably, it might be that the Chinese medical science researchers of the HIF corpus prefer to offer the justification for the choice of the procedures to attract the interest of professional readers and to suggest that the methods employed are appropriate in the reported research or are widely accepted (Li and Ge, 2009).

There are two key points that would be discussed in the Results section. First, **Move 9:** ***Stating procedures*** was obligatory in the HIF corpus but conventional in the LIF corpus. This indicated that the Chinese medical science researchers in the HIF corpus prefer to remind readers of the background information of the study which includes research purposes and methodologies before reporting results and making comments on the results. Second, **Move 12:** ***Stating comment on results*** was conventional in the HIF corpus but optional in the LIF corpus. This could be because the Chinese medical science researchers in the HIF corpus prefer to make comments on the results when they are reporting results to make their research more interesting to attract the attention of publication. In doing so, their RAs are more likely to be accepted by the larger scientific community.

There are three major points in the Discussion section. First, **Move 13, Step 1:** ***Background information about the study*** was present nearly three times greater in the HIF corpus (93.33%) than in the LIF corpus (33.33%). This difference strongly

implied that the Discussion section in the HIF corpus prefer to present the background information of the study being reported to help readers have sufficient background knowledge to understand the Discussion section. Second, it is worth noting that the frequency of **Move 14, Step 3:** ***Evaluating current findings with previous studies*** was much higher in the HIF corpus (93.33%) than in the LIF corpus (60%). This finding indicated that the Chinese medical science researchers in the HIF corpus tend to evaluate the similarities and differences of the results of the study being reported with previous studies to convince the readers of the credibility of the results. The last distinguished difference is the frequency of **Move 15***: Stating limitations of the present study.* This move was more frequent (53.33%) in the HIF corpus than the LIF corpus (20%). This demonstrated that the Chinese medical science researchers in the HIF corpus were more likely to show the limitation of their studies. This could be a strategy for the Chinese medical science researchers to show their carefulness and honesty to the academic research by acknowledging the limitations of their studies.

5.2 Conclusion

5.2.1 Implications

Based on the findings of the present study, the important implications could be drawn and presented. First, the framework identified in the present study may offer a valuable resource in the form of a rhetorical model for assisting writing instructors to help their students produce effective MSRAs. Thus, it might remind

textbooks designers and writing instructors of the existing gaps between what they provide for learners and what students need to know about the writing of MSRAs. Second, investigating the variations of MSRAs between those in the HIF corpus and the LIF corpus might help Chinese researchers increase the awareness of the different move-step structures between the two sets of corpus. This could help novice Chinese researchers better understand how to produce the MSRAs more effectively and appropriately to meet the conventions of high impact factor international medical science journals. Last, apart from raising students' awareness of the rhetorical moves/steps and their structure of the MSRAs in the HIF corpus and the LIF corpus as stated above, the concrete activities adopting the findings of the present study should be employed in MSRAs writing classroom. There are some practical strategies that can put the findings into practice. For example, the researcher would like to design a thirty-eight hour academic writing course for medical science students in ZMU. This thirty-eight hour course includes the first two hours for teaching students the genre knowledge focusing on the relationship between the communicative purposes and the moves, steps and structures of RAs, and thirty four hours for teaching students how to identify the moves in the Abstract (two hours for this part) and 16 moves in the IMRD sections which were found in the present study (two hours for one move). When the researcher teaches students the Abstract and each move, the following activities will be involved. Firstly, the researcher will provide the proposed model identified in the present study and select

some MSRAs that are published from the HIF journals and the LIF journals as teaching materials, and the researcher should direct students' attention to the conventional and optional move/step as found in the sample materials (30 minutes). In so doing, students will realize what moves/steps are important and should be included in their RAs. Secondly, the researcher may ask students to discuss about the communicative purposes and linguistic signals of each move/step (1 hour). Take **Move 2, Step 1:** ***Indicating a gap*** as an example. This step contains the connector words such as *however, while* and *whereas. (**However,** it remains unknown about the detailed characteristics of CDR3 length repertoire in peripheral blood of healthy people*). By doing so, the students' awareness of linguistic features typical of tis moveand step is raised, and hopefully they will have some apparent linguistic resources for composing this move. Next, the researcher will show students some examples about the similarities and differences of the move frequency between the HIF corpus and the LIF corpus (30 minutes). For instance, in the Discussion section, the move frequency of **Move 13, Step 1:** ***Background information about the study*** was present nearly three times greater in the HIF corpus (93.33%) than in the LIF corpus (33.33%). This difference strongly implied that the Discussion section in the HIF corpus prefer to present the background information of the study being reported to help readers have sufficient background knowledge to understand the Discussion section. With this activity, students can be aware of the similarities and differences in terms of move-step structure from those MSRAs published in the HIF journals and

the LIF journals. For the last two hours, the researcher will ask students to analyze the move-step structure of complete MSRAs and then students can negotiate their findings with their classmates. By doing so, students can better understand the sequence of the construction of the MSRAs and it can help students familiar with this genre and ease the difficulties gradually in writing MSRAs. The researcher will encourage students to compose their own RAs and the practical writing activities will take place in the next teaching stage or in a subsequent course. All of those activities will help students compose their MSRAs more effectively and making their MSRAs more acceptable by the HIF international medical science journals.

5.2.2 Limitations

In summary, after analyzing the moves, steps and their structures of the HIF corpus and the LIF corpus, a modified model was proposed. Hopefully, this proposed model will help with writing and teaching writing of MSRAs for future medical science researchers and teachers at ZMU and other universities in China with similar context. However, some limitations of the present study might have an impact on the generalization of the results. Therefore, those limitations should be addressed.

Firstly, due to the limited number of international publications of Chinese medical science researchers at ZMU, the corpus size of the present study is not very big. In total, 30 MSRAs were purposively selected from 25 international medical science journals. Therefore, the findings of the present study may be not generalizable to other universities in China.

Secondly, the move-step structure analysis focuses on the MSRAs with the AIMRD structure only. Therefore, the results of the present study only fit the RAs with the AIMRD format and the future researcher who would like to apply this result to RAs with different format should be cautioned.

Lastly, the present study was based on the text analysis of MSRAs only and do not include the interview data from the actual authors of the MSRAs into the discussion of the results. Consequently, the ideas of the actual difficulties that the writers met and how they perceived the variations of the moves, steps and their structures between the two corpora remain unknown. Therefore, if the researcher could interview the writers of the MSRAs face to face, the findings of the present study would be more insightful and comprehensive.

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APPENDICES

APPENDIX A

The Coding of the Research Articles in the High Impact Factor Journals Corpus from the Highest Impact Factor Journals to the Lowest Impact Factor Journals

Coding	Year	IF (2014)	Journal Name
H1	2010	5.889	Brain, Behavior, and Immunity
H2	2014	5.013	Neurobiology of Aging
H3	2014	4.169	Journal of Chromatography
H4	2007	4.112	Cellular & Mocular Immunology
H5	2013	4.014	Journal of Cellular and Molecular Medicine
H6	2014	3.973	Bone
H7	2010	3.635	Vascular Pharmacology
H8	2007	3.635	Vascular Pharmacolog
H9	2015	3.516	Oxidative Medicine and Cellular Longevity
H10	2013	3.278	Clinical & Experimental Immunology
H11	2009	3.126	Phytomedicine
H12	2014	3.126	Phytomedicine
H13	2010	3.126	Phytomedicine
H14	2011	3.009	Neurochemistry International
H15	2012	2.895	Food and Chemical Toxicology

APPENDIX B

The Coding of the Research Articles in the Low Impact Factor Journals Corpus from the Lowest Impact Factor Journals to the Highest Impact Factor Journals

Coding	Year	IF (2014)	Name of Journal
L1	2013	0.181	European Journal of Orthopedic Surgery and Traumatology
L2	2014	0.583	Australia Journal of Forensic Sciences
L3	2013	0.705	International Ophthalmology
L4	2010	0.775	Genetics and Molecular Research
L5	2014	0.865	Biochemical Genetics
L6	2013	1.269	Experimental and Therapeutic Medicine
L7	2015	1.439	Journal of Microbiology
L8	2013	1.554	Molecular Medicine Report
L9	2014	1.656	Plant Molecular Biology Report
L10	2013	1.680	Cell Biochemistry and Biophysics
L11	2011	1.680	Cell Biochemistry and Biophysics
L12	2009	1.822	Seizure
L13	2014	1.855	Pathology and Oncology Research
L14	2009	1.855	Pathology and Oncology Research
L15	2012	1.880	Evidence-Based Complementary and Alternative Medicine

APPENDIX C

Research Articles in the High Impact Factor Journals Corpus

H1

Pan, L. L., Liu, X. H., Zheng, H. M., Yang, H. B., Gong, Q. H., & Zhu, Y. Z. (2012). S-propargyl-cysteine, a novel hydrogen sulfide-modulated agent, attenuated tumor necrosis factor-α-induced inflammatory signaling and dysfunction in endothelial cells. *International Journal of Cardiology*, *155*(2), 327-332.

H2

Ma, X. Y., Yu, J. T., Tan, M. S., Sun, F. R., Miao, D., & Tan, L. (2014). Missense variants in CR1 are associated with increased risk of Alzheimer' disease in Han Chinese. *Neurobiology of Aging*, *35*(2), 443.e17-443.e21.

H3

Zhang, C., Zhang, Z., & Li, G. (2014). Preparation of sulfonated graphene/polypyrrole solid-phase microextraction coating by in situ electrochemical polymerization for analysis of trace terpenes. *Journal of Chromatography A*, *1346*, 8-15.

H4

Yao, X. S., Diao, Y., Sun, W. B., Luo, J. M., Qin, M., & Tang, X. Y. (2007). Analysis of the CDR3 length repertoire and the diversity of TCR alpha chain in human peripheral blood T lymphocytes. *Cell Mol Immunol*, *4*(3), 215-220.

H5

Qin, A., Wen, Z., Zhou, Y., Li, Y., Li, Y., Luo, J., & Xu, L. (2013). MicroRNA□126 regulates the induction and function of CD4+ Foxp3+ regulatory T cells through PI3K/AKT pathway. *Journal of Cellular and Molecular Medicine*, *17*(2), 252-264.

H6

Chen, X., Wang, K., Wang, Z., Gan, C., He, P., Liang, Y., & Zhu, G. (2014). Effects of lead and cadmium co-exposure on bone mineral density in a Chinese population. *Bone*, *63*, 76-80.

H7

Yu, X. F., Deng, J., Yang, D. L., Gao, Y., Gong, Q. H., & Huang, X. N. (2011). Total Ginsenosides suppress the neointimal hyperplasia of rat carotid artery induced by balloon injury. *Vascular Pharmacology*, *54*(1), 52-57.

H8

Chen, X. P., Xun, K. L., Wu, Q., Zhang, T. T., Shi, J. S., & Du, G. H. (2007). Oxidized low density lipoprotein receptor-1 mediates oxidized low density lipoprotein-induced apoptosis in human umbilical vein endothelial cells: role of reactive oxygen species. *Vascular Pharmacology*, *47*(1), 1-9.

H9

Cao, S., Liu, Y., Sun, W., Zhao, L., Zhang, L., Liu, X., & Yu, T. (2015). Genome-Wide Expression Profiling of Anoxia/Reoxygenation in Rat

Cardiomyocytes Uncovers the Role of MitoK ATP in Energy Homeostasis. *Oxidative Medicine and Cellular Longevity, 2015.*

H10

Li, G., Fan, R. M., Chen, J. L., Wang, C. M., Zeng, Y. C., Han, C., & Yao, S. T. (2014). Neuroprotective effects of argatroban and C5a receptor antagonist (PMX53) following intracerebral haemorrhage. *Clinical & Experimental Immunology*, *175*(2), 285-295.

H11

Wang, Qation., Gong, Q., Wu, Q., & Shi, J. (2010). Neuroprotective effects of Dendrobium alkaloids on rat cortical neurons injured by oxygen-glucose deprivation and reperfusion. *Phytomedicine*, *17*(2), 108-115.

H12

Yang, S., Gong, Q., Wu, Q., Li, F., Lu, Y., & Shi, J. (2014). Alkaloids enriched extract from Dendrobium nobile Lindl. attenuates tau protein hyperphosphorylation and apoptosis induced by lipopolysaccharide in rat brain. *Phytomedicine*, *21*(5), 712-716.

H13

Guo, J., Li, F., Wu, Q., Gong, Q., Lu, Y., & Shi, J. (2010). Protective effects of icariin on brain dysfunction induced by lipopolysaccharide in rats.*Phytomedicine*, *17*(12), 950-955.

H14

Ou, S., Zhao, Y. D., Xiao, Z., Wen, H. Z., Cui, J., & Ruan, H. Z. (2011). Effect of lappaconitine on neuropathic pain mediated by P2X 3 receptor in rat dorsal root ganglion. *Neurochemistry International*, *58*(5), 564-573.

H15

Jin, H., Jin, F., Jin, J. X., Xu, J., Tao, T. T., Liu, J., & Huang, H. J. (2013). Protective effects of Ganoderma lucidum spore on cadmium hepatotoxicity in mice. *Food and Chemical Toxicology*, *52*, 171-175.

APPENDIX D

Research Articles in the Low Impact Factor Journals Corpus

L1

Xi, Y. M., Pan, M., Wang, Z. J., Zhang, G. Q., Shan, R., Liu, Y. J., & Hu, Y. G. (2013). Correction of post-traumatic thoracolumbar kyphosis using pedicle subtraction osteotomy. *European Journal of Orthopaedic Surgery &Traumatology*, *23*(1), 59-66.

L2

Zhang, K., Dong, X. A., Chen, X. G., Zhang, L., & Deng, Z. H. (2014). The ossification of the ischial tuberosity for forensic age diagnostics in conventional radiography. *Australian Journal of Forensic Sciences*, *46*(4), 455-462.

L3

Cai, S. J., Su, G., Li, H., Xie, B., & Luo, J. M. (2013). Profiling of human leukocyte antigens in Eales disease and tuberculosis. *International Ophthalmology*, *33*(5), 475-479.

L4

Li, D. B., Wei, X., Jiang, L. H., Wang, Y., & Xu, F. (2010). Meta-analysis of epidemiological studies of association of P53 codon 72 polymorphism with bladder cancer. *Genet Mol Res*, *9*(3), 1599-1605.

L5

Qian, G., Ping, J., Lu, J., Zhang, Z., Wang, L., & Xu, D. (2014). Construction of full-length cDNA library and development of EST-derived simple sequence repeat (EST-SSR) markers in Senecio scandens. *Biochemical Genetics*, *52*(11-12), 494-508.

L6

Xu, Z., Zhang, J., Lei, X., Xu, Z., Peng, Y., Yao, B., & Xu, P. (2013). Effects of valproate sodium on extracellular signal-regulated kinase 1/2 phosphorylation following hippocampal neuronal epileptiform discharge in rats. *Experimental and Therapeutic Medicine*, *6*(6), 1397-1401.

L7

Xu, H., Wang, L., Huang, J., Zhang, Y., Ma, F., Wang, J., & Wu, K. (2015). Pneumococcal wall teichoic acid is required for the pathogenesis of Streptococcus pneumoniae in murine models. *Journal of Microbiology*, *53*(2), 147-154.

L8

Liu, K. S., Fan, X. Q., Zhang, L., Wen, Q. N., Feng, J. H., Chen, F. C., ... & Sun, W. B. (2014). Effects of recombinant human interleukin-10 on Treg cells, IL-10 and TGF-β in transplantation of rabbit skin. *Molecular Medicine Reports*, *9*(2), 639-644.

L9

Yang, J. W., Fu, J. X., Li, J., Cheng, X. L., Li, F., Dong, J. F., ... & Zhuang, C. X. (2014). A Novel Co-immunoprecipitation Protocol Based on Protoplast Transient Gene Expression for Studying Protein–protein Interactions in Rice *Plant Molecular Biology Reporter*, *32*(1), 153-161.

L10

Shu, X. M., Zhang, G. P., Yang, B. Z., & Li, J. (2013). The Characterization of Childhood Occipital Epilepsy of Gastaut: A Study of Seven Patients. *Cell Biochemistry and Biophysics*, *67*(3), 991-995.

L11

Shu, X., Du, S., Chen, X., & Li, Z. (2011). Transplantation of neural stem cells overexpressing cardiotrophin-1 inhibits sprouting of hippocampal mossy fiber in a rat model of status epilepticus. *Cell Biochemistry and Biophysics*, *61*(2), 367-370.

L12

Xu, Z. C., Chen, Y. M., Xu, P., Liu, H., Xie, Y. L., & Zeng, K. B. (2009). Epileptiform discharge upregulates p-ERK1/2, growth-associated protein 43 and synaptophysin in cultured rat hippocampal neurons. *Seizure*, *18*(10), 680-685.

L13

Gou, X., Chen, H., Jin, F., Wu, W., Li, Y., Long, J., & He, Q. (2014). Expressions of CD147, MMP-2 and MMP-9 in laryngeal carcinoma and its correlation with poor prognosis. *Pathology & Oncology Research*, *20*(2), 475-481.

L14

Ren, T., Xu, L., Jiao, S., Wang, Y., Cai, Y., Liang, Y., & Wen, Z. (2009). TLR9 signaling promotes tumor progression of human lung cancer cell in vivo.*Pathology & Oncology Research*, *15*(4), 623-630.

L15

Huang, J., Li, L. S., Yang, D. L., Gong, Q. H., Deng, J., & Huang, X. N. (2012). Inhibitory effect of ginsenoside Rg1 on vascular smooth muscle cell proliferation induced by PDGF-BB is involved in nitric oxide formation.*Evidence-Based Complementary and Alternative Medicine*, *2012*.

APPENDIX E

THE RESULTS OF INTER-CODER RELIABILITY

Table 1 The Results of Inter-coder Reliability for the High Impact Factor Journals

Section	Move Boundaries	Agreement	Disagreement	Percentage of agreement
Abstract	20	19	1	95%
Introduction	26	21	5	80.77%
Methods	64	52	12	81.25%
Results	56	45	11	80.36%
Discussion	68	58	10	85.29%
Total	234	195	39	84.53%

Table 2 The Results of Inter-coder Reliability for the Low Impact Factor Journals

Section	Move Boundaries	Agreement	Disagreement	Percentage of agreement
Abstract	20	18	2	90%
Introduction	22	18	4	81.82%
Methods	60	49	11	81.67%
Results	34	30	4	88.24%
Discussion	58	49	9	84.48%
Total	194	164	30	85.24

APPENDIX F

THE RESULTS OF ABSTRACT OF THE PILOT STUDY

Table1 Moves of the Abstracts in HIF corpus

Coding	M1 B	M2 P	M3 M	M4 R	M5 C
AL1	1	1	/	1	1
AL2	1	1	1	1	1
AL3	/	1	1	1	1
AL4	1	1	/	1	1
AL5	1	1	1	1	1
Total Moves	4	5	3	5	5
Percentage	80%	100%	60%	100%	100%

Note:

1. M= move
2. AH= Abstract in high impact factor journal corpus
3. B=Background; P=Purpose; M=Methods; R=Results; C=Conclusion
4. HIF= high impact factor journal

Table 2 Moves of the Abstracts in LIF Corpus

Coding	M1 B	M2 P	M3 M	M4 R	M5 C
AH_1	1	1	1	1	1
AH_2	/	1	1	1	1
AH_3	/	1	1	1	1
AH_4	1	1	1	1	1
AH_5	1	1	1	1	1
Total Moves	3	5	5	5	5
Percentage	60%	100%	100%	100%	100%

Note:

1. M= move
2. AL= Abstract in low impact factor journal corpus
3. B=Background; P=Purpose; M=Methods; R=Results; C=Conclusion
4. LIF= low impact factor journal

Table 3 Move Patterns of the Abstracts

HIF Journal Corpus	LIF Journal Corpus
BPMRC	BPRC
PMRC	BPMRC
PRMC	PMRC
BPMRC	BPRC
BPMRMRC	BPMRC

Note:

1. HIF= high impact fact journal
2. LIF= low impact factor journal
3. B=Background; P=Purpose; M=Methods; R=Results; C=Conclusion

APPENDIX G

THE RESULTS OF IMRD OF THE PILOT STUDY

Move/Step	Frequency	
	HIF Journal Corpus (N=5)	**LIF Journal Corpus (N=5)**
The Introduction section	**5 (100%)**	**5 (100%)**
M 1 Presenting Background Information	5 (100%)	5 (100%)
S1 Reference to established knowledge in the field	1 (20%)	0
S2 Reference to main research problem		
	5（100%）	**5（100%）**
M 2 Reviewing Related Research	5 (100%)	5（100%）
S1 Reference to previous study	4 (80%)	3（60%）
S2 Reference to limitations of previous research	4 (80%)	2 (40%)
*S3 Generalizations from previous studies		
	5 (100%)	**5 (100%)**
M 3 Presenting New Research	4 (80%)	5 (100%)
S1 Reference to research purpose	2 (40%)	0
S2 Reference to main research procedure	2 (40%)	2（40%）
*S3 Presenting findings		
The Methods section		
M 4 Describing data collection procedure	**5 (100%)**	**5 (100%)**
*S1 Listing materials	4 (80%)	2 (40%)
S2 Source of data	5 (100%)	5 (100%)
*S3 Background of materials	1 (20%)	3（60%）
M 5 Describing experimental procedure	**5（100%）**	**5（100%）**
* S1 Documenting established procedures	5 (100%)	4（80%）
S2 Identifying main research apparatus	5 (100%)	5（100%）
S3 Recounting main research process	5 (100%)	5 (100%)
*S4 Providing background of procedures	5 (100%)	3 (60%)
***M 6 Presenting equations describing the phenomena or models of the phenomena.**	**2 (40%)**	**1 (20%)**

***M 7 Detailing statistical procedures**	**5 (100%)**	**5 (100%)**
The Results section		
M 8 Stating research procedures	**5 (100%)**	**4 (80%)**
***M 9 Justifying procedures or methodology**	**2 (40%)**	**1 (20%)**
M 10 Stating results	**5 (100%)**	**5 (100%)**
S1 Highlighting overall outcomes	3 (60%)	2 (40%)
S2 Stating a specific outcome	5 (100%)	5 (100%)
***M 11 Stating comments on the results**	**5 (100%)**	**3 (60%)**
S1Making generalizations or interpretations of the results	5 (100%)	3 (60%)
S2 Evaluating current findings with previous studies	2 (40%)	1 (20%)
The Discussion section		
***M 12 Contextualizing the study**	**5 (100%)**	**5 (100%)**
S1 Presenting background information about the study	5 (100%)	5 (100%)
S2 Detailing conclusions, claims, deductions or research gap based on analyses from previous studies	4 (80%)	3 (60%)
S3 Restating the aims of the study	2 (40%)	1 (20%)
M 13 Highlighting overall research outcome	**3 (60%)**	**3 (60%)**
M 14 Explaining specific outcomes	**5 (100%)**	**5 (100%)**
*S1 Restating the methodology	4 (80%)	3 (60%)
S2 Stating a specific outcome	5 (100%)	3 (60%)
S3 Making generalizations or interpretations	4 (80%)	4 (80%)
*S4 Evaluate current findings with previous studies	3 (60%)	4 (80%)
*S5 Stating the value of the study	3 (60%)	1 (20%)
S6 Limitation of the outcome	1 (20%)	4 (80%)
M 15 Stating research conclusions	**4 (80%)**	**5 (100%)**
S1 Indicating the research implication	3 (60%)	5 (100%)
S2 Promoting further research	2 (40%)	2 (40%)

APPENDIX H

THE FRAMEWRK OF KANOKSILAPATHAM (2005)

Move/Step	Frequency of Occurrence (%)
Introduction	
Move 1: Announcing the importance of the field	**100%**
Step 1: Claiming the centrality of the topic	
Step 2: Making topic generalizations	
Step 3: Reviewing previous research	
Move 2: Preparing for the present study	
Step 1: Indicating a gap	**66.66%**
Step 2: Raising a question	
Move 3: Introducing the present study	**100%**
Step 1: Stating purpose(s)	
Step 2: Describing procedures	
Step 3: Presenting findings	
Methods	
Move 4: Describing materials	**100%**
Step 1: Listing materials	
Step 2: Detailing the source of the materials	
Step 3: Providing the background of the materials	
Move 5: Describing experimental procedures	**100%**
Step 1: Documenting established procedures	
Step 2: Detailing procedures	
Step 3: Providing the background of the procedures	
Move 6: Detailing equipment (optional)	**10%**
Move 7: Describing statistical procedures (optional)	**13.32%**
Step 3: Referring to previous literature	
Step 4: Explaining differences in findings	
Step 5: Making overt claims or generalizations	
Step 6: Exemplifying	

APPENDIX H

THE FRAMEWRK OF KANOKSILAPATHAM (2005)

Move/Step	Frequency of Occurrence (%)
Results	
Move 8: Stating procedures	**71.59%**
Step 1: Describing aims and purposes	
Step 2: Stating research questions	
Step 3: Making hypotheses	
Step 4: Listing procedures or methodological techniques	
Move 9: Justifying procedures or methodology	**100%**
Step 1: Citing established knowledge of the procedure	
Step 2: Referring to previous research	
Move 10: Stating results	**91.01%**
Step 1: Substantiating results	
Step 2: Invalidating results	
Move 11: Stating comments on the results	**89.94%**
Step 1: Explaining the results	
Step 2: Making generalizations or interpretations of the results	
Step 3: Evaluating the current findings	
Step 4: Stating limitations	
Step 5: Summarizing	
Discussion	
Move 12: Contextualizing the study	**100%**
Step 1: Describing established knowledge	
Step 2: Presenting generalizations, claims, deductions, or research gaps	
Move 13: Consolidating results	**80%**
Step 1: Restating methodology (purposes, research questions, hypotheses restated, and procedures)	
Step 2: Stating selected findings	
Move 14: Stating limitations of the study	**53.33%**
Step 1: Limitations about the findings	
Step 2: Limitations about the methodology	
Step 3: Limitations about the claims made	
Move 15: Suggesting further research (optional)	**95.07%**

APPENDIX I

MOVES OF THE ABSTRACT IN THE HIF CORPUS AND THE LIF CORPUS

Move	Frequency of Occurrence	
	HIF Corpus N=15	LIF Corpus N=15
M1 (B)	11 (73.33%)	9 (60%)
M2 (P)	14 (93.33%)	14 (93.33%)
M3 (M)	14 (93.33%)	13 (86.67%)
M4 (R)	15 (100%)	15 (100%)
M5 (C)	15 (100%)	15 (100%)

Note:

1. M= move
2. B=Background; P=Purpose; M=Methods; R=Results; C=Conclusion
3. HIF= high impact factor journal
4. LIF= low impact factor journal

APPENDIX J

THE MOVE-STEP STRUCTURE OF ENGLISH MEDICAL SCIENCE RESEARCH ARTICLES WRITTEN BY CHINESE RESEARCHERS IN THE HIF CORPUS AND THE LIF CORPUS

Move/Step	Frequency of Occurrence	
	HIF Corpus N=15	LIF Corpus N=15
Introduction		
Move 1: Stating why the topic is worth investigating	**15 (100%)**	**15 (100%)**
Step 1: Claiming the importance of the topic	9 (60%)	7(46.67%)
Step 2: Making topic generalizations	15 (100%)	15(100%)
Step 3: Reviewing previous research	15 (100)	14 (93.33%)
*Step 4: Generalizations from previous studies	10 (66.67%)	3 (20%)
Move 2: Preparing for the present study	**12 (80%)**	**8 (53.33%)**
Step 1: Indicating a gap	12 (80)	6(40%)
Step 2: Raising a question	2 (13.33%)	2(13.33%)
Move 3: Introducing the present study	**15 (100%)**	**15 (100%)**
Step 1: Stating purpose(s)	14 (93.33%)	13 (86.67%)
Step 2: Describing procedures	6 (40%)	1 (6%)
Step 3: Presenting findings	4 (26.67%)	3(20%)
*Step 4: Stating the value of the present study	7(46.67%)	3(20%)
Methods		
Move 4: Describing materials	**15 (100%)**	**13 (86.67%)**
Step 1: Listing materials	7 (46.67%)	3 (20%)
Step 2: Detailing the source of the materials	15 (100%)	10 (66.67%)
Step 3: Providing the background of the materials	4 (26.67)	7 (46.67%)
Move 5: Describing experimental procedures	**15 (100%)**	**15 (100%)**
Step 1: Documenting established procedures	13 (86.67%)	8 (53.33%)
Step 2: Detailing procedures	15 (100%)	15 (100%)
Step 3: Providing the background of the procedures	10 (66.67%)	6 (40%)
Move 6: Detailing equipment	**13 (86.67%)**	**10 (66.67%)**
***Move 7: Presenting equations**	**3 (20%)**	**2 (13.33%)**
Move 8: Describing statistical procedures	**14 (93.33%)**	**12 (80%)**

Results		
Move 9: Stating procedures	**15 (100%)**	**12 (80%)**
Step 1: Describing purposes	8 (53.33%)	4 (26.67%)
Step 2: Listing procedures or methodological techniques	15 (100%)	11 (73.33%)
Move 10: Justifying procedures or methodology	**5 (33.33%)**	**4 (26.67%)**
Step 1: Citing established knowledge of the procedure	4 (26.67%)	3 (20%)
Step 2: Referring to previous research	2 (13.33%)	2 (13.33%)
Move 11: Stating results	**15 (100%)**	**15 (100%)**
Move 12: Stating comments on the results	**13 (86.67%)**	**8 (53.33%)**
Step 1: Making generalizations or interpretations of the results	12 (80%)	8 (53%)
Step 2: Evaluating the current findings	4 (26.67%)	1 (6%)
Step 3: Summarizing	6 (40%)	2(13.33%)
Discussion		
Move 13: Contextualizing the study	**15 (100%)**	**15 (100%)**
Step 1: Describing established knowledge	14(93.33%)	5 (33.33%)
Step 2: Presenting generalizations, claims, deductions, or research gaps	8 (53.33%)	7 (46.67%)
Step 3: Stating research aims	4 (26.67%)	3 (20%)
Move 14: Consolidating results	**15 (100%)**	**15 (100%)**
Step 1: Restating methodology (purposes, research questions, hypotheses restated, and procedures)	9 (60%)	5 (33.33%)
Step 2: Stating selected findings	15 (100%)	15 (100%)
Step 3: Evaluating current findings with previous studies	14 (93.33%)	9 (60%)
Step 4: Explaining differences in findings	4 (26.67%)	3 (20%)
Step 5: Making overt claims or generalizations	12 (80%)	12 (80%)
Step 6: Stating value of the present study	4 (26.67%)	3 (20%)
Move 15: Stating limitations of the study	**8 (53.33%)**	**3 (20%)**
Step 1: Limitations about the findings	4 (26.67%)	2 (13.33%)
Step 2: Limitations about the methodology	8(53.33%)	3 (20%)
Move 16: Stating research conclusions	**15 (100%)**	**14 (93.33%)**
Step 1: Implications	15 (100%)	14 (93.33%)
Step 2: Suggestions for further research	8 (53.33%)	8 (53.33%)

Note:

1. HIF= the high impact factor journal
2. LIF= the low impact factor journal
3. N=the total number of analyzed RA in this study
4. %= the frequency of occurrence of a move/step
5. * = new move or step
6. M= move; S= step

CURRICULUM VITAE

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