CHAPTER 1

INTRODUCTION

The objectives of the present study are to identify the rhetorical moves of Agricultural Science research articles (RAs) and to examine the possible lexical bundles in each move. This chapter provides an introduction and the background to the entire study. The background information includes the current problems, the rationale of the study, the purpose of the study including the research questions and the significance of the study. The scope and limitations of the study will be presented next. Finally, the key terms used in the present study are described.

1.1 Statement of the Problem

Grabe and Kaplan (1996) and Johns and Dudley-Evans (1991) indicated that English has acquired the status of an international language, especially for science and technology. Kanoksilapatham (2005) pointed out that RAs in English have become one of the main channels for advancing scientific knowledge among scholars worldwide. In the context of globalization and increasing international research collaboration, the ability to read and/or write RAs in English is crucial for academic and professional success in science and technology.

Getting published in an international peer-reviewed journal is a goal that is becoming more important for worldwide researchers from an early stage of their

career. Garfield (2000) stated that researchers are evaluated by the number and quality of their publications so they are under pressure to publish -----the so-called "publish or perish" law. Furthermore, they have to publish in English if they want their work to be accessible to the worldwide science community. According to Marušić and Marušić (2001), Native English Speaking (NES) researchers have a better chance of publishing their work in mainstream science journals than their non-native English speaking (NNES) peers from other, usually developing countries. A quarter of the world's well-known scientists come from developing countries (Gibbs, 1995), which contribute only 5% of the world's total investments in science. Science Citation Index (SCI) includes only 2% of journals from developing countries (Gibbs, 1995), and 90% of relevant information is published in only 10% of journals (Garfield, 1986). We can see that NNES researchers from developing countries have to strive to join their NES colleagues and publish in the international peer-reviewed journals. In this context, many feel disadvantaged where language is concerned. For example, Flowerdew (1999) interviewed Chinese scholars in Hong Kong and found out that they had less facility of expression because of limited vocabulary and that the Introduction section and the Discussion section of research articles are particularly difficult for them to write.

There has been an interest in the study of academic writing, too. One line of research has emphasized the discourse structure of academic text, such as, the individual sections of Introduction, Methods, Results and Discussion (IMRD) formats.

The other line of research has focused on specific linguistic features, such as noun phrases. Hyland and Tse (2007) stated that writing for academic purpose not only involves special knowledge of academic genres but also the academic language required by these genres. To some extent, a good writing performance is the control of multi-word expressions referred to as lexical bundles in this study. Hyland (2008) stated that lexical bundles are extended collocations which appear more frequently than expected by chance and can identify a different register. For example, the lexical bundles like *the protocol described previously*, *performed as described by*, help identify a text as belonging to an academic register, while *with regard to*, *in pursuance of*, and *in accordance with* are likely to be found in a legal text. The application of lexical bundles in writing not only identifies different registers but also the structure of articles. According to Swales (1990), lexical bundles indicate realizations of rhetorical moves in different IMRD sections of RAs in various disciplines. For example, lexical bundles like *play an important role*, *play a key role* indicate the realization of the Introduction section, while lexical bundles like *be derived from*, *in order to avoid*, indicate the realization of the Methods section.

But lexical bundles are different from simple expressions. Exposure through reading academic articles to lexical bundles does not automatically improve novice researchers or even experienced NNS researchers' writing performance in terms of the use of lexical bundles. Furthermore, when they occasionally use these expressions in their writing, the functions they try to realize may be different from those in published

writings. A possible reason for this difference might be a lack of formal instruction to novice researchers or inexperienced NNS researchers in the correct use of these expressions in their writing.

As a matter of fact, the study of lexical bundles not only helps students understand or read academic papers in English, but also aids researchers in getting their work published in international journals. As Eid and Jordan-Domschot (1989) show, students' language ability is also related to academic success.

But their language ability has also been identified as a common weakness in NES and NNES students' writing performance, so some researchers are interested in indentifying their common weaknesses. Sattayatham and Honsa. Jr (2007) carried out a study of first year students. The results showed that the most frequent errors were at the syntactic and lexical levels which led to overgeneralization, incomplete rule application, and building of false concepts. Chinnawong (2002) explored science undergraduates' writing performance and revealed that lexico-grammar is a major problematic area in addition to discourse organization and the development of ideas.

To summarize, writing is essential not only for scientists but also for science students. Scientists must not only "do" science, but must "write" science. Day and Bamford (1998) indicated that bad writing might delay the publication of good science. For English as a Foreign Language (EFL) students, the ability to write a good essay as a major vehicle of individual expression often exclusively determines a student's success in his or her area of study (Mitchell, 1994).

1.2 Rationale of the Study

Many researchers have focused on the study of academic genres, especially on genre structure and textual features. At one time, the discourse organization of academic text used to be taught as a uniform structure to students in English classes whatever their discipline backgrounds were. Zhu (2004) stated that there were some differences related to discourse structure and textual features within or across academic disciplines. Conrad (1996) highlighted variation in academic discourse based on corpus techniques to examine patterns and linguistic features in 100 passages of academic papers. Berkenkotter, Huckin and Ackerman (1991) argued that students need to use discipline-specific rhetorical and linguistic conventions to serve their purposes as writers.

The present study was motivated by the important role that Thailand's Agriculture plays in its economy and it was also prompted by the rising number of RAs published in English in the international discourse community.

Agriculture has been an important economic activity of Thailand with most of the population living in the rural areas and providing the benefits of employment and self-sufficiency. Thailand leads the world in producing and exporting rice, rubber, canned pineapples, and black tiger prawns. Also it leads the Asian region in exporting chicken meat and several other commodities; meanwhile, it seeks to expand its exports in livestock. Thailand will remain one of the world's major agricultural countries in social, environmental and economic terms for the foreseeable future.

Great importance has been attached to publishing research articles, as the main vehicle for transmitting scientific achievements (Swales, 1990; Brett, 1994; Holmes, 1997). The researchers in the field of Agriculture have to publish their RAs in English if they want to make the results of their work public. Furthermore, Kanoksilapatham's research (2005) indicated that RAs in English were used to advance scientific knowledge. But novice researchers in Agricultural Science have problems with getting published possibly because of their limited English. With this insight, the present study aims to analyze the structure of each IMRD section of Agricultural Science RAs and their lexical bundles, which link features and convey functional units, in order to help novice researchers, NNES researchers or student writers to read or write Agricultural Science RAs effectively.

1.3 Statement of the Purposes

This study aims to identify the rhetorical moves and examine the lexical bundles in each move in Agricultural Science RAs.

The following research questions serve as a guide in the study:

1) What are the overall rhetorical move structures in Agricultural Science Research Articles?

2) What are the most frequent lexical bundles in each move in Agricultural Science Research Articles?

1.4 Significance of the Study

The results of this study turn out to have some pedagogical implications in the following areas: development of a vocabulary handbook, which will facilitate reading and writing instruction in the Agricultural Science context.

Discipline variations give rise to the need to develop a discipline-specific academic wordlist, especially a list of lexical bundles self-sufficiency to meet the needs of novice or non-native English writers. Martinez, Beck and Panza (2009) identified only academic words in a corpus of RAs in Agriculture using Coxhead's (2000) Academic Word List. This study identified some lexical bundles useful for the expression of the rhetoric of Agricultural Science writing. Some students at the developmental level fail to succeed in academic writing partly because of their limited understanding of which word combinations to use or how to use them in an acceptable way or overuse of some formulaic sequences they have learnt. Levy (2003) stated that lexical bundles may help college writers by providing ready-made language that meets readers' expectations without need for further processing by the less proficient writer. So developing a receptive understanding of lexical bundles and rhetoric are helpful in facilitating reading and teaching writing in Agricultural Science.

1.5 Scope of the Study

1) This study has been carried out on the basis of lexical bundles which were identified from international peer-reviewed RAs in Agricultural Science.

2) Only research articles with the Introduction, Methods, Results and

Discussion sections (IMRD) selected from international peer-reviewed journals were examined.

1.6 Limitations of the Study

1) The lexical bundles identified in the present study must be extended collocations with at least 3 words, such as *be extracted from the*, *a significant difference between*, and *be designed from the*. I chose three as the lowest cut-off point in identifying lexical bundles because three-word lexical bundles can represent all the functional categories of bundles with more than three words

2) Native speakers might use other lexical bundles which were not identified or which could not be investigated in this study because all the lexical bundles are from Corpus of Agricultural Science Articles (CASA).

3) Corpus size is an important factor to reflect the representativeness of CASA and might influence the final result of the study. The size of CASA is 921,144 words. Therefore, some lexical bundles might not be identified or investigated in this study because of the limitations of the corpus size.

1.7 Definitions of Key Terms

Unless otherwise stated, the following terms used in the study have specific meanings as explained below:

1) **CASA** means the Corpus of Agricultural Science Articles compiled at Suranaree University of Technology. It consists of international peer-reviewed RAs in

Agricultural Science, including the sub-fields of Crop Production Technology, Food Technology and Animal Production Technology.

2) **Move** means a unit that relates to both the writer's purpose and the content that s/he wishes to communicate (Dudley-Evants & John, 1998, p.89).

3) **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 & John, 1998, p.89).

4) **Lexical Bundles** mean extended collocations, sequences of over 3 words in Agricultural Science writing, such as, *the results of*, *has been shown to* and *this would explain why*.

1.8 Summary

In conclusion, this chapter has presented the background, rationale and significance of the study. They are related to the purposes and research questions of this study which aims to identify the realization patterns of each move in CASA. This chapter also provides definitions of key terms and the scope and limitations of the study.